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ENVIRONMENTAL CONSULTING

10 October 1996
93333-B0

Mr. George Muehleck
Woodward-Clyde Consultant
500 12th Street, Suite 100
Oakland, CA 94607-4014

Subject: Groundwater Monitoring Event at the City of Oakland, Municipal Service Center, 7101 Edgewater Drive - August 1996

Dear Mr. Muehleck:

This letter documents the groundwater monitoring activities performed by BASELINE at the Municipal Service Center (MSC) in August 1996 (Figure 1). All field work was performed by BASELINE staff. Sampling procedures and analytical results are summarized below.

GROUNDWATER SAMPLING AND ANALYSES

Groundwater Sampling

Groundwater samples were collected from groundwater monitoring wells MW-1, MW-2, MW-5, MW-6, and MW-7 (Figure 2) on 27 August 1996. Sample bottles were provided by the analytical laboratory. Groundwater sampling forms are provided in Attachment A. Sampling procedures were performed as follows:

- Monitored vapor in well casing using an HNu instrument upon opening well cap.
- Measured product/water level and total depth of well from top of casing using dual-interface probe; decontaminated probe by washing in TSP solution and rinsing with DI water.
- Purged monitoring wells using double diaphragm pump and new disposable hose; the purge water was discharged into a 55-gallon drum.
- Measured temperature, pH, and conductivity of the purged water.
- Purged a minimum of 3.5 well volumes until parameters had stabilized.
- Collected groundwater samples using new disposable polyethylene bailers after the water level had recovered to at least 98 percent of original level, except at monitoring well MW-1. Monitoring well MW-1 pumped dry during purging. The water level had recovered to approximately 73% of the original water level prior to sample collection.
- Filled sample bottles for volatile organic analyses using volatile organic compound attachments to minimize turbulence and to prevent air bubbles; filled other sample bottles directly from bottom of bailer.
- Collected duplicate sample from MW-5 (labeled sample MW-5A).
- Submitted trip blank with samples (labeled MW-500).
- Stored labeled sample bottles in plastic cooler with blue ice; samples were picked up by Chromalab laboratory using chain-of-custody procedures.

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- Labeled and secured 55-gallon drums containing purge and decontamination water.

Petroleum odor was noted during purging of monitoring well MW-6. A coating of product was observed on the tubing and bailer used for MW-6 and a slight sheen was identified on the groundwater sample collected from that well.

Analytical Results

The analyses performed on each sample are summarized in Table 1. The samples were analyzed by Chromalab, Inc., a State-certified laboratory located in Pleasanton, California. A silica-gel cleanup on samples analyzed for petroleum hydrocarbons (MW-5, MW-5A, and MW-6) was performed. Analytical results for groundwater monitoring events performed from April 1995 to August 1996 are included in Tables 2 and 3. The laboratory report for this groundwater monitoring event is provided in Attachment B.

Groundwater Level Measurements

Groundwater level measurements were collected from monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, and MW-7 during groundwater sampling activities on 27 August 1996; measurements were collected within one-half hour during intermediate rising tide. The groundwater gradient was calculated to be 0.014 ft/ft at the northern portion of the site (MW-1 through MW-4), with a flow direction toward the northwest at approximately N12W. The groundwater flow gradient was calculated to be 0.004 ft/ft at the southern portion of the site (MW-5 through MW-7), with a flow direction toward the southwest at approximately S27W. The groundwater elevation data collected during the last four quarterly groundwater monitoring events (December 1995 to August 1996) are shown on Table 4. Groundwater contours for the 27 August 1996 event are shown on Figure 2.

Please contact us at your convenience if you have any questions regarding these groundwater monitoring activities or need additional information.

Sincerely,

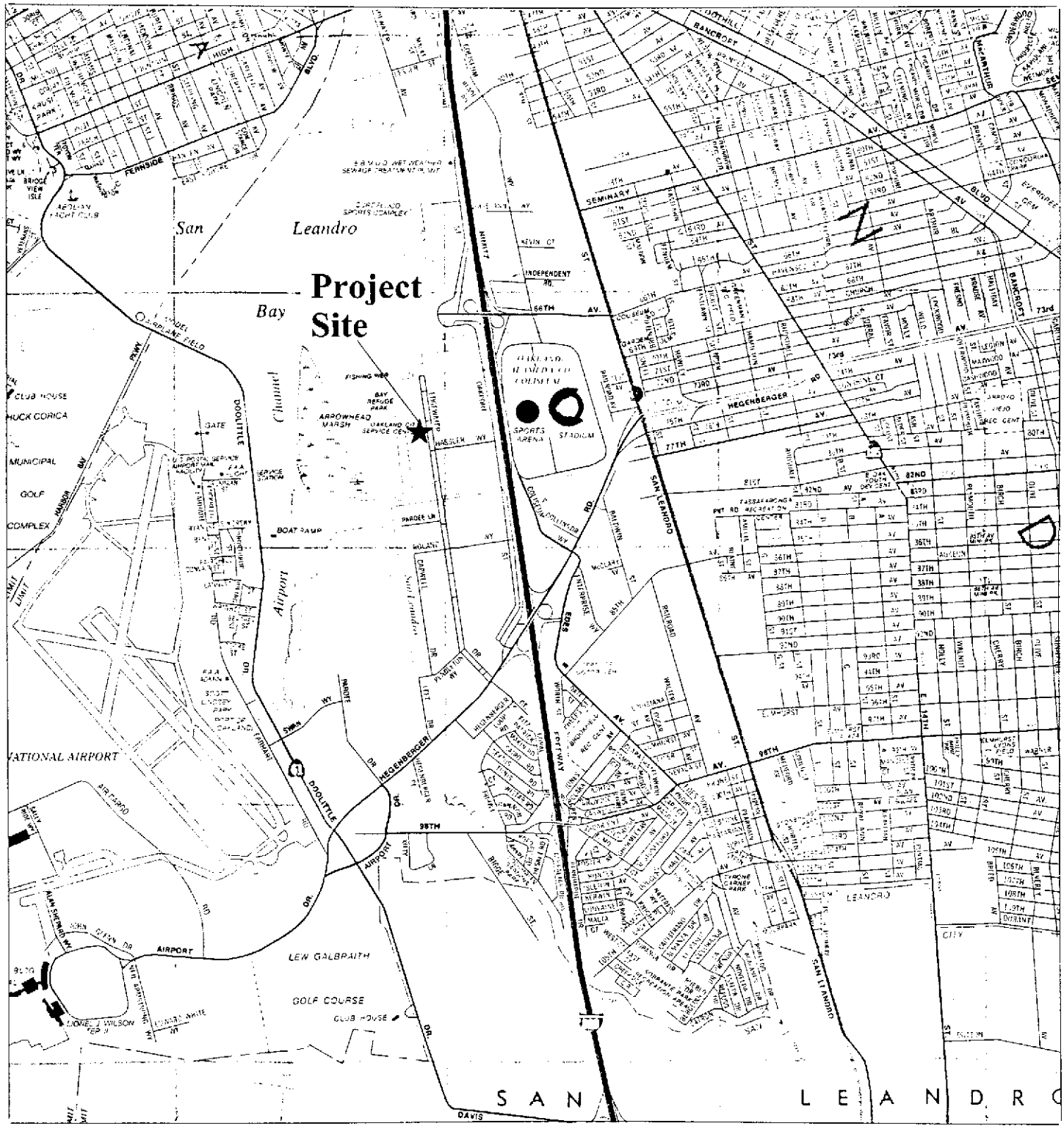
Mark Filippini
Senior Engineering Geologist
Cert. Eng. Geologist No. 1312

