

3315 Almaden Expressway, Suite 34  
San Jose, CA 95118  
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FAX: (408) 264-2435

LETTER REPORT  
QUARTERLY GROUNDWATER MONITORING  
Third Quarter 1993  
at  
ARCO Station 2185  
9800 East 14th Street  
Oakland, California

62026.04

ALCO  
HAZMAT  
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3315 Almaden Expressway, Suite 34  
San Jose, CA 95118  
Phone: (408) 264-7723  
FAX: (408) 264-2435

December 29, 1993  
3rdqtrqm  
62026.04

Mr. Michael Whelan  
ARCO Products Company  
P.O. Box 5811  
San Mateo, California 94402

**Subject:** Letter Report, Quarterly Groundwater Monitoring, Third Quarter 1993 at  
ARCO Station 2185, 9800 East 14th Street, Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) presents this letter report which summarizes the results of third quarter 1993 groundwater monitoring performed by EMCON Associates (EMCON) of San Jose, California at the above-referenced site. The objectives of this quarterly groundwater monitoring event are to evaluate changes in the groundwater flow direction and gradient, and changes in concentrations of gasoline hydrocarbons in the local groundwater associated with former underground gasoline-storage tanks (USTs) at the site. Field work performed under the direction of EMCON included: measuring depths to groundwater; subjectively analyzing groundwater for the presence of gasoline product; collecting groundwater samples from wells MW-1 through MW-7 for laboratory analyses; and directing a State-certified laboratory to analyze the groundwater samples. Evaluation and warrant of field procedures, acquisition of field data, and field protocols, performed by EMCON, is beyond RESNA's scope of work. RESNA's scope of work was limited to interpreting field and laboratory analytical data, which included evaluating trends in reported hydrocarbon concentrations in the local groundwater, the groundwater gradient, and direction of groundwater flow beneath the site.

The operating ARCO Station 2185 is located on the southeastern corner of the intersection of 98th Avenue and East 14th Street in Oakland, California, as shown on the Site Vicinity Map, Plate 1.

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

December 29, 1993  
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Previous environmental work at the site is summarized in RESNA's Initial Subsurface Investigation Report (RESNA, September 1992), and in reports listed in the References section.

### **Groundwater Sampling and Gradient Evaluation**

Depth to water level (DTW) measurements of groundwater monitoring wells MW-1 through MW-7 were performed by EMCON field personnel on July 28, August 23, and September 28, 1993. Quarterly sampling was performed by EMCON field personnel on August 23, 1993. The results of EMCON's field work on the site, including DTW measurements and subjective analysis for the presence of product in the groundwater in wells MW-1 through MW-7, are presented on EMCON's Field Reports, Summary of Groundwater Monitoring Data, and Water Sample Field Data Sheets. These data are included in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective observations of product in the groundwater (if present) from MW-1 through MW-7 for this quarter and previous quarters are summarized in Table 1, Cumulative Groundwater Monitoring Data. EMCON's DTW measurements were used to evaluate groundwater elevations, gradients, and flow directions in July, August, and September 1993. No evidence of floating hydrocarbon product or sheen was observed in the wells during this quarter (see EMCON's Field Report Sheets, Appendix A). The groundwater gradients interpreted for July, August, and September 1993, are shown on Groundwater Gradient Maps, Plates 3 through 5. The average interpreted groundwater gradient for July, August, and September is approximately 0.004 ft/ft with a flow direction to the southwest. The groundwater gradients and flow directions evaluated for this quarter indicate a shift in flow direction to the south from the last quarter.

Groundwater monitoring wells MW-1 through MW-7 were purged and sampled by EMCON field personnel on August 23, 1993. EMCON's Water Sample Field Data Sheets are included in Appendix A. The purge water was removed from the site by a licensed hazardous waste hauler.

### **Laboratory Methods and Results**

Water samples collected from wells MW-1 through MW-7 were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification No. 1426) for benzene, toluene, ethylbenzene, total xylenes (BTEX) and total petroleum hydrocarbons as gasoline (TPHg) using Environmental Protection Agency (EPA) Methods 5030/8020/California DHS LUFT Method. Results of these water analyses are summarized in Table 2, Cumulative Results of Laboratory Analyses of

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

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Groundwater Samples--TPHg and BTEX. Concentrations of TPHg and benzene in the groundwater are shown on Plate 6, TPHg/Benzene Concentrations in Groundwater. The Chain of Custody Records and Laboratory Analysis Reports are included in Appendix A.

The following trends in concentrations of TPHg and BTEX have been identified since the last quarter: concentrations of TPHg and BTEX have decreased in wells MW-2 and MW-6; concentrations of TPHg and BTEX have increased in wells MW-5 and MW-7; concentrations of TPHg, toluene and xylenes have decreased, while benzene and ethylbenzene have increased, in well MW-3; and concentrations of TPHg and BTEX have remained nondetected in wells MW-1 and MW-4. The laboratory reported that the TPHg chromatograph pattern in groundwater from offsite monitoring well MW-7 did not match the typical gasoline fingerprint.

Distribution

It is recommended that copies of this report be forwarded to:

Mr. Barney Chan  
Alameda County Health Care Services Agency  
Department of Environmental Health  
80 Swan Way, Room 200  
Oakland, California 94621

Mr. Richard Hiatt  
Regional Water Quality Control Board  
San Francisco Bay Region  
2101 Webster Street, Suite 500  
Oakland, California 94612

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

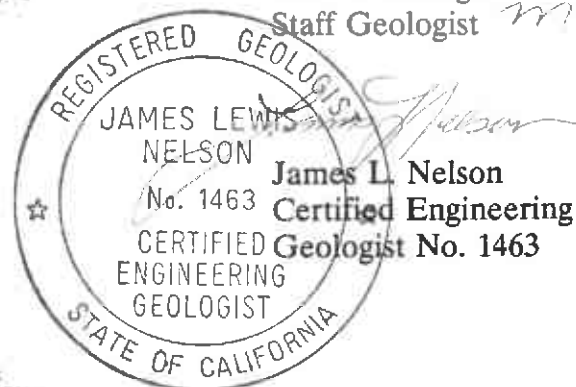
December 29, 1993  
62026.04

If you have any questions or comments, please call us at (408) 264-7723.

Sincerely,  
RESNA Industries Inc.

*Erin D. Krueger*

Erin D. Krueger  
Staff Geologist *mn*



Enclosures: References

Plate 1, Site Vicinity Map  
Plate 2, Generalized Site Plan  
Plate 3, Groundwater Gradient Map, July 28, 1993  
Plate 4, Groundwater Gradient Map, August 23, 1993  
Plate 5, Groundwater Gradient Map, September 28, 1993  
Plate 6, TPHg/Benzene Concentrations in Groundwater, August 23, 1993

Table 1, Cumulative Groundwater Monitoring Data  
Table 2, Cumulative Results of Laboratory Analyses of Groundwater Samples-  
TPHg and BTEX.

