

# Aquatic & Environmental Applications

ENVIRONMENTAL  
PROTECTION

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July 10, 1998

**REF: 1004-2Q.98**

Mr. Barney Chan  
Environmental Health  
Alameda County  
1131 Harbor Bay Pkwy  
Alameda, CA 94502-6577

**SUBJECT: QUARTERLY MONITORING REPORT MOTOR PARTNERS,  
1234 40TH AVE., OAKLAND, CA**

Dear Barney:

I have enclosed a copy of the Quarterly Monitoring report prepared for the Motor Partners site, 1234 40th Ave., Oakland, California. Groundwater sampling results are presented for the second quarterly monitoring event in 1998. The results of sampling indicate that hydrocarbon contamination is present in groundwater samples from all five wells. Concentrations of hydrocarbons are in the same range as those of the previous monitoring period.

Samples were also collected from each of the wells for analysis of dissolved oxygen, redox, nitrate, sulfate, iron, total phosphorus, and ammonia. We are still awaiting approval from the State Fund before proceeding with ORC treatment to enhance natural bioremediation processes at the site.

If you have any questions or comments regarding the report, please give me a call.

Sincerely,

*Mary Rogers*

Gary Rogers, Ph.D.

cc: Bill Owens

*The OR? is 2.2. The total  
of 1.5 mg/l is not high. The  
1,3,4,5 could benefit from  
at least 1.5 mg/l of ORC.*

**QUARTERLY MONITORING REPORT**  
2nd Quarter, 1998

**PROJECT SITE:**

**MOTOR PARTNERS**  
1234 40TH AVE., OAKLAND, CALIFORNIA  
StID #3682

**PREPARED FOR:**

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**PROJECT NO. 1004.95**

July 10, 1998

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## INTRODUCTION

### PROJECT DESCRIPTION

This report discusses the results of quarterly sampling for the second quarter in 1998 at the Motor Partners site, 1234 40th Ave., Oakland, California.

### SITE LOCATION AND DESCRIPTION

The project site is known as Motor Partners, 1234 40th Avenue, Oakland, California (Figure 1), located in a commercial/light industrial area. The elevation of the site is approximately 30 feet above mean sea level.

Motor Partners is located at 1234 40th Avenue near Nimitz Highway (880) in the Fruitvale District of Oakland, California (Figure 1). The BART rail tracks are about 500 feet west of the site and San Leandro Bay is less than one mile to the southwest.

Motor Partners utilized the site for auto repair shops. Two underground storage tanks were maintained outside the 1234 40th Avenue building. A 1,000-gallon underground gasoline tank and a 500-gallon underground waste oil tank were located below the sidewalk (Figure 2). No reliable records exist to determine if inventory was lost.

### Previous Subsurface Investigations

On Oct. 12, 1990, Semco, Inc. of Modesto, California removed both the 1,000-gallon gasoline tank and the 500-gallon waste oil tank. The concentration of total petroleum hydrocarbons in the gasoline range (TPH-G) below the 1,000-gallon tank was 1,600 mg/Kg. The TPH-G and TPH-D concentrations below the 500-gallon tank were 570 mg/Kg and 650 mg/Kg, respectively. There was no record of groundwater in the excavations. The excavations were backfilled to grade with original spoils.

In January, 1994, SEMCO re-excavated the area to remove contaminated soil, and dispose of the contaminated backfill. During the course of over excavation, it was noted that contamination extended beneath the building and into the street. Utilities prevented further excavation. The over excavation was halted and samples taken from the sidewalls of each excavation. An extraction well casing was installed in each excavation. Clean imported soil was used to backfill the two areas and the sidewalk was resurfaced with Christy boxes housing the two extraction casings.

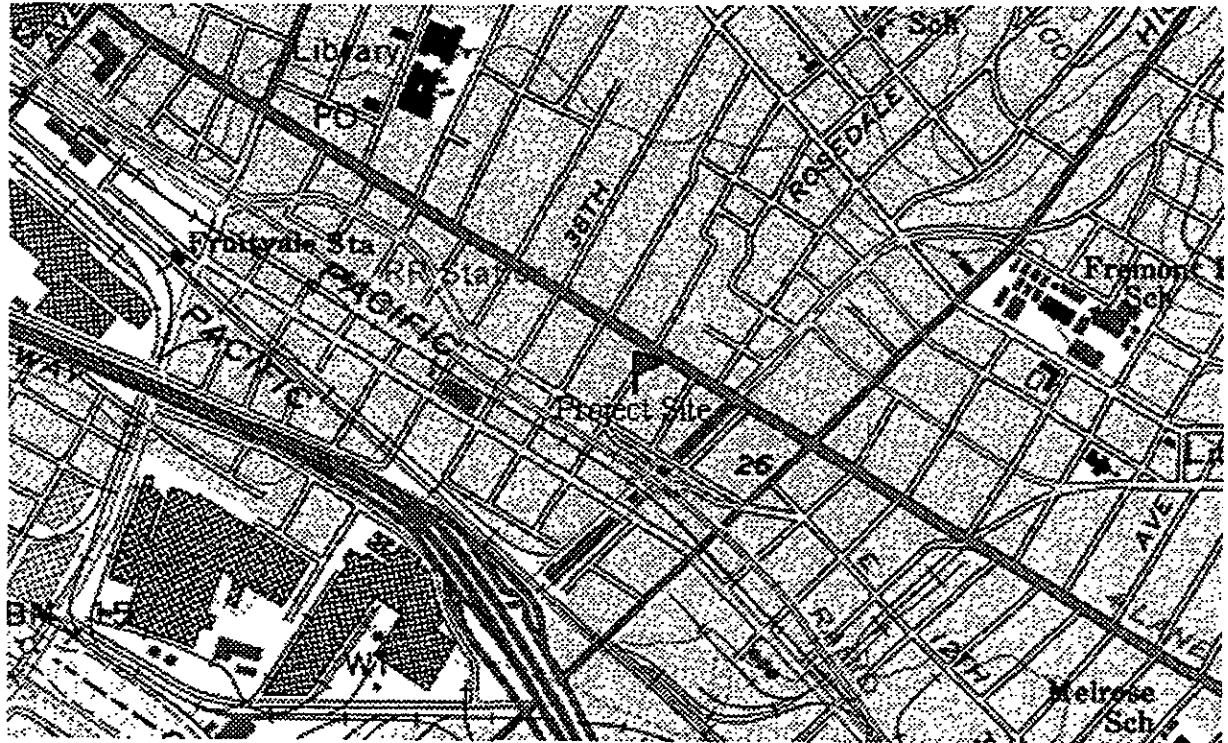
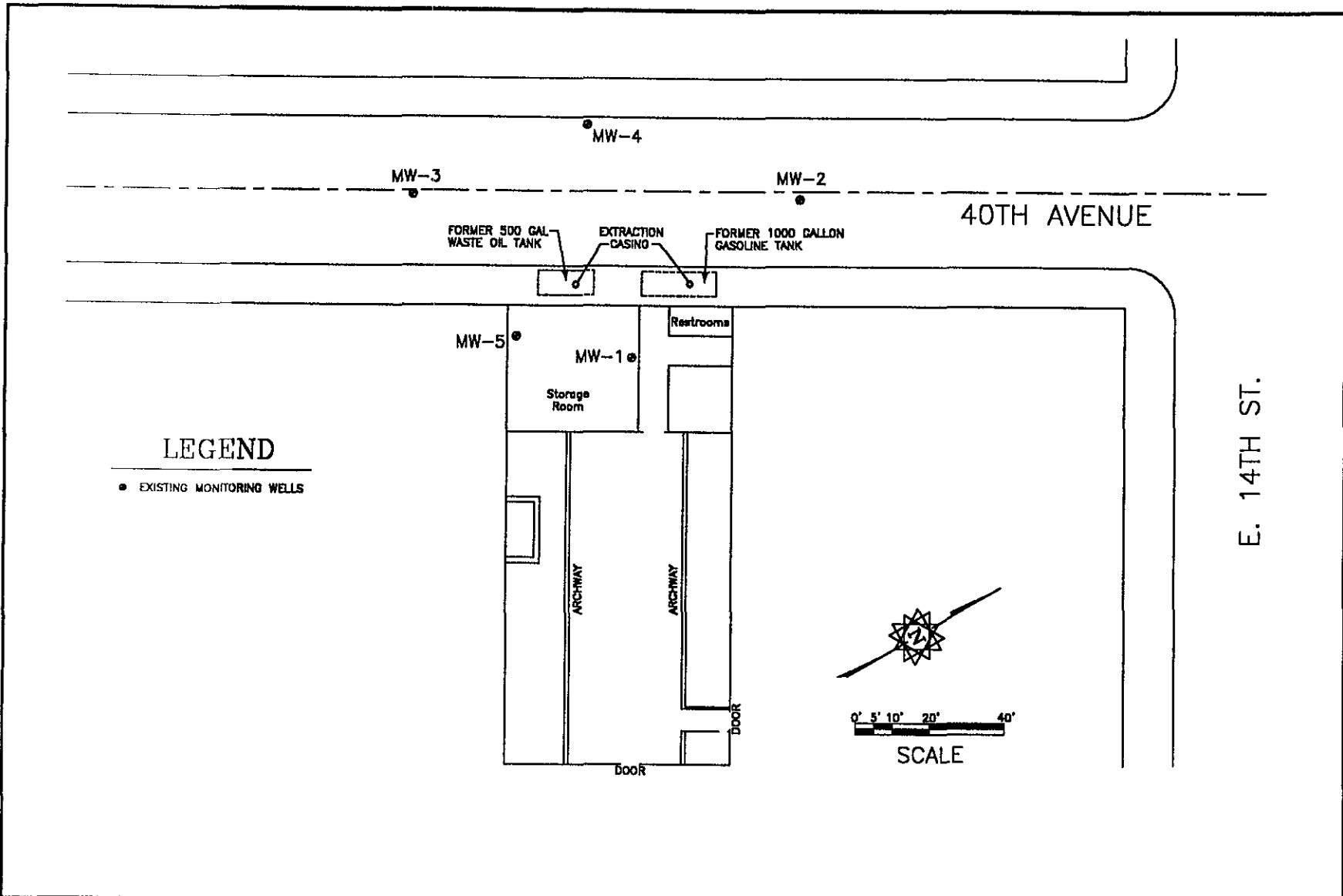