Rhodora Del Rosario
Civil Engineer

RPD:YN:tt
Attachments

REGIONAL LOCATION

Figure 1



0 3000 Feet

City of Oakland
Municipal Service Center
Oakland, California

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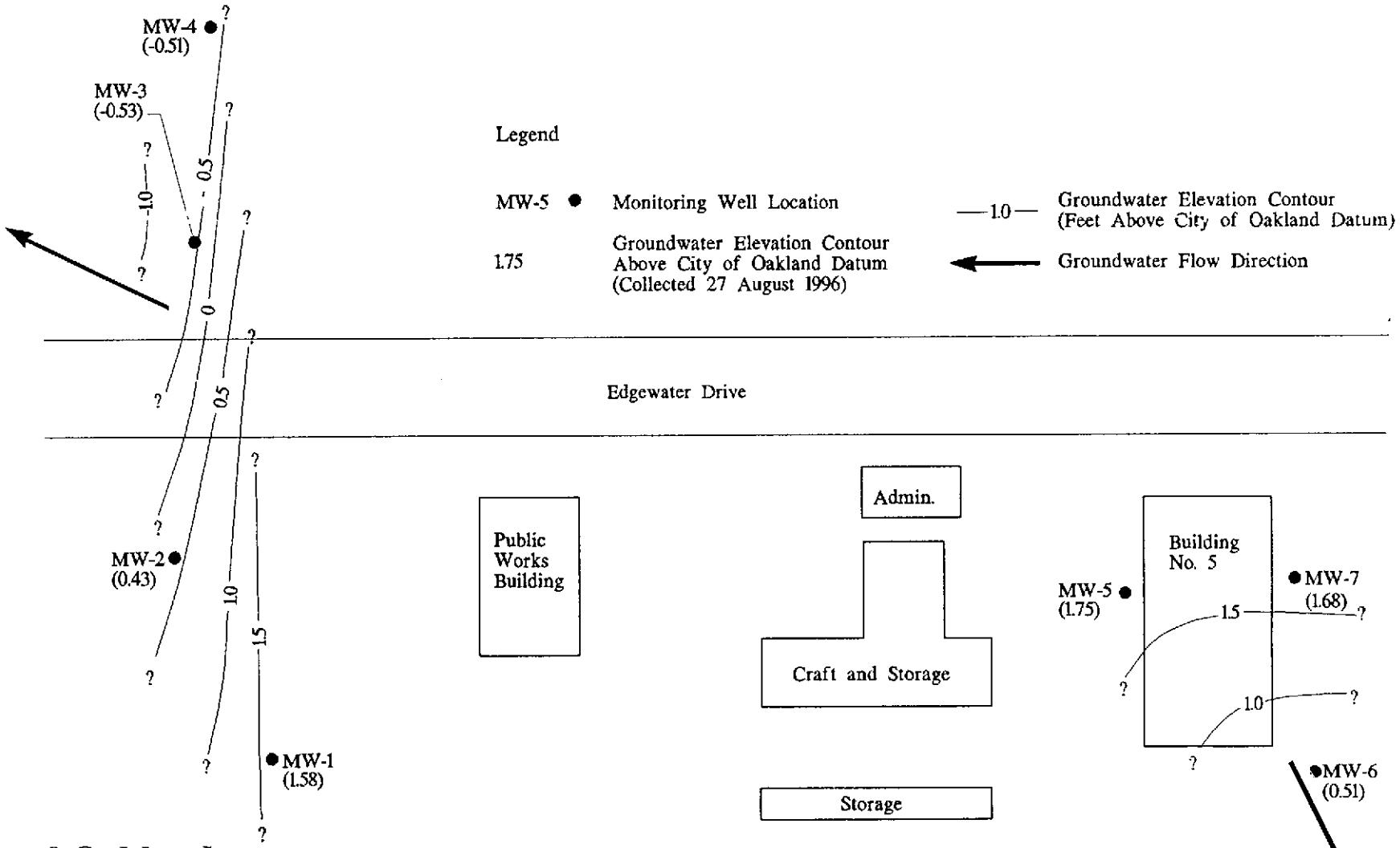
SITE LAYOUT AND GROUNDWATER ELEVATIONS

Figure 2



City of Oakland
Municipal Service Center
Oakland, California

Note: Tabulated groundwater elevation data shown on Table 4.

Source: City of Oakland, MSC Parking 6/27/74; Bates & Bailey Survey Maps, 7/14/95 and 11/21/95.

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TABLE 1

LABORATORY ANALYSES PERFORMED ON GROUNDWATER SAMPLES

Oakland Municipal Service Center

August 1996

Location	TOTAL PETROLEUM HYDROCARBONS				BTEX[2] (8020)	METALS[3]				
	Gasoline (5030/8015)	Diesel[1] (3510/8015)	Kerosene[1] (3510/8015)	Motor Oil[1] (3510/8015)		Cadmium (6010)	Chromium (6010)	Lead (6010)	Nickel (6010)	Zinc (6010)
MW-1	✓	--	--	--	✓	--	--	--	--	--
MW-2	--	--	--	--	✓	--	--	✓	--	--
MW-5	✓	✓	✓	✓	✓	--	--	--	--	✓
MW-5A[4]	✓	✓	✓	✓	✓	--	--	--	--	✓
MW-6	✓	✓	--	--	✓	✓	✓	✓	✓	✓
MW-7	--	--	--	--	✓	✓	✓	--	✓	✓
Trip Blank[5]	✓	--	--	--	✓	--	--	--	--	--

Notes: -- = Not analyzed.
Number shown in parenthesis indicates the EPA method used for analysis.

1 A silica gel cleanup (EPA Method 3630) was conducted prior to analysis.
2 BTEX = Benzene, toluene, ethylbenzene, and xylenes.
3 All samples for metals analyses were filtered in the laboratory.
4 Duplicate sample of MW-5.
5 Labeled MW-500 on chain-of-custody form.

TABLE 2
METAL CONCENTRATIONS, GROUNDWATER
Oakland Municipal Service Center
(mg/L)

Sample	Date	Cadmium	Chromium	Lead	Nickel	Zinc
MW-1	4/19/95	--	--	<0.01	--	--
	7/27/95	--	--	<0.01	--	--
	11/20/95	--	--	<0.01	--	--
	2/21/96	--	--	<0.01	--	--
MW-2	4/19/95	--	--	**0.10**	--	--
	7/27/95	--	--	**0.07**	--	--
	11/20/95	--	--	<0.01	--	--
	2/21/96	--	--	<0.01	--	--
	5/13/96	--	--	<0.005	--	--
	8/27/96	--	--	**0.47**[1]	--	--
MW-5	4/19/95	<0.005	<0.01	<0.01	<0.01	**0.02**
	7/27/95	<0.005	<0.01	<0.01	<0.01	<0.01
	11/20/95	<0.005	<0.01	<0.01	<0.01	<0.01
	2/21/96	<0.005	<0.01	<0.01	<0.01	<0.01
	5/13/96	--	--	--	--	<0.01
	8/27/96	--	--	--	--	<0.01
MW-5A	5/13/96	--	--	--	--	<0.01
	8/27/96	--	--	--	--	**0.01**
MW-6	4/19/95	--	--	**0.41**	--	--
	7/27/95	--	--	<0.01	--	--
	11/20/95	<0.005	<0.01	<0.01	**0.01**	**0.01**
	2/21/96	<0.005	<0.01	<0.01	**0.02**	<0.01
	5/13/96	<0.002	<0.005	<0.005	**0.016**	<0.01
	8/27/96	<0.002	<0.005	<0.005	**0.017**	**0.015**
MW-6A	4/19/95	--	--	**0.39**	--	--
	7/27/95	--	--	<0.01	--	--
	11/20/95	<0.005	<0.01	<0.01	**0.02**	<0.01
	2/21/96	<0.005	<0.01	<0.01	**0.02**	<0.01
MW-7	4/19/95	**0.069**	**0.071**	<0.01	**0.08**	**0.04**
	7/27/95	<0.005	<0.01	<0.01	**0.08**	**0.11**
	11/20/95	<0.005	<0.01	<0.01	**0.14**	**0.02**
	2/21/96	<0.005	<0.01	<0.01	**0.24**	**0.06**
	5/13/96	<0.002	<0.005	--	**0.12**	**0.015**
	8/27/96	<0.002	<0.005	--	**0.092**	**0.030**

Table 2 - *continued*

Notes: Groundwater samples were filtered by the laboratory prior to preservation and analysis, where indicated.
Analyzed by EPA method 6010.
<x.x = Metal not identified at or above the laboratory reporting limit of x.x.
x.x = Concentrations detected above laboratory reporting limit.
-- = No analyses performed.
MW-5A = Duplicate sample of MW-5.
MW-6A = Duplicate sample of MW-6.
Laboratory report is provided in Attachment B for the most recent sampling event.
Sampling locations are shown on Figure 2.

[1] Sample was erroneously filtered after preservation.