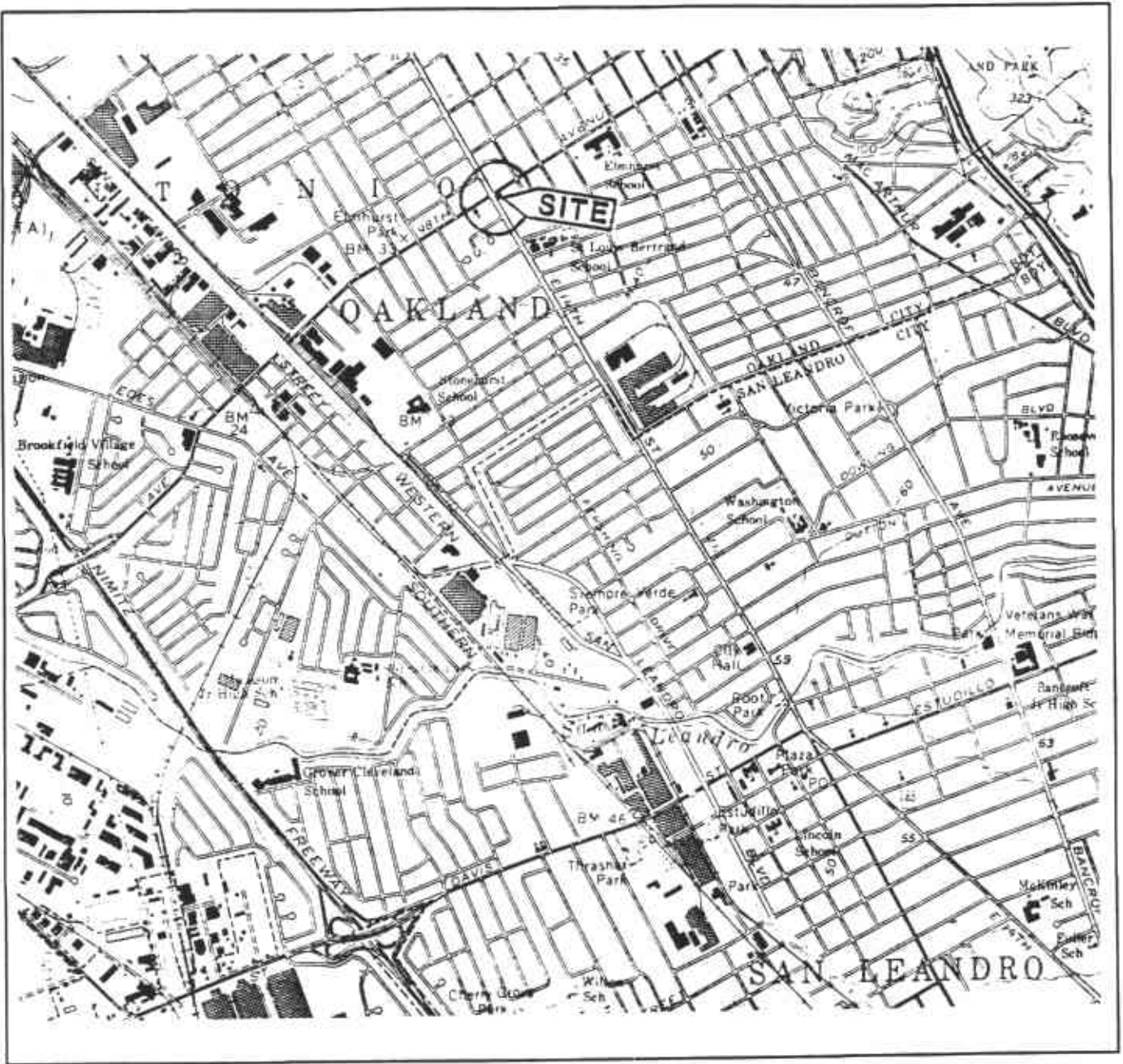
Appendix A: EMCON's Field Reports, EMCON's Water Sample Field Data  
Sheets, and Certified Analytical Reports with Chain of Custody  
Record

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

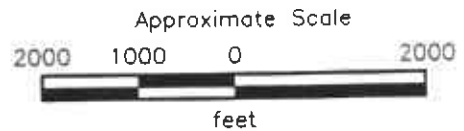
December 29, 1993  
62026.04

**REFERENCES**

- RESNA, June 16, 1992. Site Safety Plan for ARCO Station 2185, 9800 E. 14th Street, Oakland California. 62026.01.
- RESNA, September 28, 1992. Initial Subsurface Investigation at ARCO Station 2185, 9800 East 14th Street, Oakland, California. 62026.01.
- RESNA, December 4, 1992. Letter Report Quarterly Groundwater Monitoring Third Quarter 1992 at ARCO Station 2185, 9800 East 14th Street, Oakland California. 62026.03
- RESNA, March 15, 1993. Letter Report Quarterly Groundwater Monitoring Fourth Quarter 1992 at ARCO Station 2185, 9800 East 14th Street, Oakland California. 62026.03
- RESNA, April 21, 1993. Letter Report Quarterly Groundwater Monitoring First Quarter 1993 at ARCO Station 2185, 9800 East 14th Street, Oakland California. 62026.04
- RESNA, July 24, 1993. Letter Report Quarterly Groundwater Monitoring Second Quarter 1993 at ARCO Station 2185, 9800 East 14th Street, Oakland California. 62026.04
- RESNA, October 12, 1993. Report of Findings, Initial Offsite and Additional Onsite Subsurface Investigation and Aquifer Pumping Test at ARCO Station 2185, 9800 East 14th Street, Oakland, California. 62026.02
- Roux, July 16, 1991. Letter Report Limited Soil Performance Test, ARCO Facility No. 2185, 9800 East 14th Street, Oakland, California. Doc #A102W02.1.1
- Roux, August 8, 1991. Preliminary Tank Replacement Assessment, ARCO Facility No. 2185, 9800 East 14th Street, Oakland, California. Doc #A102W01.1.8
- Roux, November 22, 1991. Limited Subsurface Soil Investigation, ARCO Facility No. 2185, 9800 East 14th Street, Oakland, California. Doc #A102W03.1.1
- Roux, December 18, 1991. Site Investigation Work Plan, ARCO Facility No. 2185, 9800 East 14th Street, Oakland California. Doc #A119W02.1.1
- Roux, June 17, 1992. Underground Storage Tank Removal and Soil Sampling, ARCO Facility No. 2185, East 14th Street, Oakland California. Doc #A119W01.1.2



Source: U.S. Geological Survey  
 7.5-Minute Quadrangle  
 San Leandro, California  
 Photorevised 1980



**RESNA**  
 Working to Restore Nature

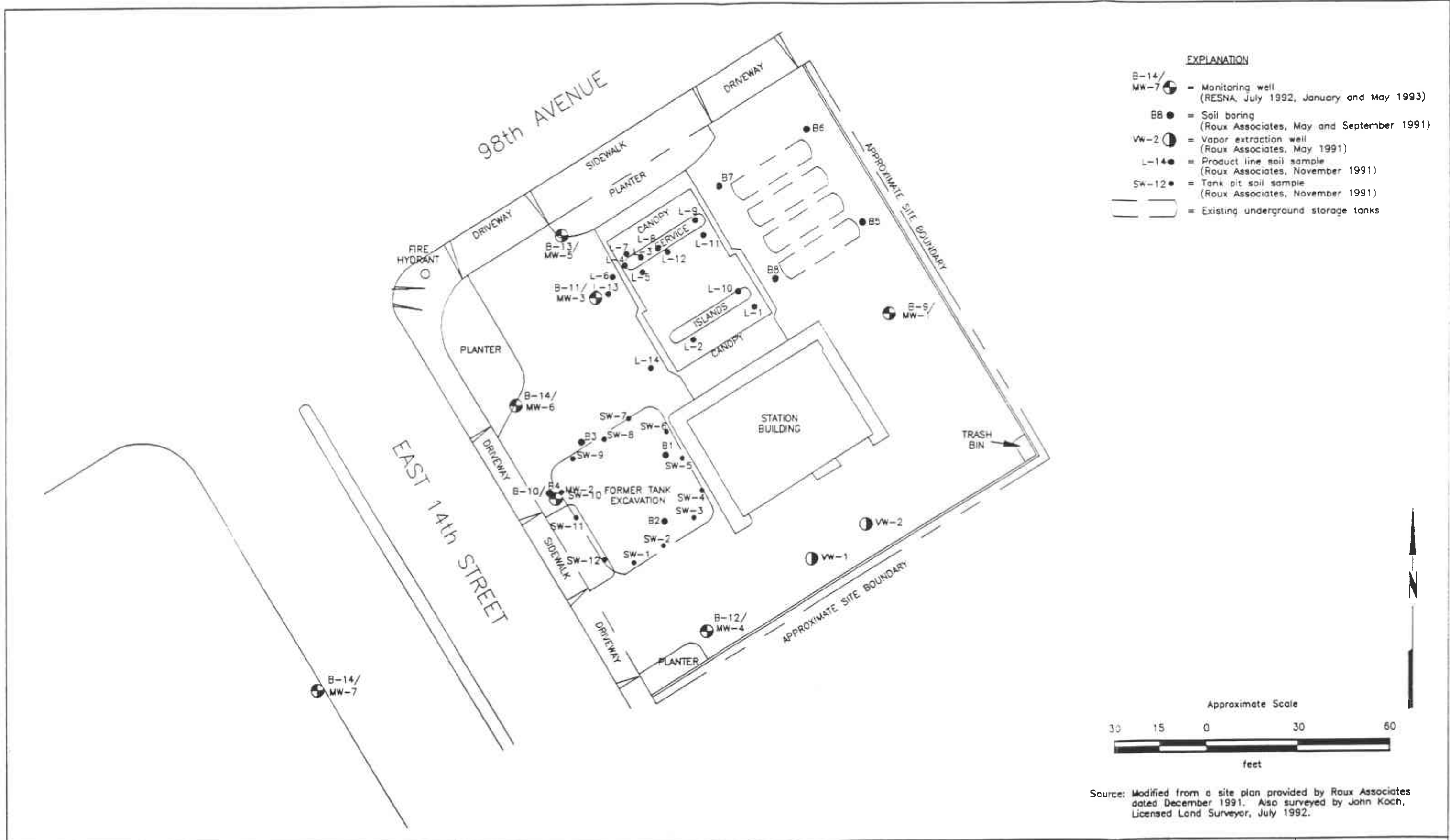
SITE VICINITY MAP  
 ARCO Station 2185  
 9800 East 14th Street  
 San Leandro, California