Figure 1. Site Location Map



AQUATIC & ENVIRONMENTAL APPLICATIONS 38053 DAVY CT. FREMONT, CA 94536 (510) 791-7157	DRAWN BY GLR	PROJECT NUMBER 1004	DESCRIPTION Site Layout	FIGURE 2
	DRAWING DATE 7/3/98	FILE NAME 1004-298.DWG		
	REVISION BY	PROJECT MANAGER GLR	PROJECT/LOCATION Motor Partners 1234 40th Ave., Oakland	
	REVISION BY	CHECKED BY		

Sampling conducted on January 11, 1994 indicated levels of TPH-gasoline for the former waste oil tank area between 100 and 700 ppm. Levels of TPH-gasoline for the former gasoline tank area ranged from 150 to 1,200 ppm.

GROWTH Environmental completed soil borings at the property between May and June of 1994. Eleven borings were drilled and three monitoring wells were installed. Both soil and groundwater samples were collected from the borings. Soil and groundwater contamination was found in nearly every boring. Levels of TPH-D up to 2,700 ppm were observed on the west side of the building. A sample from inside the building had a TPH-D level of 520 ppm.

Groundwater samples had highest concentrations near the former tank excavations. The highest level of TPH-G was 64,000 ppb. BTEX compounds were found in groundwater samples from all the borings.

The monitoring wells were sampled on June 17, 1994 and December 7, 1994. Contamination was reported in all three wells. Levels of TPH-G were up to 17,000 ppb and Benzene levels were up to 1,200 ppb in MW-1.

A quarterly monitoring sampling event was completed on November 29, 1995. All of the wells showed increased TPH-G and BTEX levels when compared to the previous sampling event. TPH-G levels were up to 67,000 ppb in MW-1. The groundwater gradient was calculated to be in a southwesterly direction.

Additional geoprobe borings were completed along 40th Avenue between November, 1995 and February, 1996 to determine the extent of contamination.

On February 1, 1996, Bay Area Exploration drilled a soil boring across the street from the former underground storage tank excavations at the Motor Partners site (location shown in Figure 3 ). A two-inch groundwater monitoring well (MW-4) was installed in the boring. The monitoring well was installed according to State of California Water Resource Control Board standards to a depth of 25 feet below grade surface (bgs) and screened from 5 to 25 feet bgs.

On February 11, 1998, HK2, Inc./SEMCO drilled a soil boring inside the building and down gradient from the former underground storage tank excavations (location shown in Figure 3). A two-inch groundwater monitoring well (MW-5) was installed in the boring. The monitoring well was installed to a depth of 21 feet below grade surface (bgs) and screened from 6 to 21 feet bgs.



## GEOLOGY AND HYDROGEOLOGY

### Regional Geology.

The site is located on the East Bay Plain about 1.0 mile west of the Oakland Hills, about 1.0 mile east of the San Francisco Bay, and about 0.5 miles north of San Leandro Bay. The nearest cross street is 14th Street.

The site rests on Quaternary Deposits of various physical and compositional properties. The predominant formation is the Temescal Formation consisting of contemporaneous alluvial units of different origin, lithology, and physical properties. The material ranges from irregularly bedded clay, silt, sand and gravel to lenses of clay, silt, sand, and gravel with Claremont Chert.

The Hayward Fault is approximately 1.5 miles East of the site and is an active historic Fault. The Hayward Fault is the only active fault in the Oakland East Quadrangle.