TABLE 3

PETROLEUM AND VOLATILE ORGANIC COMPOUND CONCENTRATIONS, GROUNDWATER

Oakland Municipal Service Center

(mg/L)

Sample	Date	TPH as Gasoline[1]	TPH as Kerosene[2]	TPH as Diesel[2]	TPH as Motor Oil[2]	TRPH[3]	Benzene[4]	Toluene[4]	Ethyl-benzene[4]	Xylenes[4]
MW-1	04/19/95	3.2	--	--	--	--	0.88	0.015	0.023	0.021
	07/27/95	0.98	--	--	--	--	0.13	0.0036	0.0014	0.0056
	11/20/95	0.40	--	--	--	--	0.099	0.0028	0.0011	0.0046
	02/21/96	1.7	--	--	--	--	0.34	0.0084	0.0053	0.016
	05/13/96[5]	7.3	--	--	--	--	2.0	0.03	0.042	0.038
	08/27/96	0.38	--	--	--	--	0.061	0.0024	<0.0005	0.0042
MW-2	04/19/95	<0.05	--	--	--	--	0.0018	<0.0005	<0.0005	<0.0005
	07/27/95	<0.05	--	--	--	--	0.0023	<0.0005	<0.0005	<0.0005
	11/20/95	<0.05	--	--	--	--	0.0022	<0.0005	<0.0005	<0.0005
	02/21/96	<0.05	--	--	--	--	0.0017	<0.0005	<0.0005	<0.0005
	05/13/96	--	--	--	--	--	0.002	<0.0005	<0.0005	<0.0005
	08/27/96	--	--	--	--	--	0.0024	<0.0005	<0.0005	<0.0005
MW-5	04/19/95	14	--	0.88[6]	--	4.7	0.49	0.051	0.61	1.2
	07/27/95	22	--	0.59[7]	--	5.0	1.3[8]	0.054[8]	1.5[8]	2.4[8]
	11/20/95	8.9	1.9[9]	<0.05	<0.5	--	0.43	0.031	0.61	0.88
	02/21/96	10	<0.05	0.48[10]	<0.5	--	0.54	0.065	0.7	0.97
	05/13/96[5,11]	5.9	<0.05	<0.05	<0.5	--	0.43	0.026	0.58	0.76
	08/27/96[11]	6.6	<0.051	2.0[15]	<0.51	--	0.43	0.027	0.6	0.65
MW-5A	05/13/96[5,11]	7.3	<0.05	<0.05	<0.5	--	0.36	0.022	0.49	0.64
	08/27/96[11]	6.3	<0.051	0.66[15]	<0.51	--	0.41	0.025	0.58	0.62
MW-6	04/19/95	5.7	--	6.7[6]	--	--	0.04	<0.0008	0.0039	0.029
	07/27/95	6.1	--	3.9	--	--	0.43	0.015	0.2	0.6
	11/20/95	6.8	--	0.85[12]	--	--	0.16	0.0046	0.008	0.24
	02/21/96	2.8	--	1.7[10]	--	--	0.23	0.0028	0.0038	0.044
	05/13/96[5,11]	3.1	<0.05	0.4[13]	<0.5	--	0.43	0.012	0.0052	0.067
	08/27/96	4.2	--	3.1[15]	--	--	0.3	0.0093	0.110	0.110
MW-6A	04/19/95	3.0	--	3.7[6]	--	--	0.31	0.0031	0.0027	0.1
	07/27/95	6.3	--	2.6	--	--	0.42	0.015	0.2	0.6
	11/20/95	3.6	--	0.83[12]	--	--	0.13	0.011	0.0044	0.2
	02/21/96	2.2	--	2.5[10]	--	--	0.28	0.003	0.004	0.046
MW-7	04/19/95	<0.05	--	<0.05	--	<1.0	<0.002	<0.002	<0.002	<0.002
	07/27/95	<0.05	--	<0.05	--	<1.0	<0.002[14]	<0.002[14]	<0.002[14]	<0.002[11]
	11/20/95	<0.05	--	<0.05	--	--	<0.0005	<0.0005	<0.0005	0.0015
	02/21/96	<0.05	--	<0.05	--	--	<0.0005	<0.0005	<0.0005	<0.0005
	05/13/96	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
	08/27/96	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
MW-500	04/19/95	<0.05	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
	07/27/95	<0.05	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
	11/20/95	<0.05	--	--	--	--	<0.0005	<0.0005	0.0005	<0.0005
	02/21/96	<0.05	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
	05/13/96[5]	<0.05	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
	08/27/96	<0.05	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005

Table 3, *continued*

Notes: TPH = Total Petroleum Hydrocarbons.
TRPH = Total Recoverable Petroleum Hydrocarbons.
-- = Compound not analyzed.
<x.x = Compound not identified at or above the laboratory reporting limit of x.x
x.x = Concentrations detected at or above laboratory reporting limit.
Laboratory report is provided in Attachment B for the most recent sampling event.
Sampling locations are shown on Figure 2.
MW-5A = Duplicate sample of MW-5.
MW-6A = Duplicate sample of MW-6.
MW-500 = Trip blank sample.

[1] Analyzed by EPA Method 5030/8015M.
[2] Analyzed by EPA Method 3510/8015M.
[3] Analyzed by EPA Method 418.1.
[4] Analyzed by EPA Method 8020.
[5] Head space was found in the VOA samples. Head space may be due to a chemical reaction between the HCl preservative and dissolved solids in water samples. However, the samples were analyzed within three days of sample collection.
[6] Laboratory report indicated sample chromatogram did not resemble chromatogram of any of the petroleum standards. Quantification listed in the table was based on the laboratory's diesel standard.
[7] Quantification listed in the table represents unknown hydrocarbon identified in the diesel range.
[8] This sample was also analyzed for volatile organic compounds using EPA Method 8240. Only BTEX was identified above the reporting limits.
[9] Quantification listed in the table represents unknown hydrocarbon identified in the kerosene range.
[10] Unknown hydrocarbons in the diesel range did not match any of the laboratory petroleum hydrocarbon standard profiles. Quantification in the table represents unknown hydrocarbons compared with the laboratory diesel standard. The unknown hydrocarbons may represent a combination of gasoline and weathered diesel or biogenic material.
[11] Samples were subjected to a silica gel cleanup prior to kerosene, diesel, and motor oil analyses by EPA Method 8015M.
[12] Unknown hydrocarbon in the kerosene range was identified by the laboratory. According to the laboratory, the quantified diesel value includes the unknown hydrocarbon identified in the kerosene range.
[13] Laboratory report indicated sample chromatogram did not resemble chromatogram of diesel standard. Quantification listed in table was based on laboratory's diesel standard.
[14] This sample was analyzed for volatile organic compounds using EPA Method 8240. No compounds were identified above the laboratory reporting limits.
[15] Laboratory report indicated hydrocarbon reported did not match laboratory standard for diesel pattern. Concentration was estimated due to overlapping fuel patterns and was reported as a diesel concentration. Quantification may include hydrocarbons in the gasoline range.

TABLE 4
GROUNDWATER ELEVATIONS
Oakland Municipal Service Center

Location	Date	Time	Tide	Depth to Water (feet bgs)	Top of Casing Elevation (feet above COD)	Water Surface Elevation (feet above COD)
MW-1	12/21/95	10:25	High	6.29	6.83	0.54
	12/21/95	17:21	Low	6.30		0.53
	2/21/96	8:45	IRT	4.62		2.21
	5/13/96	8:15	IRT	4.33		2.50
	8/27/96	9:46	IRT	5.25		1.58
MW-2	12/21/95	10:50	High	7.51	7.27	-0.24
	12/21/95	17:20	Low	7.48		-0.21
	2/21/96	8:10	IRT	6.68		0.59
	5/13/96	7:57	IRT	6.32		0.95
	8/27/96	9:32	IRT	6.84		0.43
MW-3	12/21/95	10:40	High	4.48	3.94	-0.54
	12/21/95	17:38	Low	4.62		-0.68
	2/21/96[1]	--	--	--		--
	5/13/96	8:05	IRT	2.98		0.96
	8/27/96	9:37	IRT	4.47		-0.53
MW-4	12/21/95	10:32	High	4.26	4.64	0.38
	12/21/95	17:32	Low	4.21		0.43
	2/21/96	8:08	IRT	0.31[2]		4.33
	5/13/96	8:07	IRT	3.87		0.77
	8/27/96	9:40	IRT	5.15		-0.51
MW-5	12/21/95	10:35	High	6.53	8.15	1.62
	12/21/95	17:26	Low	6.53		1.62
	2/21/96	8:31	IRT	5.97		2.18
	5/13/96	8:24	IRT	6.25		1.90
	8/27/96	9:53	IRT	6.40		1.75
MW-6	12/21/95	10:40	High	7.88	7.93	0.05
	12/21/95	17:36	Low	7.84		0.09
	2/21/96	13:30	IRT	7.40[3]		0.53
	5/13/96	8:27	IRT	7.10		0.83
	8/27/96	9:56	IRT	7.42		0.51
MW-7	12/21/95	10:50	High	6.94	8.48	1.54
	12/21/95	17:33	Low	6.90		1.58
	2/21/96	8:29	IRT	6.29		2.19
	5/13/96	8:20	IRT	6.95		1.53
	8/27/96	9:50	IRT	6.80		1.68

Notes: bgs = below ground surface
COD = City of Oakland Datum.
IRT = Intermediate Rising Tide.
Monitoring wells were surveyed by Bates & Bailey.