PLATE

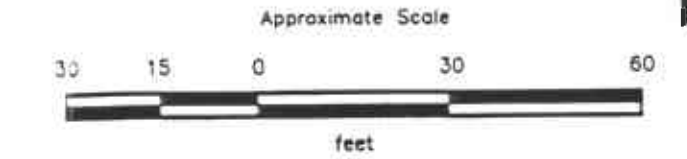
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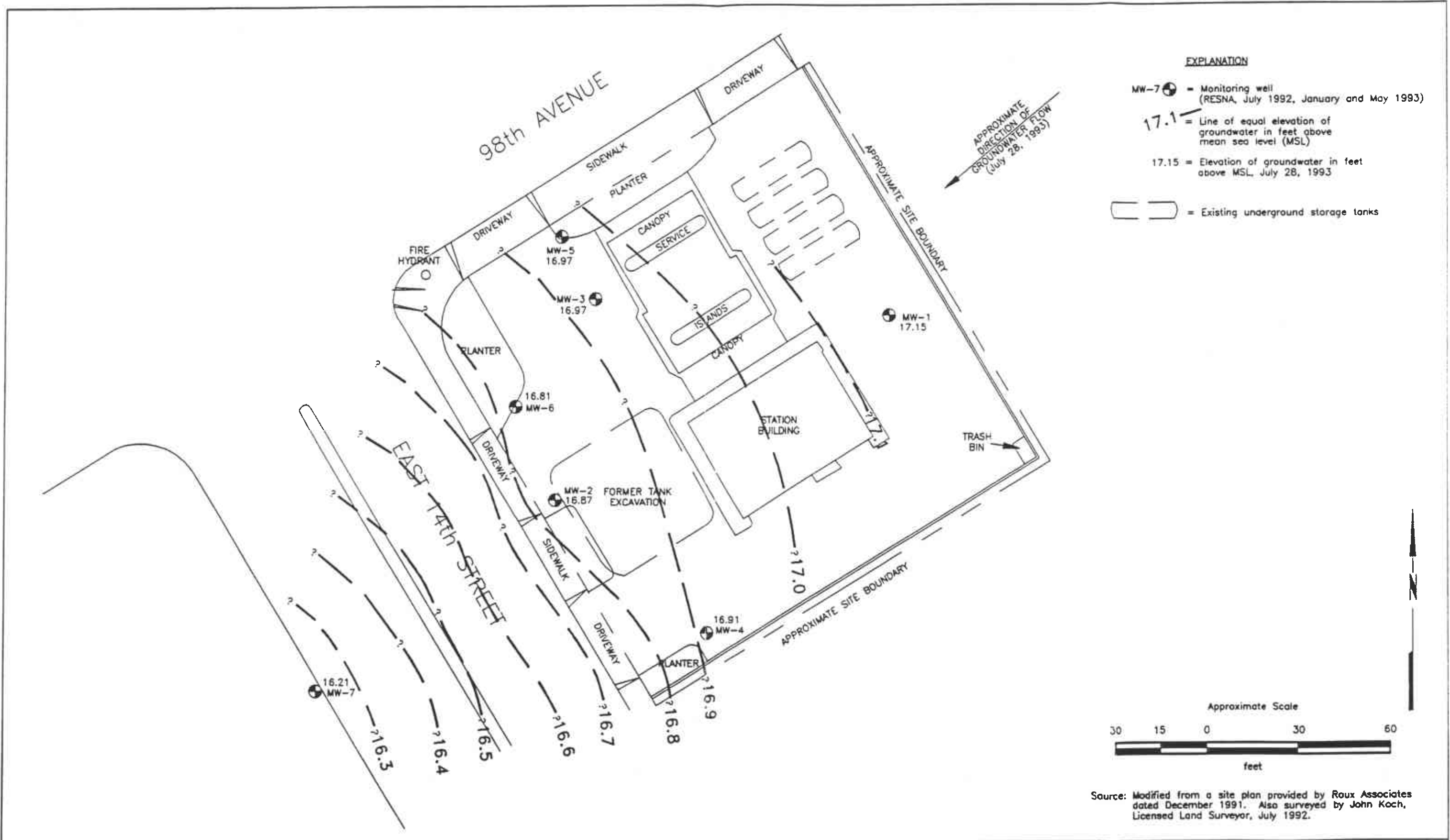


- EXPLANATION**
- B-14/  
MW-7 = Monitoring well  
(RESNA, July 1992, January and May 1993)
  - B8 = Soil boring  
(Roux Associates, May and September 1991)
  - VW-2 = Vapor extraction well  
(Roux Associates, May 1991)
  - L-14 = Product line soil sample  
(Roux Associates, November 1991)
  - SW-12 = Tank pit soil sample  
(Roux Associates, November 1991)
  - = Existing underground storage tanks



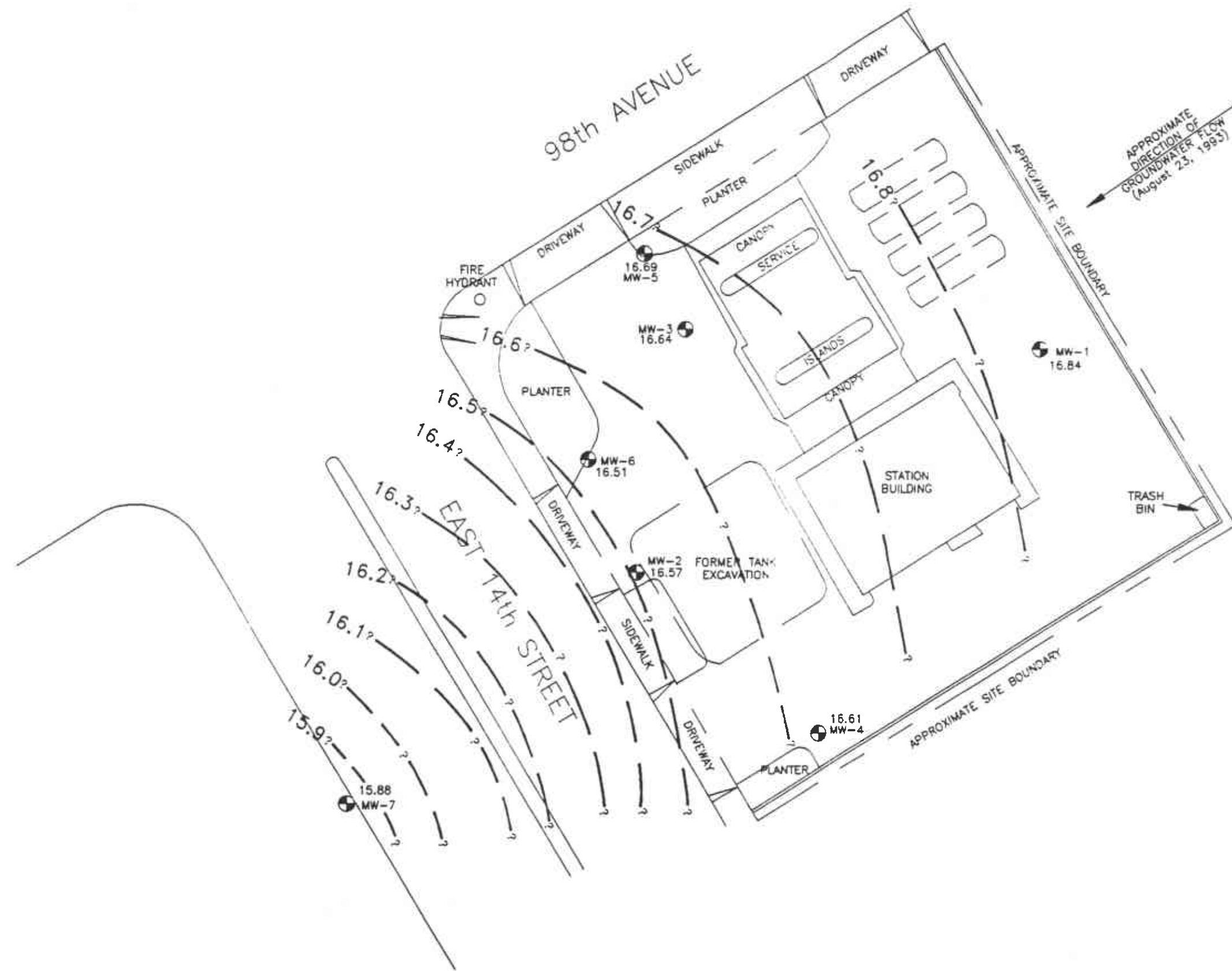
Source: Modified from a site plan provided by Roux Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.