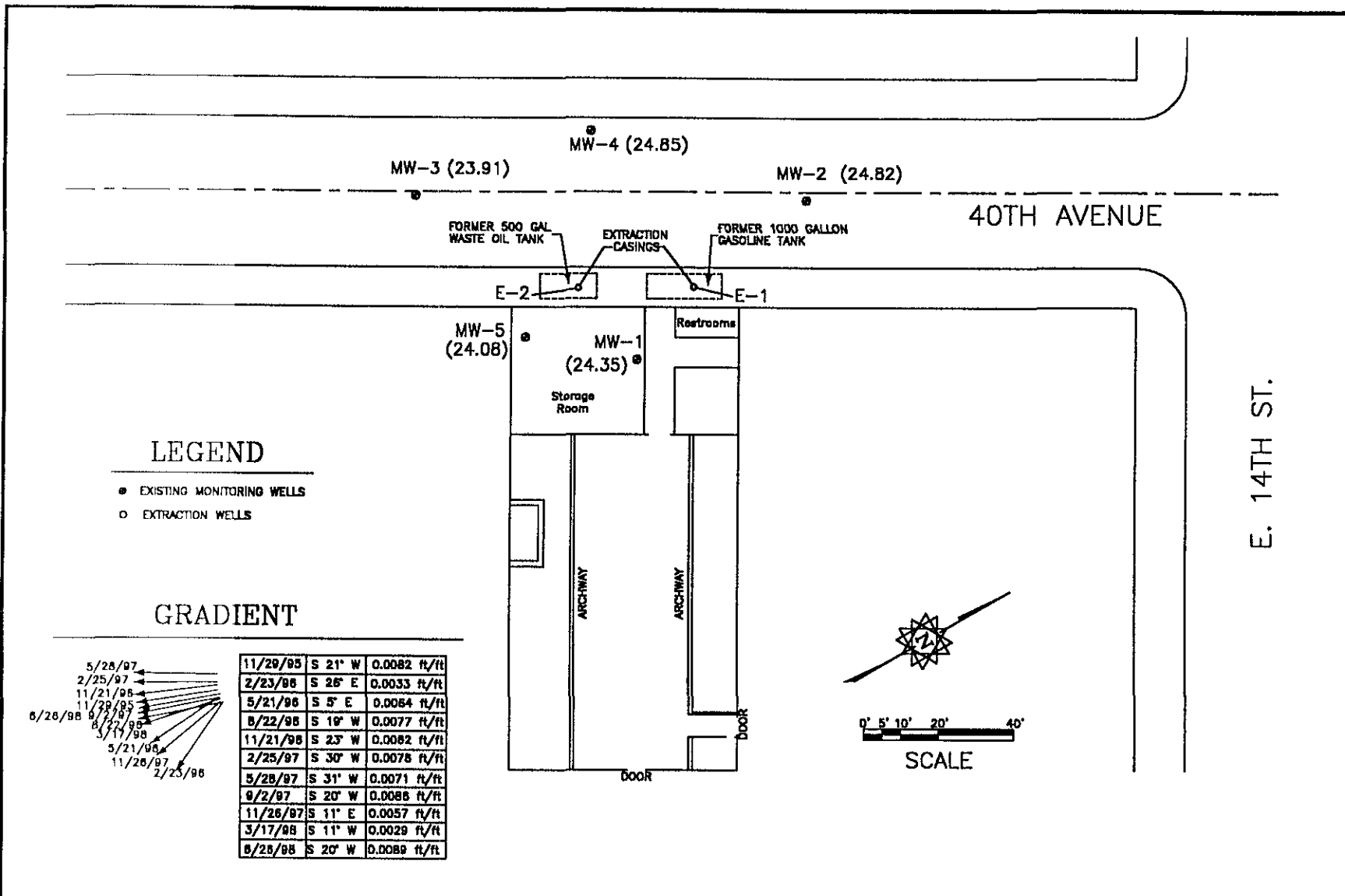
### Regional Hydrogeology.

The site is located within the East Bay Plain which makes up the ground water reservoir in the area. The water bearing capacity varies within the area due to the juxtaposed positions of the various types of soils and strata encountered underneath the East Bay Plain.

In General the water bearing capacities of the Younger Alluvium range from moderately permeable to low permeable soils. Below the Younger Alluvium at a depth of approximately 70 feet lies the Older Alluvium, which yields large to small quantities of well water.

**Site Geology.** The site soils were characterized using the United Soil Classification System (USCS). During on-site subsurface drilling, CEC (GROWTH) encountered up to two feet of baserock (fill) followed by a 4 to 5 foot layer of dark sandy clay (CL). Below the dark clay to a depth between 7 and 15 feet, a grey sandy gravel was found. Below the sandy gravel the soil varied between a clayey sand to a sandy silty clay (SC). The gravels are poorly sorted, angular to rounded clasts ranging in size from 0.2 cm to 3.0 cm.

**Site Hydrogeology.** The depth of first water ranged from 8 to 10 feet below the ground surface (bgs) in the borings. Groundwater was encountered within the grey clayey sandy gravel layers.



<b>AQUATIC &amp; ENVIRONMENTAL APPLICATIONS</b> 38053 DAVY CT. FREMONT, CA 94536 (510) 791-7157	DRAWN BY <b>GLR</b>	PROJECT NUMBER <b>1004</b>	DESCRIPTION <b>Ground Water Gradient</b>	FIGURE <b>3</b>
	DRAWING DATE <b>7/3/98</b>	FILE NAME <b>1004-298.DWG</b>		
	REVISION BY	PROJECT MANAGER <b>GLR</b>	PROJECT/LOCATION <b>Motor Partners                  1234 40th Ave., Oakland</b>	
	REVISION BY	CHECKED BY		

**Table 1**  
**Monitoring Well Construction Data for Motor Partners Site**  
**1234 40th Ave., Oakland, California**

	MW-1	MW-2	MW-3	MW-4	MW-5
Date Drilled	6/15/94	6/14/94	6/14/94	2/1/96	2/11/98
Total Depth	22.5 ft.	22.0 ft.	23.0 ft.	23.0 ft.	21.0 ft.
Bore Diameter	10 inches	10 inches	10 inches	10 inches	6 inches
Casing Diameter	2 inch	2 inch	2 inch	2 inch	2 inch
Well Seal Type	Bentonite Pellets	Bentonite Pellets	Bentonite Pellets	Bentonite Pellets	Bentonite Pellets
Well Seal Interval	5.0 - 6.0 bgs	5.0 - 6.0 bgs	5.0 - 6.0 bgs	3.0 - 4.0 bgs	4.0 - 5.0 bgs
Filter Pack Material	2/14 Lonestar Sand	2/14 Lonestar Sand	2/14 Lonestar Sand	2/14 Lonestar Sand	2/14 Lonestar Sand
Filter Pack Interval	6.0 - 17.0 bgs	9.0 - 20.0 bgs	6.5 - 20.0 bgs	4.0 - 25.0 bgs	5.0 - 21.0 bgs
Screen Slot Size	0.020 in.	0.020 in.	0.020 in.	0.010 in.	0.020 in.
Screened Interval	7.0 - 17.0 bgs	10.0 - 20.0 bgs	7.0 - 20.0 bgs	5.0 - 25.0 bgs	6.0 - 21.0 bgs
Well Elevation <sup>1</sup>	31.44 ft.	31.06 ft.	31.43 ft.	31.37 ft.	31.15 ft.

<sup>1</sup>TOC -Top of Casing Elevations for MW-1, MW-2, MW-3, and MW-4 were surveyed on 8/22/96 by Kier & Wright Civil Engineers & Surveyors, Inc. TOC. Elevation for MW-5 surveyed on 3/20/98 by AEA.