[1] Unable to collect water level reading because well box cover and vicinity were inundated with approximately four inches of surface water.
[2] Monitoring well cap was loose.
[3] Water level reflects second water level reading. The water level was steadily rising during the collection of the initial water level reading at 8:50 a.m. A water level depth of 7.62 feet bgs was measured at 8:50.

ATTACHMENT A

GROUNDWATER SAMPLING FORMS

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-1	Date:	8/27/96
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	15.8		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	6-15.8		
Recorded by:	TT/BB	TOC elevation (feet):	6.83 (City of Oakland Datum)		
Weather:	Sunny	Water level from TOC (feet):	5.25	Time:	9:46
Precip in past		Product level from TOC (feet):	None	Time:	9:46
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

gal/ft³

[(15.8 ft) - (5.25 ft)] × (0.083 ft)² × 3.14 × 7.48 = 1.7 gallons in one well volume
Well depth Water level Well radius

8.5 gallons in 5 well volumes

6.5 total gallons removed

r² π

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00/10.01	1,000
Before Purging:	10:15	21.2	7.00/10.01	950
After Purging:	13:10	23.4	6.97/9.19	950

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
10:57	24.4	6.58	10,000	1.0	Clear
11:03	23.8	6.64	7,000	3.0	Clear
11:08	23.8	6.66	8,000	5.0	Clear
11:14	23.9	6.65	8,000	6.5	Clear
WELL PUMPED DRY					

Pumping rate:	0.38 gpm			HNu reading in wellhead (ppm):	1
Water level after purging prior to sampling (feet):	7.16			Time:	14:00
Appearance of sample:	Clear			Time:	14:02
Duplicate/blank number:	--			Time:	--
Purge method:	Double diaphragm pump with new disposable hose				
Sampling equipment:	New disposable polyethylene bailer	VOC attachment:	Used for VOAs		
Sample containers:	2 40-ml VOAs				
Sample analyses:	TPH as gasoline, BTEX	Laboratory:	Chromalab		
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Marked drums on-site		

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GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-2	Date:	8/27/96
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	15.7		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	6-15.7		
Recorded by:	TT/BB	TOC elevation (feet):	7.27 (City of Oakland Datum)		
Weather:	Sunny	Water level from TOC (feet):	6.84	Time:	9:32
Precip in past		Product level from TOC (feet):	None	Time:	9:32
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(15.7 ft) - (6.84 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.4 gallons in one well volume
7.2 gallons in 5 well volumes
7.5 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00/10.01	1,000
Before Purging:	10:15	21.2	7.00/10.01	950
After Purging:	13:10	23.4	6.97/9.19	950

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
10:10	22.5	6.27	13,000	1.0	Slightly turbid
10:21	22.2	6.37	14,000	5.0	Very slightly turbid
10:25	21.9	6.33	14,000	6.0	Clear
10:28	21.5	6.36	14,000	7.5	Clear

Pumping rate:	0.42 gpm	HNu reading in wellhead (ppm):	0
Water level after purging prior to sampling (feet):	6.89	Time:	13:40
Appearance of sample:	Clear	Time:	13:42
Duplicate/blank number:	--	Time:	--
Purge method:	Double diaphragm pump with new disposable hose		
Sampling equipment:	New disposable polyethylene bailer	VOC attachment:	Used for VOAs
Sample containers:	2 40-ml VOAs; 1 250-ml plastic bottle		
Sample analyses:	BTEX, lead	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Marked drums on-site

BASELINE · 5900 Hollis Street, Suite D · Emeryville, CA 94608 · (510) 420-8686 · Fax (510) 420-1707

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-5	Date:	8/27/96
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	14.30 (measured)		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	4-14.30		
Recorded by:	TT/BB	TOC elevation (feet):	8.15 (City of Oakland Datum)		
Weather:	Sunny	Water level from TOC (feet):	6.40	Time:	9:53
Precip in past		Product level from TOC (feet):	None	Time:	9:53
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.3 ft) - (6.40 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.3 gallons in one well volume
6.4 gallons in 5 well volumes
6.5 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00/10.01	1,000
Before Purging:	10:15	21.2	7.00/10.01	950
After Purging:	13:10	23.4	6.97/9.19	950

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
11:21	24.7	6.63	13,000	1.0	Clear
11:25	24.1	6.60	7,000	3.0	Clear
11:32	24.2	6.46	7,000	5.0	Clear
11:36	24.2	6.45	7,000	6.5	Clear

Pumping rate:	0.43 gpm			HNu reading in wellhead (ppm):	6
Water level after purging prior to sampling (feet):	6.40			Time:	14:20
Appearance of sample:	Clear			Time:	14:23
Duplicate/blank number:	MW-5A (Duplicate)			Time:	14:23
Purge method:	Double diaphragm pump with new disposable hose				
Sampling equipment:	New disposable polyethylene bailer	VOC attachment:	Used for VOAs		
Sample containers:	4 40-ml VOAs; 2 1-liter amber glass bottles; 2 250-ml plastic bottles				
Sample analyses:	TPH-g, -d, -mo, -k; BTEX; zinc	Laboratory:	Chromalab		
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Marked drums on-site		

93333AUG.XLS (10/7/96)

GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-6	Date:	8/27/96
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	14.27		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	4-14.27		
Recorded by:	TT/BB	TOC elevation (feet):	7.93 (City of Oakland Datum)		
Weather:	Sunny	Water level from TOC (feet):	7.42	Time:	9:56
Precip in past		Product level from TOC (feet):	None*	Time:	9:56
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.27 ft) - (7.42 ft)] × (0.083 ft)² × 3.14 × 7.48 = 1.1 gallons in one well volume
Well depth Water level Well radius
5.5 gallons in 5 well volumes
5.0 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00/10.01	1,000
Before Purging:	10:15	21.2	7.00/10.01	950
After Purging:	13:10	23.4	6.97/9.19	950

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
12:52	22.3	7.34	4,000	1.0	Clear, petroleum odor
1:00	21.3	7.31	3,100	3.0	Clear, petroleum odor
1:06	20.7	7.30	3,000	5.0	Clear, petroleum odor

* Note: Product was observed on disposable tubing and bailer. Dual-interface probe did not indicate measurable thickness of product.