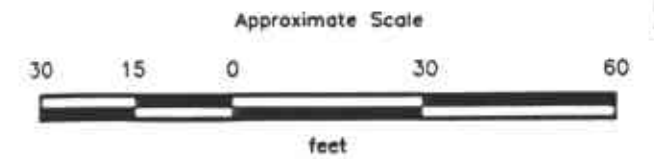
**GROUNDWATER GRADIENT MAP**  
**ARCO Station 2185**  
**9800 East 14th Street**  
**Oakland, California**

**PLATE**  
**3**



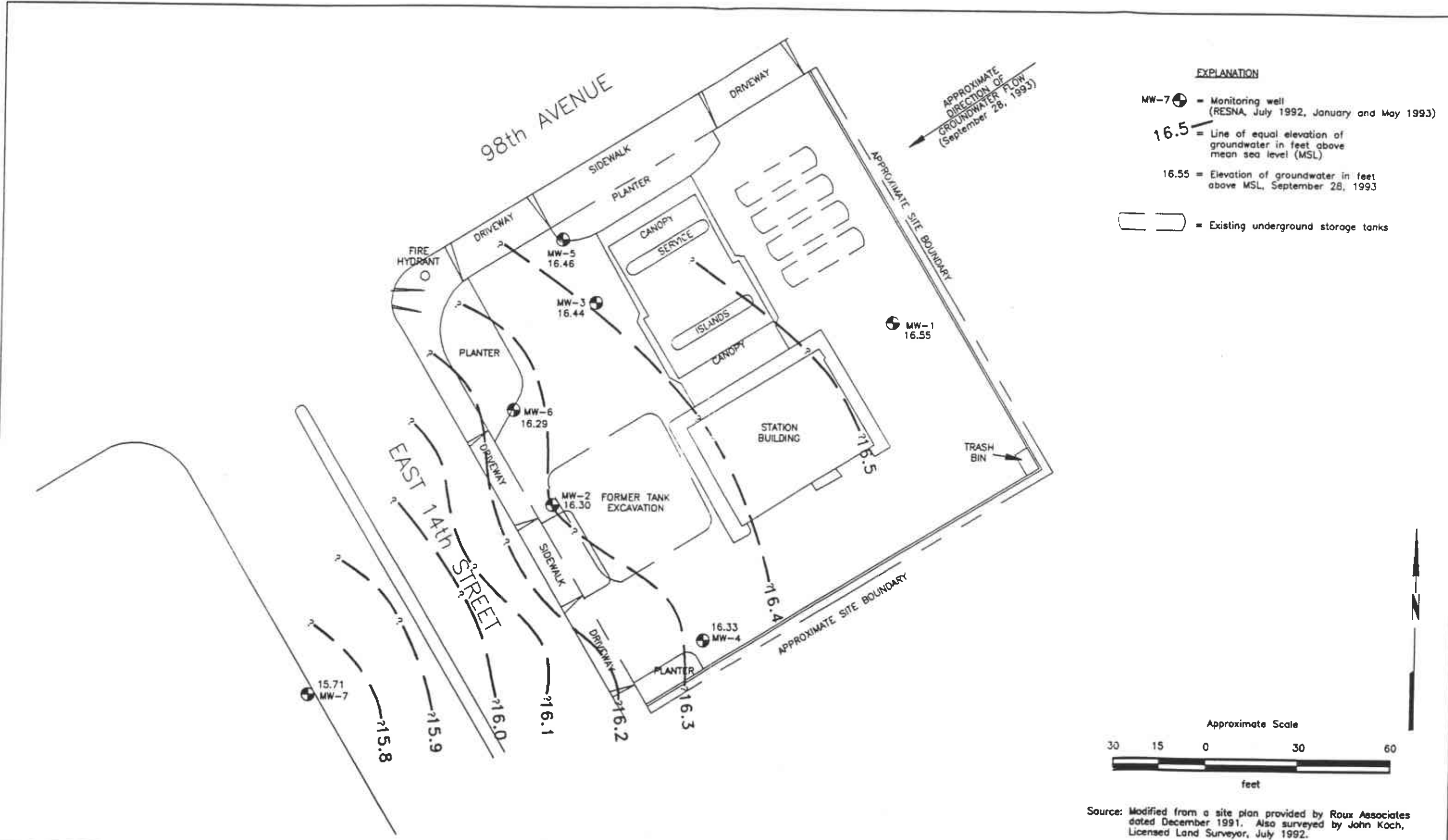
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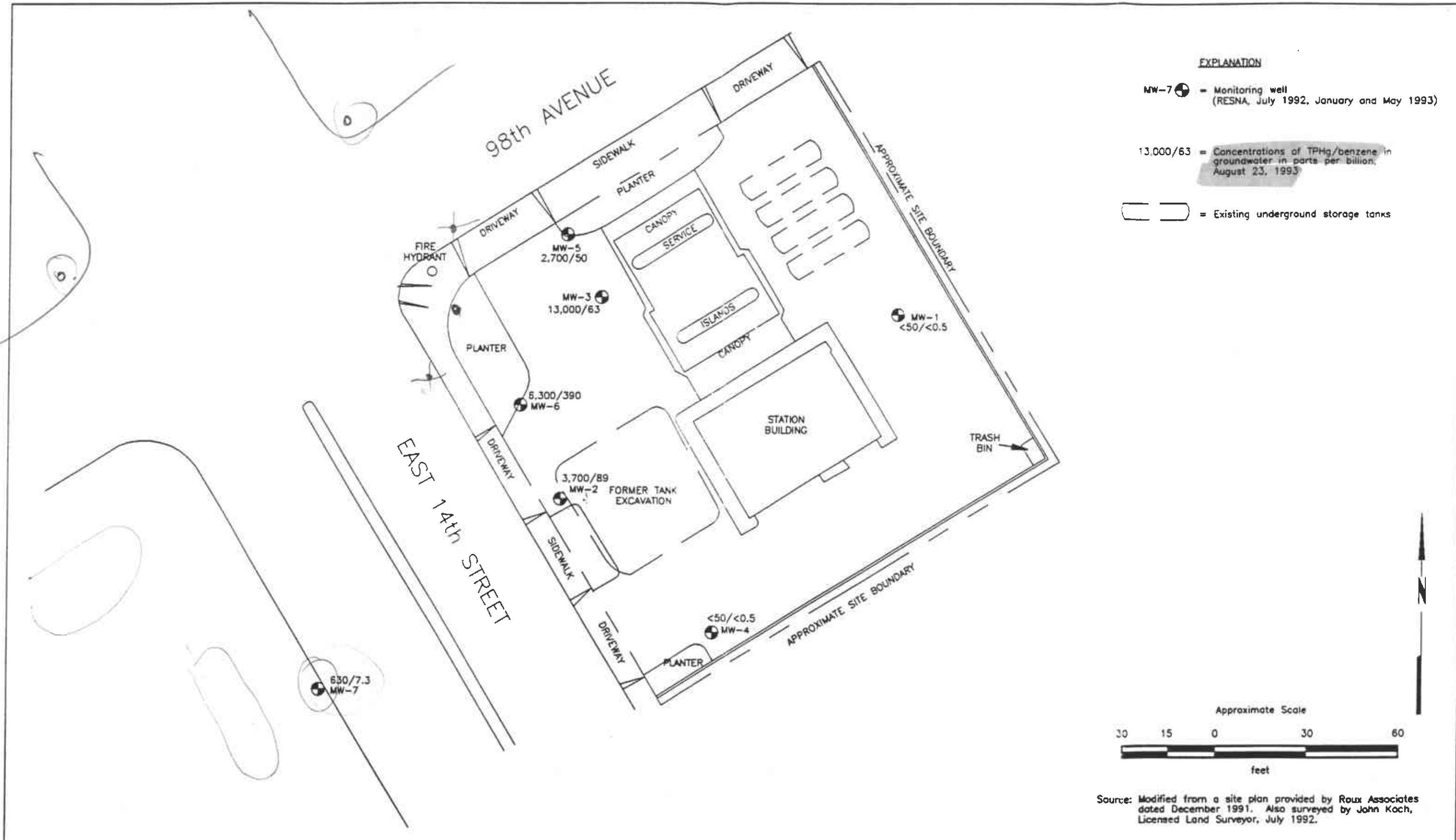
- MW-7 = Monitoring well (RESNA, July 1992, January and May 1993)
- 16.8 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 16.84 = Elevation of groundwater in feet above MSL, August 23, 1993
- = Existing underground storage tanks



Source: Modified from a site plan provided by Raux Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.