## GROUNDWATER MONITORING

### GROUNDWATER ELEVATION MEASUREMENTS

The static water level was measured in all five monitoring wells (MW-1, MW-2, MW-3, MW-4 and MW-5) on June 26, 1998 and the depths were recorded to the nearest 0.01 foot using an electronic water level sounder. All of the results were recorded on Quarterly Monitoring Data Sheets presented in Appendix B.

### MONITORING WELL SAMPLING

The monitoring wells were purged by withdrawing a minimum of three casing volumes from each well using a 2" submersible pump. The purging continued until the turbidity was less than 100 NTU and the temperature, electric conductivity, and pH were relatively stable. Samples were collected when the water levels recovered to at least 80% of the original static level.

A groundwater sample was collected with a disposable Teflon bailer and placed in two 40-ml VOA's and one one-liter amber bottle. The samples were labeled and stored on ice until delivered under a chain of custody to the state certified laboratory. Samples from all five wells (MW-1, MW-2, MW-3, MW-4, and MW-5) were analyzed for total petroleum hydrocarbons as diesel (TPH-D), using EPA methods modified 8015; as gasoline (TPH-G) using EPA methods 8015/5030; benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA methods 8020; and methyl t-butyl ether (MTBE) using EPA method 8020.

In addition to the petroleum hydrocarbon parameters, samples from the five wells were analyzed on-site for dissolved oxygen and redox potential. Groundwater samples from each of the wells were also submitted to a state certified laboratory for analysis of nitrate, sulfate, iron, total phosphorus, and ammonia.

## ANALYTICAL RESULTS

### GROUNDWATER HYDRAULIC CONDITIONS

**Groundwater Elevation.** The groundwater elevation data for the monitoring wells is presented in Table 2. Based on groundwater level measurements collected on June 26, 1998, the depth to groundwater in the wells ranged from 5.5 to 7.1 feet below the top of the casing. The groundwater elevations for the wells were as follows; MW-1 was 24.35 feet above mean sea level (msl), MW-2 was 24.82 feet above msl, MW-3 was 23.91 feet above msl, MW-4 was 24.85 feet above msl, and MW-5 was 24.08 feet above msl.

**Groundwater Flow Direction and Gradient.** Groundwater flow direction was calculated using three wells (MW-1, MW-2, and MW-3). Groundwater flow direction trended to the southwest (S 20°W) at a gradient of 0.0089 ft/ft. The flow direction and gradient are shown in Figure 3.

### LABORATORY DATA

A summary of the hydrocarbon analytical results for the quarterly sampling is presented in Table 3. Table 4 presents the results of on-site sampling for dissolved oxygen and redox potential. A summary of the other bio-parameters is presented in Table 5. The additional bio-parameters include; nitrate, sulfate, iron, total phosphorus, and ammonia. Copies of all the analytical data sheets from McCampbell Analytical Lab are presented in Appendix A.

**Table 2**  
**Groundwater Elevation Results at Motor Partners Site**  
**1234 40th Ave., Oakland, California**

	DATE	MW-1	MW-2	MW-3	MW-4	GRADIENT
TOC		31.44 ft	31.06 ft	30.43 ft.	30. 37 ft.	
SWL	11/29/95	10.13	9.31	9.53		S 21° W
GSE		21.31	21.75	20.90		0.0082 ft/ft
SWL	2/23/96	4.59	3.77	3.56	3.17	S 26° E
GSE		26.85	27.29	26.87	27.20	0.0033 ft/ft
SWL	5/21/96	6.04	5.24	5.29	4.68	S 5° E
GSE		25.40	25.82	25.14	25.69	0.0064 ft/ft
SWL	8/22/96	8.46	7.66	7.88	7.10	S 19° W
GSE		22.98	23.40	22.55	23.27	0.0077 ft/ft
SWL	11/21/96	8.44	7.73	7.76	7.31	S 23° W
GSE		23.00	23.33	22.67	23.06	0.0062 ft/ft
SWL	2/25/97	6.53	5.78	5.97	5.06	S 30° W
GSE		24.91	25.28	24.46	25.31	0.0076 ft/ft
SWL	5/28/97	8.08	7.38	7.53	6.94	S 31° W
GSE		23.36	23.68	22.90	23.43	0.0071 ft/ft
SWL	9/2/97	9.08	8.24	9.26	7.84	S 20° W
GSE		22.36	22.82	21.17	22.53	0.0086 ft/ft
SWL	11/26/97	7.98	7.24	7.06	6.64	S 11° E
GSE		23.46	23.82	23.37	23.73	0.0057 ft/ft

TOC - Top of Casing Elevations for MW-1, MW-2, MW-3, and MW-4 were surveyed on 8/22/96 by Kier & Wright Civil Engineers & Surveyors, Inc.

SWL - Static Water Level (ft)

GSE - Groundwater Surface Elevation (feet relative to mean sea level)

**Table 2 (Continued)**  
**Groundwater Elevation Results at Motor Partners Site**  
**1234 40th Ave., Oakland, California**

	DATE	MW-1	MW-2	MW-3	MW-4	MW-5	GRADIENT
TOC		31.44 ft	31.06 ft	30.43 ft.	30. 37 ft.	31.15 ft.	
SWL	3/17/98	5.84	5.05	5.11	4.52	5.80 .	S 11° W
GSE		25.60	26.01	25.32	25.85	25.35	0.0029 ft/ft
SWL	6/26/98	7.09	6.24	6.52	5.52	7.07	S 20° W
GSE		24.35	24.82	23.91	24.85	24.08	0.0089 ft/ft
SWL							
GSE							
SWL							
GSE							
SWL							
GSE							
SWL							
GSE							
SWL							
GSE							
SWL							
GSE							

TOC - Top of Casing Elevations for MW-1, MW-2, MW-3, and MW-4 were surveyed on 8/22/96 by Kier & Wright Civil Engineers & Surveyors, Inc. Elevation for MW-5 surveyed on 3/20/98 by AEA.  
 SWL - Static Water Level (ft)  
 GSE - Groundwater Surface Elevation (feet relative to mean sea level)

**Table 3**  
**Quarterly Groundwater Sampling Results at Motor Partners**  
**1234 40th Ave., Oakland, California**

Sample I.D. Number	Date Collected	TPH-D ( $\mu\text{g/L}$ )	TPH-G ( $\mu\text{g/L}$ )	MTBE ( $\mu\text{g/L}$ )	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethyl Benzene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-1	6/17/94	2,400	17,000		1,200	220	1,000	2,600
	11/29/95	53,000	67,000		860	180	1,300	3,100
	2/23/96	25,000	16,000		360	ND	370	740
	5/21/96	650	11,000		290	37	600	1,300
	8/22/96	ND	13,000		270	51	540	1,400
	11/21/96	5,500	15,000		810	79	680	1,700
	2/25/97	3,900	15,000		430	36	760	1,200
	5/28/97	3,700	7,600		110	15	370	870
	9/2/97	8,200	18,000	ND	1,300	81	1,300	2,800
	11/26/97	14,000	24,000	81	760	75	660	2,100
	3/17/98	5,000	14,000	150	360	120	650	1,200
	6/26/98	1,200	2,500	ND	60	5.6	76	110
California Drinking Water MCL		None Listed	None Listed	None Listed	1.0	1,000	680	1,750
Reporting Limit		50	50	5	0.5	0.5	0.5	1.0