Pumping rate:	0.36 gpm	HNu reading in wellhead (ppm):	1
Water level after purging prior to sampling (feet):	7.58	Time:	14:45
Appearance of sample:	Clear with slight sheen	Time:	14:50
Duplicate/blank number:	--	Time:	--
Purge method:	Double diaphragm pump with new disposable hose		
Sampling equipment:	New disposable polyethylene bailer	VOC attachment:	Used for VOAs
Sample containers:	2 40-ml VOAs; 1 1-liter amber glass bottle; 1 250-ml plastic bottle		
Sample analyses:	TPH-gas & -diesel, BTEX, metals	Laboratory:	Chromalab
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Marked drums on-site

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GROUNDWATER SAMPLING

Project no.:	93333-BO	Well no.:	MW-7	Date:	8/27/96
Project name:	WWC-Oakland MSC	Depth of well from TOC (feet):	14.3 (measured)		
Location:	7101 Edgewater	Well diameter (inch):	2		
	Oakland, CA	Screened interval from TOC (feet):	4-14.3		
Recorded by:	TT/BB	TOC elevation (feet):	8.48 (City of Oakland Datum)		
Weather:	Sunny	Water level from TOC (feet):	6.80	Time:	9:50
Precip in past		Product level from TOC (feet):	None	Time:	9:50
5 days (inch):	0	Water level measurement:	Dual-interface probe		

VOLUME OF WATER TO BE REMOVED BEFORE SAMPLING:

[(14.3 ft) - (6.80 ft)] × (0.083 ft)² × 3.14 × 7.48 =
Well depth Water level Well radius

1.2 gallons in one well volume
6.1 gallons in 5 well volumes
5.0 total gallons removed

CALIBRATION:

	Time	Temp (° C)	pH	EC (µmho/cm)
Calibration Standard:			7.00/10.01	1,000
Before Purging:	10:15	21.2	7.00/10.01	950
After Purging:	13:10	23.4	6.97/9.19	950

FIELD MEASUREMENTS:

Time	Temp (° C)	pH	EC (µmho/cm)	Cumulative Gallons Removed	Appearance
12:14	26.8	6.15	16,000	1.0	Very slightly turbid
12:19	24.7	6.22	8,500	3.0	Clear
12:30	23.9	6.16	8,000	5.0	Clear

Pumping rate:	0.31 gpm			HNu reading in wellhead (ppm):	3
Water level after purging prior to sampling (feet):	6.85			Time:	14:32
Appearance of sample:	Clear			Time:	14:35
Duplicate/blank number:	--			Time:	--
Purge method:	Double diaphragm pump with new disposable hose				
Sampling equipment:	New disposable polyethylene bailer	VOC attachment:	Used for VOAs		
Sample containers:	2 VOAs; 1 250-ml plastic bottle				
Sample analyses:	BTEX, metals	Laboratory:	Chromalab		
Decontamination method:	TSP and water, DI water rinse	Rinsate disposal:	Marked drums on-site		

93333AUG.XLS (10/7/96)

ATTACHMENT B

LABORATORY REPORTS

CHROMALAB, INC.

Environmental Services (SDB)

August 29, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: 1 sample for Lead analysis.
Method: *EPA 3010A/6010*

Matrix: WATER *Extracted:* August 29, 1996
Sampled: August 27, 1996 *Run#:* 2895 *Analyzed:* August 29, 1996

Spl#	CLIENT SPL ID	LEAD (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
97748	MW-2	0.47	0.0050	N.D.	103	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 4, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: 2 samples for BTEX compounds analysis.
Method: *EPA 8020*

Matrix: WATER
Sampled: August 27, 1996 *Run#:* 2924 *Analyzed:* August 31, 1996

Spl#	CLIENT SPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
97752	MW-7	N.D.	N.D.	N.D.	N.D.

Matrix: WATER
Sampled: August 27, 1996 *Run#:* 2924 *Analyzed:* September 4, 1996

Spl#	CLIENT SPL ID	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
97748	MW-2	2.4	N.D.	N.D.	N.D.
	Reporting Limits	0.50	0.50	0.50	0.50
	Blank Result	N.D.	N.D.	N.D.	N.D.
	Blank Spike Result (%)	88.1	85.8	86.4	87.6

Marianne Alexander
Gas/BTEX Supervisor

Chip Poalinelli
Operations Manager

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(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 4, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: 5 samples for Gasoline and BTEX compounds analysis.
Method: *EPA 5030/8015M/8020*

Matrix: WATER
Sampled: August 27, 1996 *Run#:* 2882 *Analyzed:* August 29, 1996

Spl#	CLIENT SPL ID	Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
97747	MW-1	380	61	2.4	N.D.	4.2

Matrix: WATER
Sampled: August 27, 1996 *Run#:* 2916 *Analyzed:* August 30, 1996

Spl#	CLIENT SPL ID	Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
97749	MW-5	6600	430	27	600	650
97750	MW-5A	6300	410	25	580	620
97751	MW-6	4200	300	9.3	110	110

Matrix: WATER
Sampled: August 27, 1996 *Run#:* 2916 *Analyzed:* September 4, 1996

Spl#	CLIENT SPL ID	Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
97753	MW-500	N.D.	N.D.	N.D.	N.D.	N.D.
Reporting Limits		50	0.50	0.50	0.50	0.50
Blank Result		N.D.	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)		86.8	103	101	104	100

Marianne Alexander
Gas/BTEX Supervisor

Chip Poalinelli
Operations Manager

CHROMALAB, INC.

Environmental Services (SDB)

September 4, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: 1 sample for TPH - Diesel analysis.
Method: *EPA 3510/8015M*

Matrix: WATER *Extracted:* September 3, 1996
Sampled: August 27, 1996 *Run#:* 2956 *Analyzed:* September 4, 1996

Spl#	CLIENT SPL ID	DIESEL (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
97751	MW-6	3100	51	N.D.	83.5	1

Note: Hydrocarbon reported does not match the pattern of our Diesel standard. Estimated concentration due to overlapping fuel patterns. Silica gel cleanup.

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

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(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 4, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: 2 samples for TEPH analysis.
Method: *EPA 3550/8015M*

Matrix: WATER *Extracted:* September 3, 1996
Sampled: August 27, 1996 *Run#:* 2956 *Analyzed:* September 4, 1996

Spl#	CLIENT SPL ID	Kerosene (ug/L)	Diesel (ug/L)	Motor Oil (ug/L)
97749	MW-5	N.D.	2000	N.D.
	Note: Hydrocarbon reported does not match the pattern of our Diesel standard. Estimated concentration due to overlapping fuel patterns. Silica gel cleanup.			
97750	MW-5A	N.D.	660	N.D.
	Note: Hydrocarbon reported does not match the pattern of our Diesel standard. Estimated concentration due to overlapping fuel patterns. Silica gel cleanup.			
Reporting Limits		51	51	510
Blank Result		N.D.	N.D.	N.D.
Blank Spike Result (%)		--	83.5	--

Bruce Havlik
Chemist

Alex Tam
Semivolatiles Supervisor

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 5, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: One sample for Soluble Miscellaneous Metals analysis.
Method: *EPA 3005A/6010A*

Client Sample ID: **MW-5**
Spl#: 97749 *Matrix:* WATER *Extracted:* September 3, 1996
Sampled: August 27, 1996 *Run#:* 2944 *Analyzed:* September 4, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
ZINC	N.D.	0.010	N.D.	105	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

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CHROMALAB, INC.

Environmental Services (SDB)

September 5, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: One sample for Soluble Miscellaneous Metals analysis.
Method: *EPA 3005A/6010A*

Client Sample ID: **MW-5A**
Spl#: 97750 *Matrix:* WATER *Extracted:* September 3, 1996
Sampled: August 27, 1996 *Run#:* 2944 *Analyzed:* September 4, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
ZINC	0.010	0.010	N.D.	105	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

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CHROMALAB, INC.

Environmental Services (SDB)

September 5, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: One sample for Soluble Miscellaneous Metals analysis.
Method: *EPA 3005A/6010A*

Client Sample ID: **MW-6**
Spl#: 97751 *Matrix:* WATER *Extracted:* September 3, 1996
Sampled: August 27, 1996 *Run#:* 2944 *Analyzed:* September 4, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
CADMIUM	N.D.	0.0020	N.D.	105	1
CHROMIUM	N.D.	0.0050	N.D.	103	1
LEAD	N.D.	0.0050	N.D.	105	1
NICKEL	0.017	0.0050	N.D.	104	1
ZINC	0.015	0.010	N.D.	105	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

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CHROMALAB, INC.