PROJECT 62026.04

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TPHg/BENZENE CONCENTRATIONS  
 IN GROUNDWATER  
 ARCO Station 2185  
 9800 East 14th Street  
 Oakland, California

PLATE

6

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

December 29, 1993  
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TABLE 1  
CUMULATIVE GROUNDWATER MONITORING DATA  
ARCO Station 2185  
Oakland, California  
(Page 1 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-1</u>				
7-24-92	29.15	13.38	15.77	None
8-26-92		13.92	15.23	None
9-22-92		14.18	14.97	None
10-19-92		14.52	14.63	None
11-23-92		14.54	14.61	None
12-16-92		12.20	16.95	None
01-14-93		9.32	19.83	None
02-26-93		9.38	19.77	None
03-26-93		10.04	19.11	None
04-09-93		10.50	18.65	None
05-19-93		11.26	17.89	None
06-17-93		11.53	17.62	None
07-28-93		12.00	17.15	None
08-23-93	12.31	16.84	None	
09-28-93	12.60	16.55	None	
<u>MW-2</u>				
7-24-92	28.47	12.95	15.52	None
8-26-92		13.55	14.92	None
9-22-92		13.78	14.69	None
10-19-92		14.09	14.38	None
11-23-92		14.06	14.41	None
12-16-92		11.70	16.77	None
01-14-93		8.87	19.60	None
02-26-93		8.98	19.49	None
03-26-93		9.57	18.90	None
04-09-93		10.02	18.45	None
05-19-93		10.81	17.66	None
06-17-93		11.08	17.39	None
07-28-93		11.60	16.87	None
08-23-93	11.90	16.57	None	
09-28-93	12.17	16.30	None	
<u>MW-3</u>				
7-24-92	28.57	12.90	15.67	Sheen
8-26-92		13.51	15.06	None
9-22-92		13.73	14.84	None
10-19-92		14.04	14.53	None
11-23-92		14.02	14.55	None
12-16-92		11.73	16.84	None
01-14-93	9.17	19.40	None	

See notes on page 3 of 3

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

December 29, 1993  
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TABLE 1  
CUMULATIVE GROUNDWATER MONITORING DATA  
ARCO Station 2185  
Oakland, California  
(Page 2 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<b>MW-3 cont.</b>				
02-26-93		9.30	19.27	None
03-26-93		9.83	18.74	None
04-09-93		10.22	18.35	None
05-19-93		10.91	17.66	None
06-17-93		10.74	17.83	None
07-28-93		11.60	16.97	None
08-23-93		11.93	16.64	None
09-28-93		12.13	16.44	None
<b>MW-4</b>				
7-24-92	29.21	13.68	15.53	None
8-26-92		14.12	15.09	None
9-22-92		14.46	14.75	None
10-19-92		14.74	14.47	None
11-23-92		14.75	14.46	None
12-16-92		12.45	16.76	None
01-14-93		9.46	19.75	None
02-26-93		9.54	19.67	None
03-26-93		10.19	19.02	None
04-09-93		10.67	18.54	None
05-19-93		11.52	17.69	None
06-17-93		11.79	17.42	None
07-28-93		12.30	16.91	None
08-23-93		12.60	16.61	None
09-28-93		12.88	16.33	None
<b>MW-5</b>				
02-26-93	28.12	9.00	19.12	None
03-26-93		9.41	18.71	None
04-09-93		9.80	18.32	None
05-19-93		10.50	17.62	None
06-17-93		10.73	17.39	None
07-28-93		11.15	16.97	None
08-23-93		11.43	16.69	None
09-28-93		11.66	16.46	None

See notes on page 3 of 3

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

December 29, 1993  
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TABLE 1  
CUMULATIVE GROUNDWATER MONITORING DATA  
ARCO Station 2185  
Oakland, California  
(Page 3 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
<u>MW-6</u>				
02-26-93	27.79	8.47	19.32	None
03-26-93		9.07	18.72	None
04-09-93		9.53	18.26	None
05-19-93		10.23	17.56	None
06-17-93		10.51	17.28	None
07-28-93		10.98	16.81	None
08-23-93		11.28	16.51	None
09-28-93		11.50	16.29	None
<u>MW-7</u>				
07-28-93	27.88	11.67	16.21	None
08-23-93		12.00	15.88	None
09-28-93		12.17	15.71	None

All measurements in feet.

Well Elevation if top-of-casing (TOC) in feet above mean sea level (msl).

Depth-to-Water (DTW) is measured in feet below TOC

Groundwater Elevation = TOC - DTW

Floating Product = Subjective evidence of floating product noted.

Wells MW-1 through MW-4 surveyed on July 23, 1992, wells MW-5 through MW-7 surveyed on May 11, 1993 (Benchmark #24/D, near the corner of 98th Avenue [5' feet west of west curb] and East 14th Street [7' feet east of the south curb] in Oakland).

Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

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TABLE 2  
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF  
GROUNDWATER SAMPLES-TPHg AND BTEX  
ARCO Station 2185  
Oakland, California  
(Page 1 of 2)

Well	TPHg	B	T	E	X
<b>MW-1</b>					
7-24-92	<50	<0.5	<0.5	<0.5	<0.5
10-19-92	<50	<0.5	<0.5	<0.5	<0.5
01-14-93	<50	<0.5	<0.5	<0.5	<0.5
04-09-93	<50	<0.5	<0.5	<0.5	<0.5
08-23-93	<50	<0.5	<0.5	<0.5	<0.5
<b>MW-2</b>					
7-24-92	5,900	510	<10*	370	430
10-19-92	4,100	110	<10*	100	62
01-14-93	12,000	700	10	720	680
04-09-93	8,400	220	<10*	480	320
08-23-93	3,700	89	<5*	230	150
<b>MW-3</b>					
7-24-92		Not sampled - sheen			
10-19-92	42,000	740	1,100	1,500	5,700
01-14-93	44,000	1,100	840	2,200	9,600
04-09-93	21,000	33	69	350	1,600
08-23-93	13,000	63	21	530	1,300
<b>MW-4</b>					
7-24-92	<50	<0.5	<0.5	<0.5	<0.5
10-19-92	<50	<0.5	<0.5	<0.5	<0.5
01-14-93	<50	<0.5	<0.5	<0.5	<0.5
04-09-93	<50	<0.5	<0.5	<0.5	<0.5
08-23-93	<50	<0.5	<0.5	<0.5	<0.5
<b>MW-5</b>					
02-11-93	9,300	620	<50*	890	2,200
04-09-93	960	29	<1*	100	96
08-23-93	2,700	50	<2.5*	260	250
<b>MW-6</b>					
02-11-93	4,800	630	<10*	490	460
04-09-93	13,000	880	<10*	1,000	1,000
08-23-93	6,300	390	<20*	450	390
<b>MW-7</b>					
05-14-93	350	0.83	<0.50	<0.50	<0.50
08-23-93	630**	7.3	<1*	<1*	<1*
MCL	—	1.0	—	680	1,750
DWAL	—	—	100	—	—



Quarterly Groundwater Monitoring  
ARCO Station 2185, Oakland, California

December 29, 1993  
62026.04

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TABLE 2  
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF  
GROUNDWATER SAMPLES-TPHg AND BTEX  
ARCO Station 2185  
Oakland, California  
(Page 2 of 2)

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Results in parts per billion (ppb).

TPHg = Total petroleum hydrocarbons as gasoline using EPA Method 5030/8020/DHS LUFT.

B = benzene, T = toluene, E = ethylbenzene, X = total xylenes using EPA Method 5030/8020/DHS LUFT

< = Below indicated laboratory detection limits.

\* = Laboratory raised Method Reporting Limit (MRL) due to high analyte concentration requiring sample dilution.

\*\* = According to the laboratory, the sample contains components eluting in the gasoline range that were quantitated as gasoline. The chromatogram does not match the typical gasoline fingerprint.

MCL = State Maximum Contaminant Level (California Department of Health Services, October 1990).

DWAL = State Recommended Drinking Water Action Level (California Department of Health Services, October 1990).

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**APPENDIX A**

**EMCON'S FIELD REPORTS, WATER SAMPLE FIELD DATA SHEETS,  
AND CERTIFIED ANALYTICAL REPORTS WITH CHAIN OF CUSTODY  
RECORD**



# EMCON Associates

1938 Junction Avenue • San Jose, California 95131-2102 • (408) 453-0719 • Fax (408) 453-0452

Date August 5, 1993  
Project OG70-054.01

To:  
Mr. John Young  
RESNA  
3315 Almaden Expressway, Suite 34  
San Jose, California 95118

We are enclosing:

Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Results</u>
<u>      </u>	<u>July 1993 monthly water level survey, ARCO</u>
<u>      </u>	<u>station 2185, 9800 East 14th Street, Oakland, CA</u>

For your:   X   Information      Sent by:   X   Mail

Comments:

Monthly water level data for the above mentioned site are attached. Please call if you have any questions: (408) 453-2266.

Reviewed by:



Jim Butera *JB*

Robert Porter  
Robert Porter, Senior Project Engineer.