Notes: All results in  $\mu\text{g/l}$  (ppb)  
 ND = Not Detected  
 NA = Not Analyzed



**Table 3 Continued**  
**Quarterly Groundwater Sampling Results at Motor Partners**  
**1234 40th Ave., Oakland, California**

Sample I.D. Number	Date Collected	TPH-D ( $\mu\text{g/L}$ )	TPH-G ( $\mu\text{g/L}$ )	MTBE ( $\mu\text{g/L}$ )	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethyl Benzene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-2	6/17/94	370	990		ND	1.3	2.3	4.4
	12/07/94	ND	170		2.1	0.70	0.60	1.7
	11/29/95	200	400		ND	ND	ND	3
	2/23/96	ND	500		ND	ND	ND	ND
	5/21/96	ND	62		ND	ND	ND	1
	8/22/96	ND	120		0.58	0.62	ND	0.62
	11/21/96	89	89		0.60	0.78	ND	ND
	2/25/97	ND	250		1.2	1.0	ND	ND
	5/28/97	ND	ND		ND	ND	ND	ND
	9/2/97	ND	220	ND	ND	1.2	0.80	1.7
	11/26/97	ND	ND	ND	ND	ND	ND	ND
	3/17/98	ND	ND	ND	ND	ND	ND	ND
	6/26/98	170	260	ND	ND	0.86	ND	0.63
California Drinking Water MCL		None Listed	None Listed	None Listed	1.0	1,000	680	1,750
Reporting Limit		50	50	5	0.5	0.5	0.5	1.0

Notes: All results in  $\mu\text{g/l}$  (ppb)  
 ND = Not Detected  
 NA = Not Analyzed

**Table 3 Continued**  
**Quarterly Groundwater Sampling Results at Motor Partners**  
**1234 40th Ave., Oakland, California**

Sample LD. Number	Date Collected	TPH-D ( $\mu\text{g/L}$ )	TPH-G ( $\mu\text{g/L}$ )	MTBE ( $\mu\text{g/L}$ )	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethyl Benzene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-3	6/17/95	2,200	9,500		330	40	100	74
	12/07/94	1,700	7,500		380	42	130	72
	11/29/95	14,000	9,000		300	49	300	16
	2/23/96	14,000	13,000		270	83	260	67
	5/21/96	350	6,600		220	48	160	66
	8/22/96	ND	4,800		120	34	44	44
	11/21/96	3,300	8,700		220	51	150	68
	2/25/97	ND	8,200		260	57	200	72
	5/28/97	1,800	7,000		140	22	44	31
	9/2/97	ND	8,100	65	240	50	170	72
	11/26/97	4,100	5,600	44	140	22	9.6	31
	3/17/98	2,100	10,000	330	270	67	260	96
	6/26/98	2,400	7,600	ND	280	56	160	73
California Drinking Water MCL		None Listed	None Listed	None Listed	1.0	1,000	680	1,750
Reporting Limit		50	50	5	0.5	0.5	0.5	1.0

Notes: All results in  $\mu\text{g/l}$  (ppb)  
 ND = Not Detected  
 NA = Not Analyzed

**Table 3 Continued**  
**Quarterly Groundwater Sampling Results at Motor Partners**  
**1234 40th Ave., Oakland, California**

Sample I.D. Number	Date Collected	TPH-D ( $\mu\text{g/L}$ )	TPH-G ( $\mu\text{g/L}$ )	MTBE ( $\mu\text{g/L}$ )	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethyl Benzene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-4	2/23/96	3,000	6,000		58	36	6	28
	5/21/96	78	1,200		18	2.5	6.2	12
	8/22/96	ND	400		8.6	3.4	1.8	2.6
	11/21/96	87	170		3.6	1.1	1.7	2.3
	2/25/97	ND	120		5.4	0.64	0.93	0.80
	5/28/97	55	150		5.6	0.64	4.4	8.8
	9/2/97	ND	100	ND	3.2	ND	ND	0.7
	11/26/97	ND	240	ND	6.8	ND	1.8	10
	3/17/98	200	300	8.9	4.4	5.1	5.1	20
	6/26/98	66	ND	ND	7.7	0.50	0.84	0.61

Sample I.D. Number	Date Collected	TPH-D ( $\mu\text{g/L}$ )	TPH-G ( $\mu\text{g/L}$ )	MTBE ( $\mu\text{g/L}$ )	Benzene ( $\mu\text{g/L}$ )	Toluene ( $\mu\text{g/L}$ )	Ethyl Benzene ( $\mu\text{g/L}$ )	Total Xylenes ( $\mu\text{g/L}$ )
MW-5	3/17/98	22,000	58,000	ND	320	590	790	2,300
	6/26/98	7,000	2,300	ND	54	20	14	41
California Drinking Water MCL		None Listed	None Listed	None Listed	1.0	1,000	680	1,750
Reporting Limit		50	50	5	0.5	0.5	0.5	1.0

Notes: All results in  $\mu\text{g/l}$  (ppb)  
 ND = Not Detected  
 NA = Not Analyzed

**Table 4. Dissolved Oxygen and Redox Results  
Motor Partners, 1234 40th Ave., Oakland, California**

Sample I.D. Number	Date Collected	Dissolved Oxygen (mg/L)	Redox Potential (mv)
MW-1	11/26/97	1.5	56
	3/17/98	0.9	-2.0
	6/26/98	1.0	-64
MW-2	11/26/97	3.0	162
	3/17/98	2.7	90
	6/26/98	4.3	144
MW-3	11/26/97	2	67
	3/17/98	1.5	18
	6/26/98	1.8	-72
MW-4	11/26/97	2.4	114
	3/17/98	1.7	69
	6/26/98	2.8	99
MW-5	3/17/98	1.5	40
	6/26/98	0.9	-33

**Table 5. Results of Additional Bioremediation Parameters  
Motor Partners, 1234 40th Ave., Oakland, California**

Sample I.D. Number	Date Collected	Ferrous Iron (mg/L)	Ammonia-N (mg/L)	Nitrate-N (mg/L)	Sulfate (mg/L)	Total Phosphorus (mg/L)
MW-1	11/26/97	1.2	<0.05	<0.05	4200	0.06
	3/17/98	2.0	0.22	<0.05	97	0.14
	6/26/98	3.0	ND	ND	2000	ND
MW-2	11/26/97	ND	<0.05	1.1	3100	0.08
	3/17/98	0.21	0.08	11	41	0.13
	6/26/98	0.087	ND	7.2	33	ND
MW-3	11/26/97	2.8	<0.05	<0.05	4100	0.45
	3/17/98	0.31	0.06	<0.05	<2.0	0.17
	6/26/98	3.0	ND	ND	ND	ND
MW-4	11/26/97	ND	<0.05	0.66	4900	0.16
	3/17/98	0.17	0.06	7.4	33	0.07
	6/26/98	0.21	ND	7.1	32	ND
MW-5	3/17/98	0.49	0.06	0.83	40	0.13
	6/26/98	0.26	ND	1.7	22	ND

Notes: All results in mg/L (ppm)  
 ND = Not Detected  
 NA = Not Analyzed

## SUMMARY AND RECOMMENDATIONS

The five monitoring wells at Motor Partners were purged and sampled for the second quarter, 1998. The results of the sampling indicate that hydrocarbon contamination is present in groundwater samples from all five wells. Concentrations of hydrocarbons were in the same range as the results from the previous monitoring period.