Environmental Services (SDB)

September 5, 1996 *Submission #:* 9608361

BASELINE ENVIRONMENTAL/EMRYVL

Atten: Rhodora Del Rosario

Project: MSC,7101 EDGEWATER DR,OAK *Project#:* 93333-BO
Received: August 27, 1996

re: One sample for Soluble Miscellaneous Metals analysis.
Method: *EPA 3005A/6010A*

Client Sample ID: **MW-7**
Spl#: 97752 *Matrix:* WATER *Extracted:* September 3, 1996
Sampled: August 27, 1996 *Run#:* 2944 *Analyzed:* September 4, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
CADMIUM	N.D.	0.0020	N.D.	105	1
CHROMIUM	N.D.	0.0050	N.D.	103	1
NICKEL	0.092	0.0050	N.D.	104	1
ZINC	0.030	0.010	N.D.	105	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

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Federal ID #68-0140157

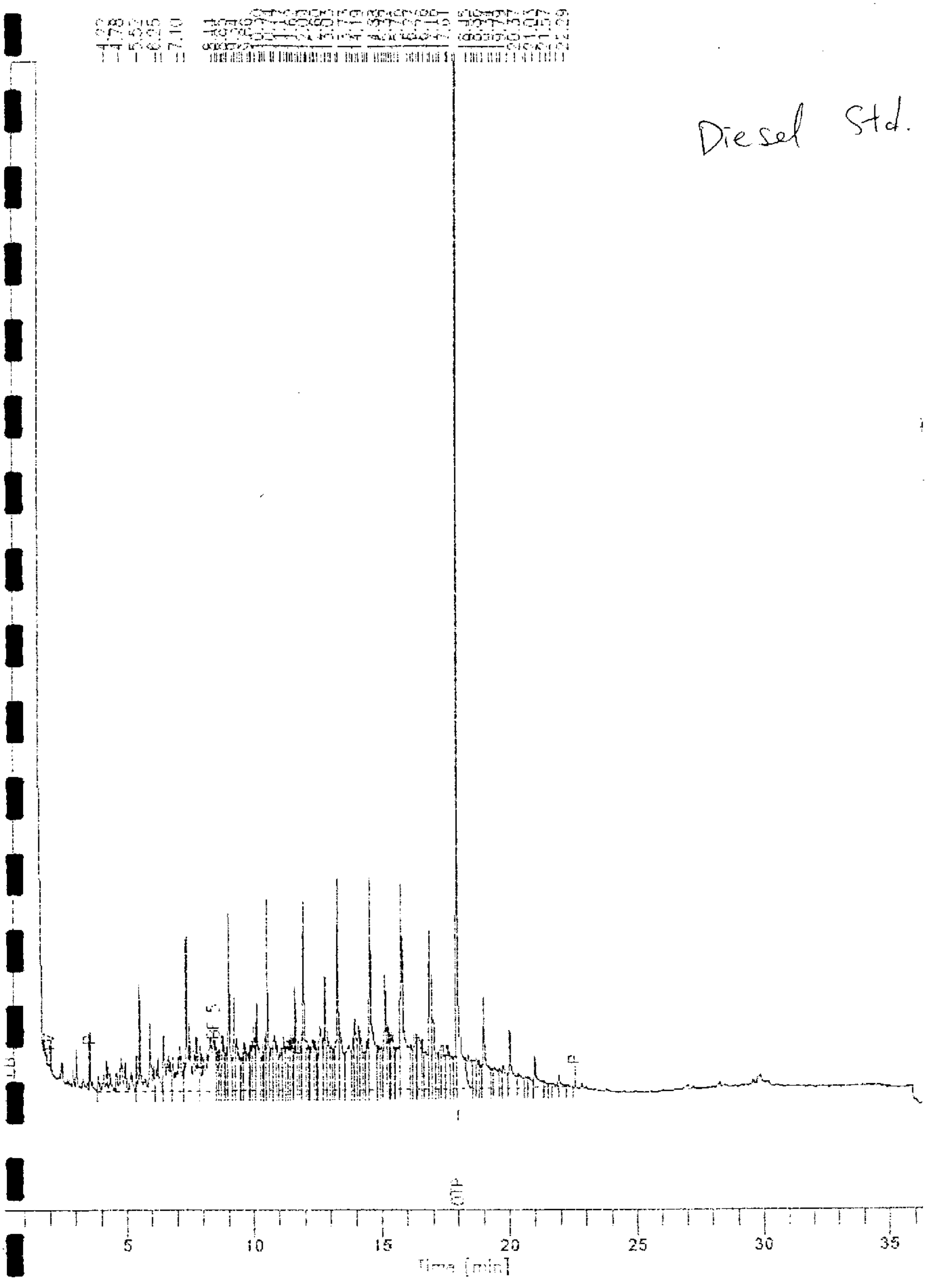
diesel analysis

DIESEL 250PPM
d:\6000DIES\2963002.raw
E39-24
0 min
0.0

End Time : 36.33 min
Plot Offset: 0 mV

Sample #: 601297
Date : 9/3/96 10:18
Time of Injection: 9/3/96 09:42
Low Point : 0.00 mV
Plot Scale: 1000.0 mV

High Point : 1000.00 mV



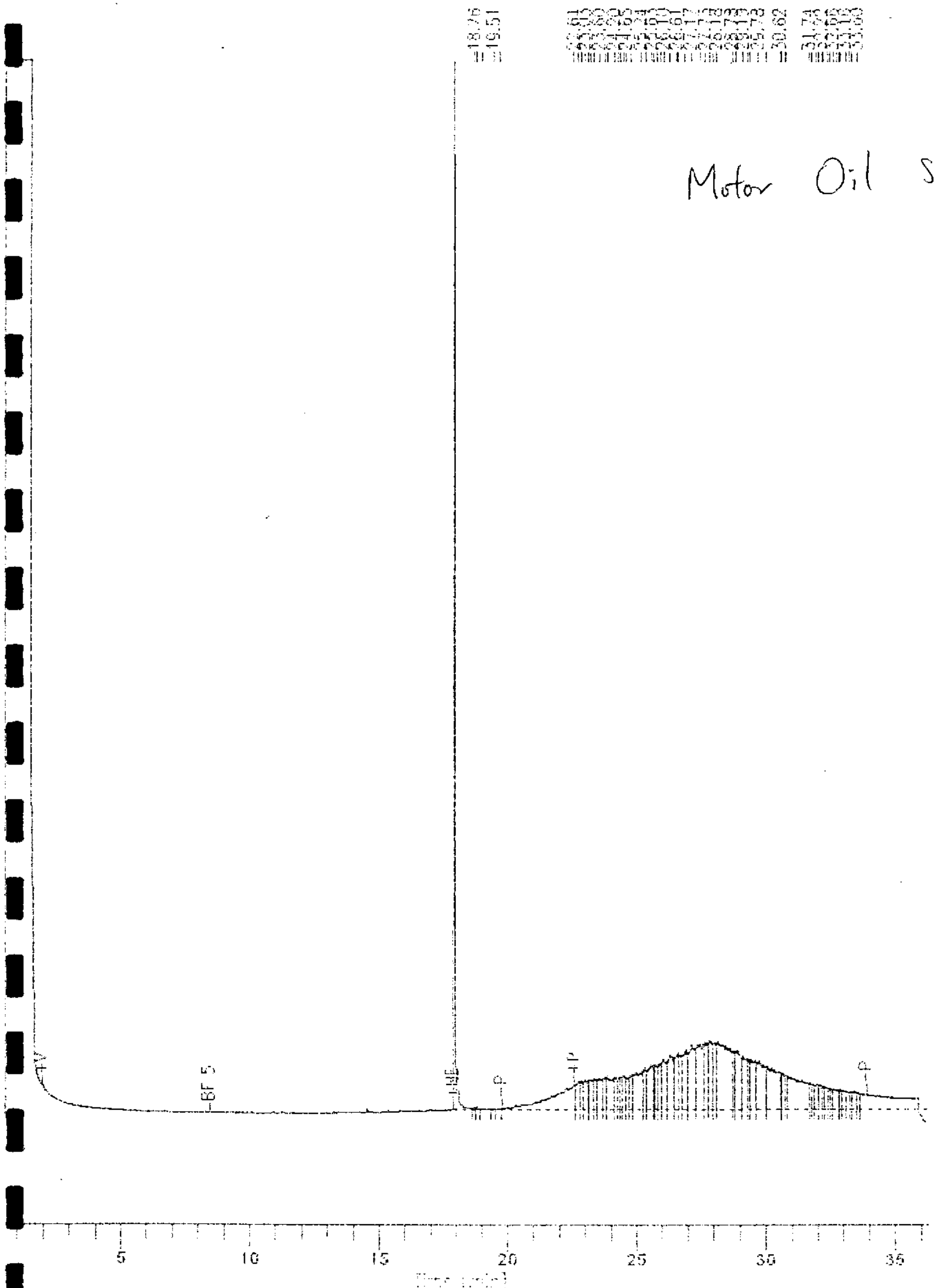
MOTOR OIL ANALYSIS

350PPM
...0000DIES\3903003.raw
M024-35
0 min
.0

End Time : 36.33 min
Plot Offset: 0 mV

Sample #: 401292
Date : 9/3/96 11:03
Time of Injection: 9/3/96 10:27
Low Point : 0.00 mV
Plot Scale: 1000.0 mV