**FIELD REPORT  
DEPTH TO WATER / FLOATING PRODUCT SURVEY**

PROJECT # : 0G70-054.01

STATION ADDRESS : 9800 East 14th Street, Oakland

DATE : July 28, 1993

ARCO STATION # : 2185

FIELD TECHNICIAN : Jan Graham / Steve Horton

DAY : Wednesday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-1	good	15/16	na	3259	yes	12.00	12.00	ND	ND	23.6	—
2	MW-4	good	15/16	na	3259	yes	12.30	12.30	ND	ND	23.9	—
3	MW-5	good	15/16	na	3259	yes	11.15	11.15	ND	ND	26.8	soft bottom
4	MW-2	good	15/16	na	3259	yes	11.60	11.60	ND	ND	23.6	—
5	MW-6	good	15/16	na	3259	yes	10.98	10.98	ND	ND	27.8	—
6	MW-3	good	15/16	na	3259	yes	11.60	11.60	ND	ND	23.2	moderate odor
7	MW-7	good	15/16	na	Delphin	yes	11.67	11.67	ND	ND	25.3	—

**SURVEY POINTS ARE TOP OF WELL CASINGS**



# EMCON Associates

1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

Date September 30, 1993

Project 0G70-054.01

To:

Mr. John Young

RESNA

3315 Almaden Expressway, Suite 34

San Jose, California 95118

We are enclosing:

Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Results</u>
<u>          </u>	<u>September 1993 monthly water level survey, ARCO</u>
<u>          </u>	<u>station 2185, 9800 East 14th Street, Oakland, CA</u>

For your:   X   Information      Sent by:   X   Mail

Comments:

Monthly water level data for the above mentioned site are attached. Please call if you have any questions: (408) 453-2266.

Reviewed by:



Jim Butera JB

Robert Porter

Robert Porter, Senior Project Engineer.



**FIELD REPORT  
DEPTH TO WATER / FLOATING PRODUCT SURVEY**

PROJECT # : OG70-054.01

STATION ADDRESS : 9800 East 14th Street, Oakland

DATE : 8-27-93 <sup>63</sup>

ARCO STATION # : 2185

FIELD TECHNICIAN : M. Gallegos

DAY : Monday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-1	good	15/16	good	3259	good	12.31	12.31	ND	NR	23.6	---
2	MW-4	good	15/16	good	3259	good	12.60	12.60	ND	NR	23.8	---
3	MW-5	good	15/16	good	3259	good	11.43	11.43	ND	NR	26.7	---
4	MW-2	good	15/16	good	3259	good	11.90	11.90	ND	NR	23.6	---
5	MW-6	good	15/16	good	3259	good	11.28	11.28	ND	NR	27.7	---
6	MW-3	good	15/16	good	3259	good	11.93	11.93	ND	NR	23.2	---
7	MW-7	good	15/16	good	<del>3259</del>	good	12.00	12.00	ND	NR	25.3	---
						ob/prim						

**SURVEY POINTS ARE TOP OF WELL CASINGS**

Summary of Groundwater Monitoring Data  
 Third Quarter 1993  
 ARCO Service Station 2185  
 9800 East 14th Street, Oakland, California  
 micrograms per liter ( $\mu\text{g/l}$ ) or parts per billion (ppb)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH <sup>1</sup> as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)
MW-1(23)	08/23/93	12.31	ND. <sup>2</sup>	<50.	<0.5	<0.5	<0.5	<0.5
MW-2(23)	08/23/93	11.90	ND.	3,700.	89.	<5.	230.	150.
MW-3(23)	08/23/93	11.93	ND.	13,000.	63.	21.	530.	1,300.
MW-4(23)	08/23/93	12.60	ND.	<50.	<0.5	<0.5	<0.5	<0.5
MW-5(26)	08/23/93	11.43	ND.	2,700.	50.	<2.5	260.	250.
MW-6(27)	08/23/93	11.28	ND.	6,300.	390.	<20.	450.	390.
MW-7(25)	08/23/93	12.00	ND.	630.	7.3	<1.	<1.	<1.

1. TPH. = Total petroleum hydrocarbons

2. ND. = Not detected

**Columbia  
Analytical  
Services<sup>INC.</sup>**

September 8, 1993

Service Request No. SJ93-1046

Jim Butera  
EMCON Associates  
1921 Ringwood Avenue  
San Jose, CA 95131

Re: EMCON Project No. 0G70-054.01  
ARCO Facility No. 2185

Dear Mr. Butera:

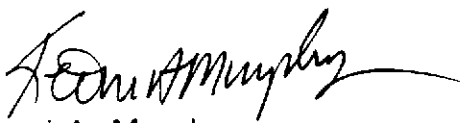
Attached are the results of the water samples submitted to our lab on August 24, 1993. For your reference, these analyses have been assigned our service request number SJ93-1046.

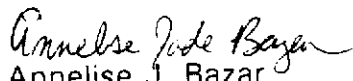
All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

  
Keoni A. Murphy  
Laboratory Manager

  
Annelise J. Bazar  
Regional QA Coordinator

KAM/drf



# COLUMBIA ANALYTICAL SERVICES, Inc.

## Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NR	Not Requested
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates  
 Project: EMCON Project No. OG70-054.01  
 ARCO Facility No. 2185

Date Received: 08/24/93  
 Service Request No.: SJ93-1046  
 Sample Matrix: Water

BTEX and TPH as Gasoline  
 EPA Methods 5030/8020/California DHS LUFT Method  
 µg/L (ppb)

Sample Name: MW-1 (23)      MW-3 (23)      MW-2 (23)  
 Date Analyzed: 09/03/93      09/03/93      09/03/93

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	ND	63.	89.
Toluene	0.5	ND	21.	< 5. *
Ethylbenzene	0.5	ND	530.	230.
Total Xylenes	0.5	ND	1,300.	150.
TPH as Gasoline	50	ND	13,000.	3,700.

Sample Name: MW-4 (23)      MW-5 (26)      MW-6 (27)  
 Date Analyzed: 09/03/93      09/03/93      09/03/93

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	ND	50.	390.
Toluene	0.5	ND	< 2.5 *	< 20. *
Ethylbenzene	0.5	ND	260.	450.
Total Xylenes	0.5	ND	250.	390.
TPH as Gasoline	50	ND	2,700.	6,300.

\* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: *Keon Murphy*      Date: September 8, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates  
Project: EMCON Project No. 0G70-054.01  
ARCO Facility No. 2185

Date Received: 08/24/93  
Service Request No.: SJ93-1046  
Sample Matrix: Water

BTEX and TPH as Gasoline  
EPA Methods 5030/8020/California DHS LUFT Method  
 $\mu\text{g/L}$  (ppb)

Sample Name: MW-7 (25)      Method Blank  
Date Analyzed: 09/03/93      09/03/93

<u>Analyte</u>	<u>MRL</u>		
Benzene	0.5	7.3	ND
Toluene	0.5	<1. *	ND
Ethylbenzene	0.5	<1. *	ND
Total Xylenes	0.5	<1. *	ND
TPH as Gasoline	50	630. **	ND

- \* Raised MRL due to high analyte concentration requiring sample dilution.
- \*\* The sample contains components eluting in the gasoline range that were quantitated as gasoline. The chromatogram does not match the typical gasoline fingerprint.

Approved by: *Keon Ampling*      Date: September 8, 1993

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates  
Project: EMCON Project No. OG70-054.01  
ARCO Facility No. 2185

Date Received: 08/24/93  
Service Request No.: SJ93-1046  
Sample Matrix: Water

Surrogate Recovery Summary  
BTEX and TPH as Gasoline  
EPA Methods 5030/8020/California DHS LUFT Method

<u>Sample Name</u>	<u>Date Analyzed</u>	<u>Percent Recovery</u> <i>α,α,α-Trifluorotoluene</i>
MW-1 (23)	09/03/93	93.
MW-3 (23)	09/03/93	93.
MW-2 (23)	09/03/93	96.
MW-4 (23)	09/03/93	85.
MW-5 (26)	09/03/93	86.
MW-6 (27)	09/03/93	85.
MW-7 (25)	09/03/93	90.
MW-1 (23) MS	09/03/93	93.
MW-1 (23) DMS	09/03/93	92.
Method Blank	09/03/93	85.