TPH-Gasoline and Benzene contamination exists in groundwater on the property. The highest concentrations reported from the five wells were from the groundwater samples collected at MW-1, MW-3, and MW-5. Groundwater flow direction for this sampling period was shown to be in a southwesterly direction.

In addition to the petroleum hydrocarbon parameters discussed above, samples were collected from each of the wells for analysis of dissolved oxygen, redox, nitrate, sulfate, iron, total phosphorus, and ammonia.

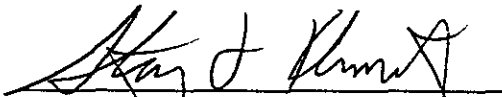
A program using Oxygen Release Compound (ORC) has been approved by Alameda County and will be implemented when approvals are received from the State Fund.

Investigation and remediation activities are on-going at the site. It is recommended that quarterly groundwater sampling be continued.

## LIMITATIONS

This report has been prepared in accordance with generally accepted environmental, geological and engineering practices. No warranty, either expressed or implied is made as to the professional advice presented herein. The analysis, conclusions, and recommendations contained in this report are based upon site conditions as they existed at the time of the investigation and they are subject to change.

The conclusions presented in this report are professional opinions based solely upon visual observations of the site and vicinity, and interpretation of available information as described in this report. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users and any use or reuse of this document or its findings, conclusions or recommendations presented herein is at the sole risk of the said user.



Stanley L. Klemetson Ph.D., P.E.  
P.E No. 40087



**APPENDIX A**

**Analytical Results**



# CHAIN OF CUSTODY

Date: 6-26-98  
 Project Name: Motor Partners  
 Project Number: 1004  
 Report Results To: Gary Rogers  
 Sampler Name: G. Rogers  
 Turn Around Time: 5 days


Aquatic & Environmental Applications  
 38053 Davy Ct., Fremont, CA 94536  
 Telephone/FAX: (510) 791-7157

Laboratory: McCampbell Analytical  
 Name: McCampbell Analytical  
 Address: 110 2nd Ave S. Pacheco CA  
 Telephone: 925-798-1620 Fax: 925-798-1622

SAMPLE NUMBER	DATE	TIME	LOCATION	SAMPLE TYPE	ANALYSIS REQUESTED							COMMENTS - DESCRIPTION - SPECIAL INSTRUCTIONS
					TPH-D	TPH-G	BTEX	MTBE	Aromatic N Pinnacene N	Total Pheno L	Sulfide	
MW-5	6-26-98	1:00	MW-5	W	X	X	X	X	X	X	X	
MW-1	6-26-98	1:15	MW-1	W	X	X	X	X	X	X	X	
MW-4	6-26-98	1:25	MW-4	W	X	X	X	X	X	X	X	
MW-3	6-26-98	1:45	MW-3	W	X	X	X	X	X	X	X	
MW-2	6-26-98	2:00	MW-2	W	X	X	X	X	X	X	X	
VOAS   O&G   METALS   OTHER												
CE/✓ GOOD CONDITION ✓ HEAD SPACE ABSENT ✓					PRESERVATION ✓ APPROPRIATE CONTAINERS ✓							

SAMPLE RELINQUISHED BY:				SAMPLE RECEIVED BY:			
Print Name	Signature	Date	Time	Print Name	Signature	Date	Time
Gary Rogers	<i>Gary Rogers</i>	6-26-98	3:30 pm	H. J. Kisser	<i>H. J. Kisser</i>	6/26/98	3:30

07-07-1998 08:02PM FROM McCampbell Analytical Inc TO 7917157 P.02

 <b>McCAMPBELL ANALYTICAL INC.</b>	110 2nd Ave. South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 <a href="http://www.mccampbell.com">http://www.mccampbell.com</a> E-mail: <a href="mailto:main@mccampbell.com">main@mccampbell.com</a>
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Aquatic & Environmental Applications  38053 Davy Court  Fremont, CA 94536	Client Project ID: #1004; Motor Partners	Date Sampled: 06/26/98
	Client Contact: Gary Rogers	Date Received: 06/26/98
	Client P.O:	Date Extracted: 07/02-07/03/98
		Date Analyzed: 07/02-07/03/98

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline\*, with Methyl tert-Butyl Ether\* & BTEX\***  
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GC/FID(5030)

Lab ID	Client ID	Matrix	TPH(g) <sup>f</sup>	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
91199	MW-5	W	2300,a,h	ND<60	54	20	14	41	98
91200	MW-1	W	2500,a	ND<30	60	5.6	76	110	107
91201	MW-4	W	ND	ND	7.7	0.50	0.84	0.61	95
91202	MW-3	W	7600,a	ND<190	280	56	160	73	107
91203	MW-2	W	260j	ND	ND	0.86	ND	0.63	98
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

\* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

\* cluttered chromatogram; sample peak coelutes with surrogate peak

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant (aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol % sediment; j) no recognizable pattern

	<b>McCAMPBELL ANALYTICAL INC.</b>	110 2nd Ave. South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 <a href="http://www.mccampbell.com">http://www.mccampbell.com</a> E-mail: <a href="mailto:main@mccampbell.com">main@mccampbell.com</a>
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Aquatic & Environmental Applications 38053 Davy Court Fremont, CA 94536	Client Project ID: #1004; Motor Partners	Date Sampled: 06/26/98
	Client Contact: Gary Rogers	Date Received: 06/26/98
	Client P.O:	Date Analyzed: 07/02-07/06/98
		Date Extracted: 07/01/98

**Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel \***

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(†)	% Recovery Surrogate
91199	MW-5	W	7000,g,d,h	108
91200	MW-1	W	1200,d,g	107
91201	MW-4	W	66,b	112
91202	MW-3	W	2400,d,g	100
91203	MW-2	W	170,g,d	99
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	50 ug/L		
	S	1.0 mg/kg		

\* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP / STLC / SPLP extracts in ug/L

† cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

‡ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant, no recognizable pattern; c) aged diesel? is significant; d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel (?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol % sediment.

 <b>McCAMPBELL ANALYTICAL INC.</b>	110 2nd Ave. South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 <a href="http://www.mccampbell.com">http://www.mccampbell.com</a> E-mail: main@mccampbell.com
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Aquatic & Environmental Applications 38053 Davy Court Fremont, CA 94536	Client Project ID: #1004; Motor Partners	Date Sampled: 06/26/98
		Date Received: 06/26/98
	Client Contact: Gary Rogers	Date Extracted: 06/29/98
	Client P.O:	Date Analyzed: 06/29/98

Metals by ICP*				
EPA analytical methods 6010, 200.7				
Lab ID	Client ID	Matrix	Extraction <sup>o</sup>	Ferrous Iron <sup>+</sup>
91199	MW-5	W	Dissolved	0.26
91200	MW-1	W	Dissolved	3.0
91201	MW-4	W	Dissolved	0.21
91202	MW-3	W	Dissolved	3.0
91203	MW-2	W	Dissolved	0.087
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W	TTLIC		0.05 mg/L
	S	TTLIC		3.0 mg/kg
	--	STLC,TCLP		0.10 mg/L

\* water samples are reported in mg/L, soil and sludge samples in mg/kg, wipes in ug/wipe and all TCLP / STLC / SPLP extracts in mg/L  
<sup>o</sup> EPA extraction methods 1311(TCLP), 3010/3020(water,TTLIC), 3040(organic matrices,TTLIC), 3050(solids,TTLIC), S111 - CA Title 22  
<sup>+</sup> reporting limit raised due to matrix interference  
 1) liquid sample that contains greater than ~2 vol. % sediment; this sediment is extracted with the liquid, in accordance with EPA methodologies and can significantly effect reported metal concentrations, 2) dissolved iron assumed to be equal to ferrous iron.