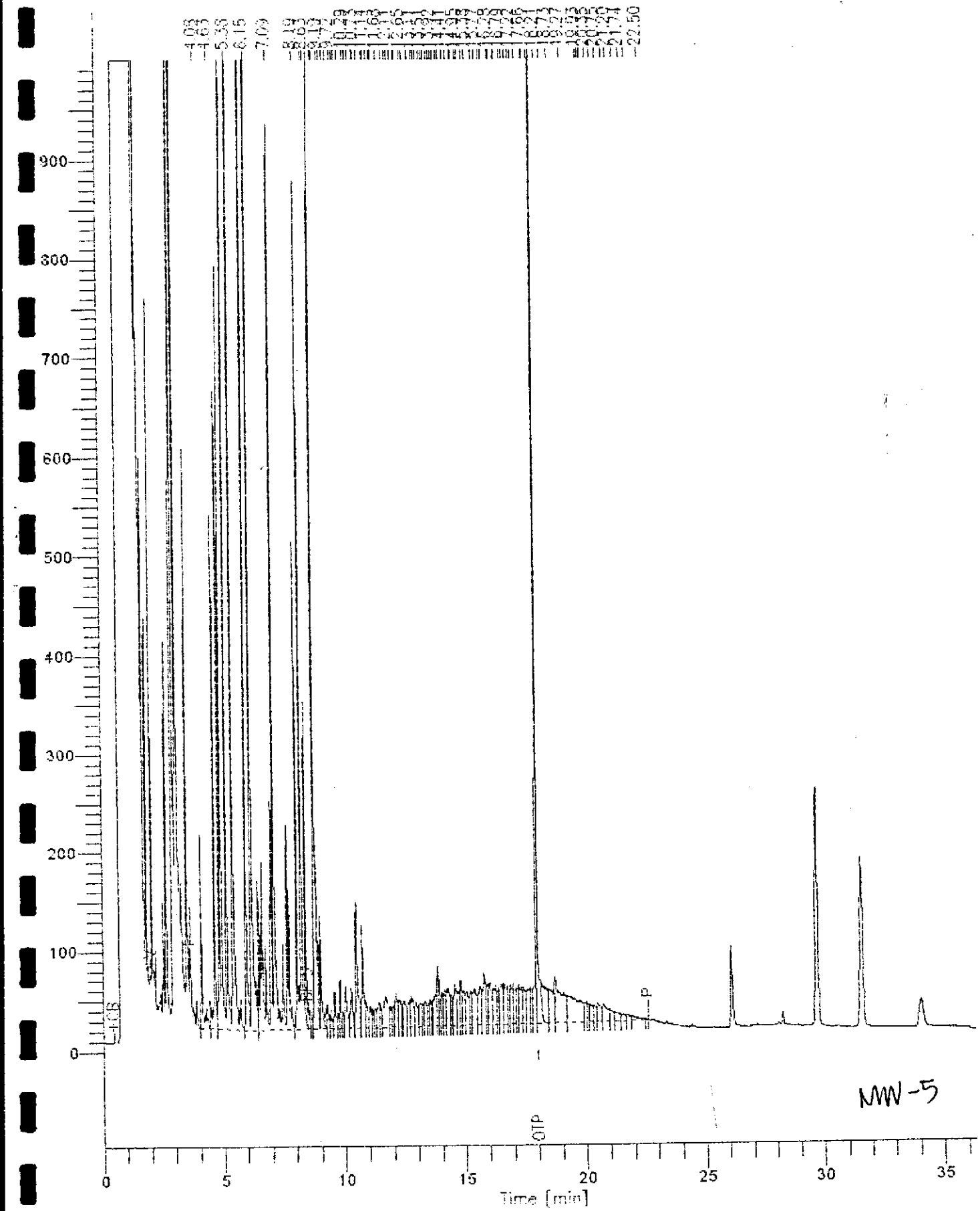
High Point : 1000.00 mV



diesel analysis

ple Name : 8261/MW5 W/
Name : D:\6000DATA\8903019.raw
: SDI29-21
Time : 0.00 min End Time : 36.33 min
Factor: 0.0 Plot Offset: 0 mV

Sample #: 97749 Page 1 of 1
Date : 9/4/96 01:46
Time of Injection: 9/4/96 01:09
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000.0 mV

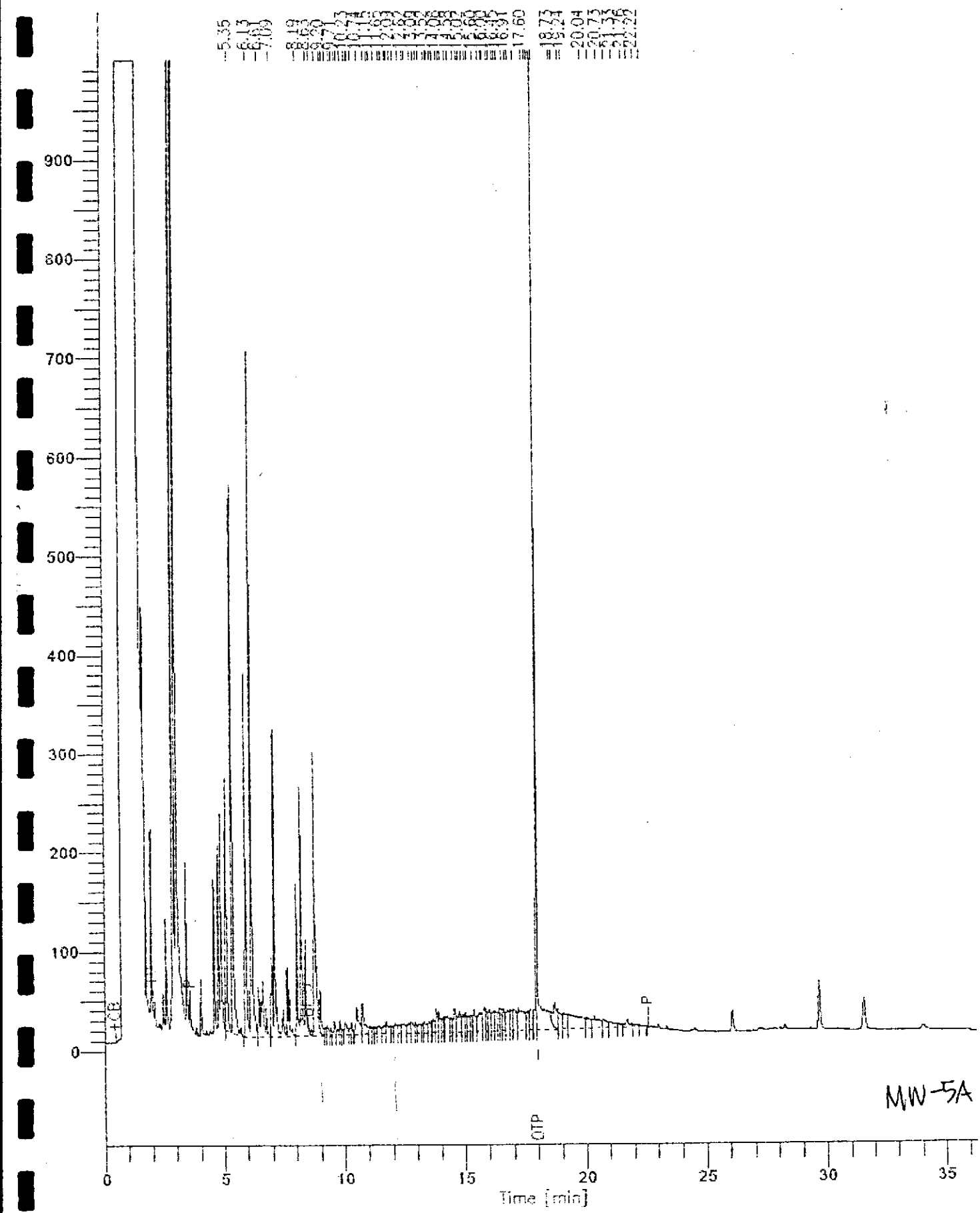


MW-5

diesel analysis

mple Name : 8361/MWSA @/
leName : D:\6000DIES\3903020.raw
d : SHS89-24
Time : 0.00 min End Time : 26.33 min
Factor: 0.0 Plot Offset: 0 mV