# REAL CHAIN OF CUSTODY

Date: 6-26-98  
 Project Name: Motor Partners  
 Project Number: 1004  
 Report Results To: Gary Rogers  
 Sampler Name: G. Rogers  
 Turn Around Time: 5 days

Aquatic & Environmental Applications  
 38053 Davy Ct., Fremont, CA 94536  
 Telephone/FAX: (510) 791-7157

Laboratory:  
 Name: McCampbell Analytical  
 Address: 110 2nd Ave S Pacheco CA  
 Telephone: 925-798-1620 Fax: 925-798-1622

SAMPLE NUMBER	DATE	TIME	LOCATION	SAMPLE TYPE	ANALYSIS REQUESTED						COMMENTS - DESCRIPTION - SPECIAL INSTRUCTIONS
					TPH-D	TPH-G	BTEX	MTBE	Nitrate-N Ammonium-N Total Phosphate Sulfate Ferrozinc		
MW-5	6-26-98	1:00	MW-5	W	X	X	X	X	X	X	
MW-1	6-26-98	1:15	MW-1	W	X	X	X	X	X	X	
MW-4	6-26-98	1:25	MW-4	W	X	X	X	X	X	X	
MW-3	6-26-98	1:45	MW-3	W	X	X	X	X	X	X	
MW-2	6-26-98	2:00	MW-2	W	X	X	X	X	X	X	
VOAS/O&G/METALS/OTHER											
CAP ✓ GOOD CONDITION ✓ HEAD SPACE ABSENT ✓					PRESERVATION ✓ APPROPRIATE CONTAINERS ✓						

SAMPLE RELINQUISHED BY:

SAMPLE RECEIVED BY:

Print Name	Signature	Date	Time	Print Name	Signature	Date	Time
Gary Rogers	<i>Gary Rogers</i>	6-26-98	3:30pm	H. Cicca	<i>H. Cicca</i>	6/26/98	3:30

07-10-1998 12:40PM FROM McCampbell Analytical Inc TO 7917157 P.02

# GeoAnalytical Laboratories, Inc.

1405 Kansas Avenue  
Modesto, CA 95351

Phone (209) 572-0900  
FAX (209) 572-0916

## CERTIFICATE OF ANALYSIS

Report # J178-03  
McCampbell Analytical  
110 2nd Avenue #07  
Pacheco CA 94553-5560

Date of Report: 07/07/98  
Date Received: 06/27/98  
Date Started: 06/27/98  
Date Completed: 07/06/98

Project Name: AEA-Motor

Project # 11589

Sample ID	Lab ID	Detection Limit	Method	Analyte	Results	Units mg/L
MW-5	J33142	0.2	300	Nitrate as N	1.7	
		0.5	351.3	Ammonia as N	ND	
		0.05	365.2	Total Phosphate	ND	
		1	300	Sulfate	22	
MW-1	J33143	0.2	300	Nitrate as N	ND	
		0.5	351.3	Ammonia as N	ND	
		0.05	365.2	Total Phosphate	ND	
		1	300	Sulfate	2000	
MW-4	J33144	0.2	300	Nitrate as N	7.1	
		0.5	351.3	Ammonia as N	ND	
		0.05	365.2	Total Phosphate	ND	
		1	300	Sulfate	32	
MW-3	J33145	0.2	300	Nitrate as N	ND	
		0.5	351.3	Ammonia as N	ND	
		0.05	365.2	Total Phosphate	ND	
		1	300	Sulfate	ND	
MW-2	J33146	0.2	300	Nitrate as N	7.2	
		0.5	351.3	Ammonia as N	ND	
		0.05	365.2	Total Phosphate	ND	
		1	300	Sulfate	35	

*Ramiro Salgado*  
Ramiro Salgado  
Chemist

Certification # 1157

*Donna Keller*  
Donna Keller  
Laboratory Director

**APPENDIX B**

**Quarterly Monitoring Data Sheets**

Quarterly Monitoring Data Sheet						
Date: <u>6/26/98</u>			Well Diameter: <u>2 Inches</u> Well ID: <u>MW-1</u>			
Project Location: <u>Motor Partners Site</u> <u>1234 40th Ave., Oakland</u>			Well Type: <u>Monitoring Well</u>			
Sampler: <u>G. Rogers</u>			Total Depth as Built: <u>19 ft</u>		Screened Interval: <u>7 ft to 17 ft</u>	
Water Level Data			Purge Calculation (Min 3 Casing Volumes)			
Time Depth Sounded: <u>11:25 AM</u>			gal/ft X ft = gal X 3 = gal			
Measured Depth to Water: <u>7.09 ft.</u>			0.163 X 11.1 = 1.8 X 3 = 5.4			
Measured Total Depth: <u>18.2 ft.</u>						
Purge Data						
Time	Flowrate (gpm)	Volume (gal)	Temp (°C)	EC (µs/cm)	pH	Turbidity (NTU)
11:30		0	19.1	550	6.22	251
11:34		2	18.6	534	6.60	33
11:37		4	18.5	524	6.69	34
11:40		6	18.6	521	6.74	24
<b>Observations/Comments:</b>						
Inside Building						
<b>Laboratory Analysis:</b>						
Sample at 1:15 PM						
Water depth -						
Analyze for TPH-D, TPH-G, BTEX, and MTBE; Nitrate, Ammonia, Total Phosphorus, Ferrous Iron, Sulfate, REDOX, and Dissolved Oxygen.						
<b>Data for Volume Calculation:</b>						
1 cu. ft. = 7.48 gal = 62.4 lbs (approx)			1 gal = 0.134 cu. ft. = 8.34 lbs (approx)			
2" well = 0.163 gal/linear ft.			3" well = 0.367 gal/linear ft.			
4" well = 0.653 gal/linear ft.			6" well = 1.469 gal/linear ft.			