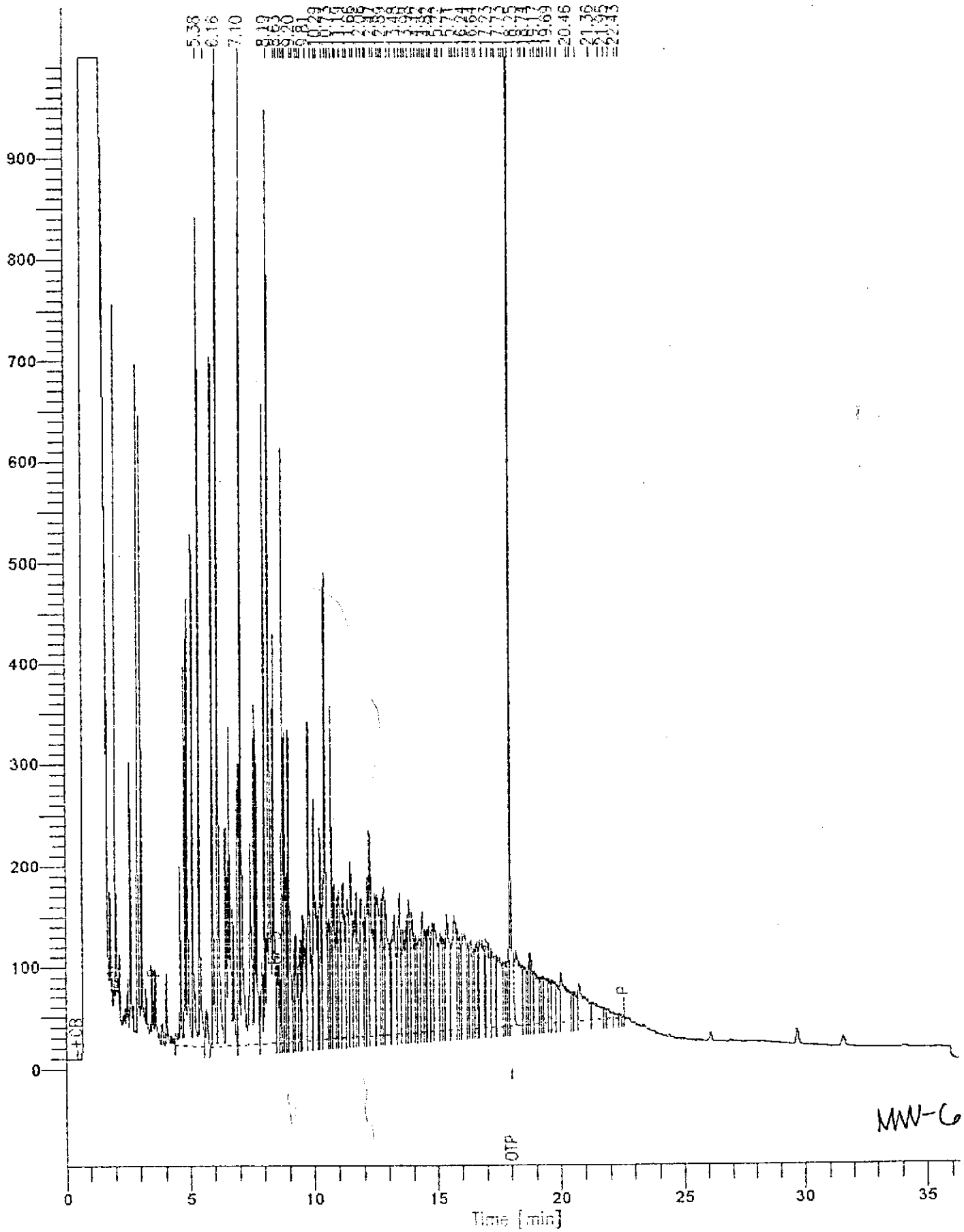
Sample #: 97750
Date : 9/4/96 02:30
Time of Injection: 9/4/96 01:54
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000.0 mV



diesel analysis

Sample Name : 8361/MW6 CLEANUP
FileName : D:\6000DIES\S904004.raw
Method : SDIS9-24
Start Time : 0.00 min End Time : 36.33 min
Scale Factor: 0.0 Plot Offset: 0 mV

Sample #: 97751 Page 1 of 1
Date : 9/4/96 12:48
Time of Injection: 9/4/96 12:11
Low Point : 0.00 mV High Point : 1000.00 mV
Plot Scale: 1000.0 mV



CHROMALAB

Change request received by: Mike V.

Date Requested: 8/28/96

SAMPLE STATUS CHANGE FORM

Submission#	Client Samp.ID	Old Status Description	Description of Changes	Requested by (Client's name)
9608361	MW-2 MW-5 MW-5A MW-6 MW-7	TOTAL MISC METALS All waters have been lab filtered	Run MW-2 : Total Misc Metals All others : Soluble Misc Metals	BASELINE

Changes were done in lims by(login): Mimie On: 8/28/96

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

CHROMALAB, INC.
SAMPLE RECEIPT CHECKLIST

Client Name BASELINE — Date/Time Received 8/27/96 (Date) 1535 (Time)

Project MSC, 7101 EDGEWATER DR., Oakland — Received by Jeff Lindberg

Reference/Subm # 29427 / 9608361 — Carrier name

Checklist completed by: Mimi Pak (Signature) 8/28/96 (Date) — Logged in by MP (Initials) 8/27/96 (Date)

Matrix Water

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? 8.2

pH upon receipt 2-7 pH adjusted Yes Check performed by: MP NA

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

Client contacted? Yes — Date contacted? 8/27 & 8/28/96

Person contacted? Rhodora Del Rosario — Contacted by? M. Pak & Mike Verona

Regarding? Metals samples to be analyzed for Total or Soluble tests.

Comments: Unpreserved samples were received at pH 7. Water Samples for metals analysis were filtered & preserved by the analyst to pH ≤ 2. Samples for Diesel / TEPH were adjusted to pH 2 and VOA pH will be checked by analyst.

Corrective Action:

SMPLRECD.CK

361/97747-97753 | 29427

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

CHAIN OF CUSTODY RECORD

Turn-around Time: Standard 5day
Lab: Chromalab
BASELINE Contact Person: Rhodora Del Rosario

Project No.: 93333-BO

Project Name and Location: MSC, 7101 Edgewater Drive, Oakland

Samplers: (Signature) [signature] Todd [signature]

Sample ID No. Station	Date	Time (BB 2:02 PM)	Media	Depth	No. of Containers	Gas/BTEX	BTEX	Diesel	Kerosene, Motor Oil	Lead (6010)	Zinc (6010)	Cadmium, Cr, Ni (6010)	Silica Gel (3630) See Note 1	Remarks/ Composite	Detection Limits
MW-1	8/27/96	~~4:42~~ pm	WATER	—	2	X									
MW-2	8/27/96	1:42 PM	WATER	—	3		X			X					
MW-5	8/27/96	2:23 PM	"	—	4	X		X	X		X		X		
MW-5A	8/27/96	2:23 PM	"	—	4	X		X	X		X		X		
MW-6	8/27/96	2:50 PM	"	—	4	X		X		X	X	X	X		
MW-7	8/27/96	2:35 PM	"	—	3		X				X	X			
MW-500	8/27/96	8:30 AM	"	—	2	X									

SUBN #: 9608361 REP: MV
CLIENT: BASE
DUE: 09/04/96
REF #:29427

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Date / Time
[signature]	8/27/96 3:35 PM	[signature]	8-27-96 1535
[signature]	8/27/96 1705	[signature]	8/27/96 1705

Conditions of Samples Upon Arrival at Laboratory:

Remarks: Notes
① Perform silica gel cleanup on samples to be analyzed for diesel, motor oil and kerosene.
② Filter samples to be analyzed for metals
③ Provide chromatograms & Standards ④ Bill Invoice to Woodward-Clyde

CCSTRCDE.FM2 ADMIN(AD4):5/27/92