Quarterly Monitoring Data Sheet						
Date: <u>6/26/98</u>			Well Diameter: <u>2 Inches</u> Well ID: <u>MW-2</u>			
Project Location: <u>Motor Partners Site</u> <u>1234 40th Ave., Oakland</u>			Well Type: <u>Monitoring Well</u>			
Sampler: <u>G. Rogers</u>			Total Depth as Built: <u>22 ft</u>			
			Screened Interval: <u>10 ft to 20 ft</u>			
Water Level Data			Purge Calculation (Min 3 Casing Volumes)			
Time Depth Sounded: <u>12:26 PM</u>			gal/ft X ft = gal X 3 = gal			
Measured Depth to Water: <u>6.24 ft.</u>			0.163 X 13.3 = 2.2 X 3 = 6.5			
Measured Total Depth: <u>19.5 ft.</u>						
Purge Data						
Time	Flowrate (gpm)	Volume (gal)	Temp (°C)	EC (µs/cm)	pH	Turbidity (NTU)
12:28		0	19.7	504	6.97	32
12:31		3	19.6	508	6.97	33
12:33		6	20.0	508	6.98	28
12:35		8	20.0	509	7.02	12
<b>Observations/Comments:</b>						
Clear and Sunny						
<b>Laboratory Analysis:</b>						
Sample at 2:00 PM						
Water depth -						
Analyze for TPH-D, TPH-G, BTEX and MTBE; Nitrate, Ammonia, Total Phosphorus, Ferrous Iron, Sulfate, REDOX, and Dissolved Oxygen.						
<b>Data for Volume Calculation:</b>						
1 cu. ft. = 7.48 gal = 62.4 lbs (approx)			1 gal = 0.134 cu. ft. = 8.34 lbs (approx)			
2" well = 0.163 gal/linear ft.			3" well = 0.367 gal/linear ft.			
4" well = 0.653 gal/linear ft.			6" well = 1.469 gal/linear ft.			

Quarterly Monitoring Data Sheet							
Date: <u>6/26/98</u>				Well Diameter: <u>2 Inches</u> Well ID: <u>MW-3</u>			
Project Location: <u>Motor Partners Site</u>				Well Type: <u>Monitoring Well</u>			
<u>1234 40th Ave., Oakland</u>				Total Depth as Built: <u>23 ft</u>			
Sampler: <u>G. Rogers</u>				Screened Interval: <u>7 ft to 20 ft</u>			
Water Level Data				Purge Calculation (Min 3 Casing Volumes)			
Time Depth Sounded: <u>12:10 PM</u>				gal/ft X ft = gal X 3 = gal			
Measured Depth to Water: <u>6.52 ft.</u>				0.163 X <u>14.3</u> = <u>2.3</u> X 3 = <u>6.9</u>			
Measured Total Depth: <u>20.8 ft.</u>							
Purge Data							
Time	Flowrate (gpm)	Volume (gal)	Temp (°C)	EC (µs/cm)	pH	Turbidity (NTU)	
12:12		0	20.0	594	6.95	30	
12:14		3	19.8	584	6.88	29	
12:16		6	19.7	591	6.89	34	
12:18		8	19.7	586	6.89	32	
<b>Observations/Comments:</b>							
Clear and Sunny Orange colored particles in the water							
<b>Laboratory Analysis:</b>							
Sample at 1:45 PM Water depth - Analyze for TPH-D, TPH-G, BTEX and MTBE; Nitrate, Ammonia, Total Phosphorus, Ferrous Iron, Sulfate, REDOX, and Dissolved Oxygen.							
<b>Data for Volume Calculation:</b>							
1 cu. ft. = 7.48 gal = 62.4 lbs (approx)				1 gal = 0.134 cu. ft. = 8.34 lbs (approx)			
2" well = 0.163 gal/linear ft.				3" well = 0.367 gal/linear ft.			
4" well = 0.653 gal/linear ft.				6" well = 1.469 gal/linear ft.			

Quarterly Monitoring Data Sheet						
Date: <u>6/26/98</u>			Well Diameter: <u>2 Inches</u> Well ID: <u>MW-4</u>			
Project Location: <u>Motor Partners Site</u> <u>1234 40th Ave., Oakland</u>			Well Type: <u>Monitoring Well</u>			
Sampler: <u>G. Rogers</u>			Total Depth as Built: <u>25 ft</u>			
			Screened Interval: <u>5 ft to 25 ft</u>			
Water Level Data			Purge Calculation (Min 3 Casing Volumes)			
Time Depth Sounded: <u>11:46 AM</u>			gal/ft X ft = gal X 3 = gal			
Measured Depth to Water: <u>5.52 ft.</u>			0.163 X 18.7 = 3.0 X 3 = 9.0			
Measured Total Depth: <u>24.2 ft.</u>						
Purge Data						
Time	Flowrate (gpm)	Volume (gal)	Temp (°C)	EC (µs/cm)	pH	Turbidity (NTU)
11:49		0	19.9	531	6.96	> 1000
11:52		3	19.8	511	6.98	205
11:55		6	20.1	509	6.93	35
11:59		9	19.9	513	6.93	32
<b>Observations/Comments:</b>						
Clear and Sunny						
<b>Laboratory Analysis:</b>						
Sample at 1:25 PM						
Water depth -						
Analyze for TPH-D, TPH-G, BTEX and MTBE; Nitrate, Ammonia, Total Phosphorus, Ferrous Iron, Sulfate, REDOX, and Dissolved Oxygen.						
<b>Data for Volume Calculation:</b>						
1 cu. ft. = 7.48 gal = 62.4 lbs (approx)			1 gal = 0.134 cu. ft. = 8.34 lbs (approx)			
2" well = 0.163 gal/linear ft.			3" well = 0.367 gal/linear ft.			
4" well = 0.653 gal/linear ft.			6" well = 1.469 gal/linear ft.			

Quarterly Monitoring Data Sheet						
Date: <u>6/26/98</u>			Well Diameter: <u>2 Inches</u> Well ID: <u>MW-5</u>			
Project Location: <u>Motor Partners Site</u> <u>1234 40th Ave., Oakland</u>			Well Type: <u>Monitoring Well</u>			
Sampler: <u>G. Rogers</u>			Total Depth as Built: <u>21 ft</u>			
			Screened Interval: <u>6 ft to 21 ft</u>			
Water Level Data			Purge Calculation (Min 3 Casing Volumes)			
Time Depth Sounded: <u>10:30 AM</u>			gal/ft X ft = gal X 3 = gal			
Measured Depth to Water: <u>7.07 ft.</u>			0.163 X 11.4 = 1.9 X 3 = 5.6			
Measured Total Depth: <u>18.5 ft.</u>						
Purge Data						
Time	Flowrate (gpm)	Volume (gal)	Temp (°C)	EC (µs/cm)	pH	Turbidity (NTU)
10:47		0	19.1	555	6.89	> 1000
10:57		2	18.6	545	7.38	> 1000
11:08		4	18.4	556	7.35	780
11:14		6	18.3	562	7.37	10
<b>Observations/Comments:</b>						
Inside Building						
<b>Laboratory Analysis:</b>						
Sample at 1:00 PM						
Water depth -						
Analyze for TPH-D, TPH-G, BTEX and MTBE; Nitrate, Ammonia, Total Phosphorus, Ferrous Iron, Sulfate, REDOX, and Dissolved Oxygen.						
<b>Data for Volume Calculation:</b>						
1 cu. ft. = 7.48 gal = 62.4 lbs (approx)			1 gal = 0.134 cu. ft. = 8.34 lbs (approx)			
2" well = 0.163 gal/linear ft.			3" well = 0.367 gal/linear ft.			
4" well = 0.653 gal/linear ft.			6" well = 1.469 gal/linear ft.			