CAS Acceptance Criteria

70-130

Approved by:

*Kearney Murphy*

Date:

*September 8, 1993*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates  
Project: EMCON Project No. 0G70-054.01  
ARCO Facility No. 2185

Date Received: 08/24/93  
Service Request No.: SJ93-1046

Initial Calibration Verification  
BTEX and TPH as Gasoline  
EPA Methods 5030/8020/DHS LUFT Method  
 $\mu\text{g/L}$  (ppb)

Date Analyzed: 09/03/93

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Benzene	25.	27.1	108.	85-115
Toluene	25.	27.2	109.	85-115
Ethylbenzene	25.	27.1	108.	85-115
Total Xylenes	75.	81.8	109.	85-115
TPH as Gasoline	250.	248.	99.	90-110

Approved by:

*Kenneth Murphy*

Date:

*September 8, 1993*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates  
 Project: EMCON Project No. 0G70-054.01  
 ARCO Facility No. 2185

Date Received: 08/24/93  
 Service Request No.: SJ93-1046  
 Sample Matrix: Water

Matrix Spike/Duplicate Matrix Spike Summary  
 BTE  
 EPA Methods 5030/8020  
 µg/L (ppb)

Sample Name: MW-1 (23)  
 Date Analyzed: 09/03/93

Percent Recovery

Analyte	Spike Level	Sample Result	Spike Result		Percent Recovery		CAS Acceptance Criteria
			MS	DMS	MS	DMS	
Benzene	25.	ND	26.1	26.4	104.	106.	76-122
Toluene	25.	ND	25.9	26.4	104.	106.	75-127
Ethylbenzene	25.	ND	25.7	25.9	103.	104.	70-135

Approved by: *Kenneth Murphy*

Date: *September 8, 1993*

**ARCO Products Company**

Division of AtlanticRichfieldCompany

Task Order No. **EMC-935**

**Chain of Custody**

ARCO Facility no. **2185** City (Facility) **OAKLAND** Project manager (Consultant) **JIM BUTERA**  
 ARCO engineer **Kyle Christie** Telephone no (ARCO) **4571-2434** Telephone no (Consultant) **453-0719** Fax no (Consultant) **453-0452**  
 Consultant name **EMCON ASSOCIATES** Address (Consultant) **1938 Junction Avenue San Jose**

Laboratory name **CAS**

Contract number **07077**

Method of shipment **Sampler will deliver**

Sample ID	Lab no	Container no	Matrix			Preservation		Sampling date	Sampling time	BTEX 602 EPA 8020	BTEX TPH EPA 1602 8020 8015	TPH Method 8015 Gas Diesel	Oil and Grease 4131 4132	TPH EPA 418 11SM53E	EPA 601 8010	EPA 624 6240	EPA 625 6270	TCLP Metals VOA VOA	SEM Metals VOA VOA	CAM Metals EPA 6010-7006 TLC STLC	Lead Org DHS Lead EPA 7420 7421	
			Soil	Water	Other	Ice	Acid															
MW 1 (23) 1-2		2		X		X	HCl	8-23-93	1424	X	X											
MW 3 (23) 3-4		2							1344													
MW 2 (23) 5-6		2							1129													
MW 4 (23) 7-8		2							1054													
MW 5 (24) 9-10		2							1258													
MW 6 (24) 11-12		2							1215													
MW (25) 13-14		2							1514													

Special detection Limit/reporting **Lowest Possible**

Special QA/QC **As Normal**

Remarks **2-40ml HCl VOAs**

Lab number **SJ93-1046**

Turnaround time  
 Priority Rush 1 Business Day  
 Rush 2 Business Days  
 Expedited 5 Business Days  
 Standard 10 Business Days

Condition of sample: **OAKLAND**  
 Relinquished by Sampler **[Signature]** Date **8-24-93** Time **08:45**  
 Relinquished by **[Signature]** Date \_\_\_\_\_ Time \_\_\_\_\_  
 Relinquished by \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Temperature received: **COOL**  
 Received by \_\_\_\_\_  
 Received by \_\_\_\_\_  
 Received by laboratory **[Signature]** Date **8-24-93** Time **0845**

**X**



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 0670-054.01

SAMPLE ID: MW-1

PURGED BY: M. Gallegos

CLIENT NAME: ARCOP 2185

SAMPLED BY: M. Gallegos

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4  4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 7.37

DEPTH TO WATER (feet): 12.31 CALCULATED PURGE (gal.): 22.12

DEPTH OF WELL (feet): 23.6 ACTUAL PURGE VOL. (gal.): 22.5

DATE PURGED: ~~8-24-93~~ 8-23-93 Start (2400 Hr) 1405 End (2400 Hr) 1416

DATE SAMPLED: ~~8-24-93~~ 8-23-93 Start (2400 Hr) 1424 End (2400 Hr) \_\_\_\_\_

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1408</u>	<u>7.5</u>	<u>6.89</u>	<u>532</u>	<u>68.1</u>	<u>BRW</u>	<u>Heavy</u>
<u>1412</u>	<u>15.0</u>	<u>6.78</u>	<u>533</u>	<u>67.7</u>	<u>"</u>	<u>"</u>
<u>1416</u>	<u>22.5</u>	<u>6.79</u>	<u>524</u>	<u>67.2</u>	<u>"</u>	<u>"</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: NONE NR NR  
(COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |   |   |  |  |
|---|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump  | <input type="checkbox"/> Bailer (Teflon®)         | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input checked="" type="checkbox"/> Bailer (PVC)  | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailer (Stainless Steel)    |
| <input type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump            |
| <input type="checkbox"/> Well Wizard™     | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                   |
| Other: _____                              |   | Other: _____                             |  |

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: all samples taken

Meter Calibration: Date: 8-23-93 Time: \_\_\_\_\_ Meter Serial #: 4972 Temperature °F: \_\_\_\_\_

( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: MW-4

Signature: M. Gallegos Reviewed By: JB Page 1 of 7





EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev 2, 5/91

PROJECT NO: 0670-054.01

SAMPLE ID: MW-2

PURGED BY: M. Gallegos

CLIENT NAME: ARCO#2185

SAMPLED BY: M. Gallegos

LOCATION: OAKLAND, CA

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4  4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL): <u>NR</u>	VOLUME IN CASING (gal.): <u>7.64</u>
DEPTH TO WATER (feet): <u>1190</u>	CALCULATED PURGE (gal.): <u>22.93</u>
DEPTH OF WELL (feet): <u>23.6</u>	ACTUAL PURGE VOL. (gal.): <u>23.0</u>

DATE PURGED: 8-24-93 8:33-93 Start (2400 Hr) 1110 End (2400 Hr) 1120  
 DATE SAMPLED: 8-24-93 8:33-93 Start (2400 Hr) 1128 End (2400 Hr) \_\_\_\_\_

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1114</u>	<u>8.0</u>	<u>6.67</u>	<u>828</u>	<u>70.8</u>	<u>grey</u>	<u>heavy</u>
<u>1117</u>	<u>16.0</u>	<u>6.70</u>	<u>824</u>	<u>70.2</u>	<u>"</u>	<u>"</u>
<u>1120</u>	<u>23.0</u>	<u>6.71</u>	<u>817</u>	<u>69.9</u>	<u>"</u>	<u>"</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: Strong COLOR (COBALT 0 - 100): NR TURBIDITY (NTU 0 - 200): NR

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailer (Teflon B)	<input type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailer (Teflon B)
<input type="checkbox"/> Centrifugal Pump	<input checked="" type="checkbox"/> Bailer (PVC)	<input type="checkbox"/> DDL Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated
Other: _____		Other: _____	

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: all samples taken  
Screen on top of purge water.  
Water

Meter Calibration: Date: 8-23-93 Time: \_\_\_\_\_ Meter Serial #: 4972 Temperature °F: \_\_\_\_\_  
 (EC 1000 \_\_\_\_\_ / \_\_\_\_\_) (DI \_\_\_\_\_) (pH 7 \_\_\_\_\_ / \_\_\_\_\_) (pH 10 \_\_\_\_\_ / \_\_\_\_\_) (pH 4 \_\_\_\_\_ / \_\_\_\_\_)

Location of previous calibration: MW-4

Signature: M. Gallegos Reviewed By: JB Page 2 of 2



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: OG70-054-01

SAMPLE ID: MW-3

PURGED BY: M. Gallegos

CLIENT NAME: ARCOH 2185

SAMPLED BY: M. Gallegos

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4  4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 7.36  
 DEPTH TO WATER (feet): 11.93 CALCULATED PURGE (gal.): 22.08  
 DEPTH OF WELL (feet): 23.2 ACTUAL PURGE VOL. (gal.): 22.5

DATE PURGED: ~~8-24-93~~ 8-23-93 Start (2400 Hr) 1327 End (2400 Hr) 1338  
 DATE SAMPLED: ~~8-24-93~~ 8-23-93 Start (2400 Hr) 1344 End (2400 Hr) \_\_\_\_\_

TIME (2400 Hr)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1331</u>	<u>7.5</u>	<u>6.81</u>	<u>621</u>	<u>70.8</u>	<u>cloudy</u>	<u>hazy</u>
<u>1334</u>	<u>15.0</u>	<u>6.71</u>	<u>642</u>	<u>69.6</u>	<u>"</u>	<u>"</u>
<u>1338</u>	<u>22.5</u>	<u>6.68</u>	<u>652</u>	<u>69.4</u>	<u>"</u>	<u>"</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

J. O. (ppm): NR ODOR: Strong \_\_\_\_\_  
 (COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |   |   |  |  |
|---|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump  | <input type="checkbox"/> Bailor (Teflon®)         | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailor (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input checked="" type="checkbox"/> Bailor (PVC)  | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailor (Stainless Steel)    |
| <input type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailor (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump            |
| <input type="checkbox"/> Well Wizard™     | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                   |
| Other: _____                              |   | Other: _____                             |  |

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: all samples taken

Meter Calibration: Date: 8-23-93 Time: \_\_\_\_\_ Meter Serial #: 4972 Temperature °F: \_\_\_\_\_

( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: MW-4

Signature: M. Gallegos Reviewed By: JB Page 3 of 7



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 0670-05401

SAMPLE ID: MW-4

PURGED BY: M. Gallegos

CLIENT NAME: ARCO # 2185

SAMPLED BY: M. Gallegos

LOCATION: OAKLAND CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4  4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>7.31</u>
DEPTH TO WATER (feet):	<u>12.60</u>	CALCULATED PURGE (gal.):	<u>21.95</u>
DEPTH OF WELL (feet):	<u>23.8</u>	ACTUAL PURGE VOL. (gal.):	<u>22.0</u>

DATE PURGED: ~~8-28-93~~ 8-23-93 Start (2400 Hr) 1036 End (2400 Hr) 1047  
 DATE SAMPLED: ~~8-28-93~~ 8-23-93 Start (2400 Hr) 1054 End (2400 Hr) \_\_\_\_\_

TIME (2400 Hr)	VOLUME (gal.)	pH (unit:)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1040</u>	<u>7.5</u>	<u>7.32</u>	<u>748</u>	<u>69.9</u>	<u>LI-BRN</u>	<u>HEAVY</u>
<u>1043</u>	<u>15.0</u>	<u>6.95</u>	<u>722</u>	<u>68.8</u>	<u>"</u>	<u>"</u>
<u>1047</u>	<u>22.0</u>	<u>6.94</u>	<u>715</u>	<u>68.2</u>	<u>"</u>	<u>"</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: NONE COLOR: NR TURBIDITY: NR  
(COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

<input type="checkbox"/> 2" Bladder Pump	<input type="checkbox"/> Bailer (Teflon Ⓢ)	<input type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailer (Teflon Ⓢ)
<input type="checkbox"/> Centrifugal Pump	<input checked="" type="checkbox"/> Bailer (PVC)	<input type="checkbox"/> DDL Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated
Other: _____		Other: _____	

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: all samples taken

Meter Calibration: Date: 8-23-93 Time: 1030 Meter Serial #: 4972 Temperature °F: 76.1  
 (EC 1000 1015/1000) (DI \_\_\_\_\_) (pH 7 706/700) (pH 10 1000/1000) (pH 4 401/)

Location of previous calibration: \_\_\_\_\_

Signature: M. Gallegos Reviewed By: [Signature] Page 4 of 7



EMCON  
ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 0670-05401

SAMPLE ID: MW-5

PURGED BY: M. Callegos

CLIENT NAME: ARCOH 2185

SAMPLED BY: M. Callegos

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water \_\_\_\_\_ Treatment Effluent \_\_\_\_\_ Other \_\_\_\_\_

CASING DIAMETER (inches): 2 \_\_\_\_\_ 3 \_\_\_\_\_ 4  4.5 \_\_\_\_\_ 6 \_\_\_\_\_ Other \_\_\_\_\_

CASING ELEVATION (feet/MSL):	<u>NC</u>	VOLUME IN CASING (gal.):	<u>9.97</u>
DEPTH TO WATER (feet):	<u>11.43</u>	CALCULATED PURGE (gal.):	<u>29.92</u>
DEPTH OF WELL (feet):	<u>26.7</u>	ACTUAL PURGE VOL. (gal.):	<u>30.0</u>

DATE PURGED: 8-24-93 8:33-43 Start (2400 Hr) 1236 End (2400 Hr) 1250  
 DATE SAMPLED: 8-24-93 8:33-43 Start (2400 Hr) 1258 End (2400 Hr) -

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1239</u>	<u>10.0</u>	<u>7.16</u>	<u>510</u>	<u>68.8</u>	<u>BRN</u>	<u>HEAVY</u>
<u>1245</u>	<u>20.0</u>	<u>6.97</u>	<u>522</u>	<u>67.4</u>	<u>"</u>	<u>"</u>
<u>1250</u>	<u>30.0</u>	<u>6.89</u>	<u>532</u>	<u>67.1</u>	<u>"</u>	<u>"</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: NONE NR NR  
(COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
<input type="checkbox"/> 2' Bladder Pump	<input type="checkbox"/> Bailer (Teflon®)	<input type="checkbox"/> 2' Bladder Pump	<input checked="" type="checkbox"/> Bailer (Teflon®)
<input type="checkbox"/> Centrifugal Pump	<input checked="" type="checkbox"/> Bailer (PVC)	<input type="checkbox"/> ODL Sampler	<input type="checkbox"/> Bailer (Stainless Steel)
<input type="checkbox"/> Submersible Pump	<input type="checkbox"/> Bailer (Stainless Steel)	<input type="checkbox"/> Dipper	<input type="checkbox"/> Submersible Pump
<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated	<input type="checkbox"/> Well Wizard™	<input type="checkbox"/> Dedicated
Other: _____		Other: _____	

WELL INTEGRITY: GOOD LOCK #: 3259

REMARKS: all samples taken

Meter Calibration: Date: 8-23-93 Time: \_\_\_\_\_ Meter Serial #: 4972 Temperature °F: \_\_\_\_\_  
( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: MW-4

Signature: M. Callegos Reviewed By: js Page 5 of 7



EMCON ASSOCIATES

# WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/91

PROJECT NO: 0670-054.01

SAMPLE ID: MW-6

PURGED BY: M. Gallegos

CLIENT NAME: ARID #2185

SAMPLED BY: M. Gallegos

LOCATION: OAKLAND, CA.

TYPE: Ground Water  Surface Water  Treatment Effluent  Other

CASING DIAMETER (inches): 2  3  4  4.5  6  Other

CASING ELEVATION (feet/MSL):	<u>NR</u>	VOLUME IN CASING (gal.):	<u>10.72</u>
DEPTH TO WATER (feet):	<u>11.28</u>	CALCULATED PURGE (gal.):	<u>32.18</u>
DEPTH OF WELL (feet):	<u>27.7</u>	ACTUAL PURGE VOL. (gal.):	<u>32.5</u>

DATE PURGED: 8-24-93 9:23 AM Start (2400 Hr) 1153 End (2400 Hr) 1206

DATE SAMPLED: 8-24-93 9:23 AM Start (2400 Hr) 1215 End (2400 Hr) -

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1157</u>	<u>11.0</u>	<u>6.70</u>	<u>741</u>	<u>68.8</u>	<u>grey</u>	<u>heavy</u>
<u>1202</u>	<u>22.0</u>	<u>6.68</u>	<u>751</u>	<u>68.5</u>	<u>"</u>	<u>"</u>
<u>1206</u>	<u>32.5</u>	<u>6.71</u>	<u>750</u>	<u>68.5</u>	<u>"</u>	<u>"</u>

D. O. (ppm): NR ODOR: slight COLOR: NR TURBIDITY: NR  
(COBALT 0 - 100) (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |   |   |  |   |
|---|---|--|---|
| <input type="checkbox"/> 2' Bladder Pump  | <input type="checkbox"/> Bailer (Teflon Ⓢ)        | <input type="checkbox"/> 2' Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon Ⓢ) |
| <input type="checkbox"/> Centrifugal Pump | <input checked="" type="checkbox"/> Bailer (PVC)  | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailer (Stainless Steel)     |
| <input type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump             |
| <input type="checkbox"/> Well Wizard™     | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                    |
| Other: _____                              |   | Other: _____                             |   |

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: all samples taken

Meter Calibration: Date: 8-23-93 Time: \_\_\_\_\_ Meter Serial #: 4972 Temperature °F: \_\_\_\_\_

( EC 1000 \_\_\_\_\_ / \_\_\_\_\_ ) ( DI \_\_\_\_\_ ) ( pH 7 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 10 \_\_\_\_\_ / \_\_\_\_\_ ) ( pH 4 \_\_\_\_\_ / \_\_\_\_\_ )

Location of previous calibration: MW-4

Signature: M. Gallegos Reviewed By: JBS Page 6 of 7



# WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 06 702 054 01

SAMPLE ID: MW-7

PURGED BY: M. Gallegos

CLIENT NAME: ARCO # 2185

SAMPLED BY: M. Gallegos

LOCATION: OAKLAND, CA

TYPE: Ground Water  Surface Water  Treatment Effluent  Other

CASING DIAMETER (inches): 2  3  4  4.5  6  Other

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.17  
 DEPTH TO WATER (feet): 12.0 CALCULATED PURGE (gal.): 6.51  
 DEPTH OF WELL (feet): 25.3 ACTUAL PURGE VOL. (gal.): 7.0

DATE PURGED: ~~8-24-93~~ 8-23-93 Start (2400 Hr) 1458 End (2400 Hr) 1507

DATE SAMPLED: ~~8-24-93~~ 8-23-93 Start (2400 Hr) 1514 End (2400 Hr) \_\_\_\_\_

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1502</u>	<u>2.5</u>	<u>6.71</u>	<u>844</u>	<u>69.0</u>	<u>BRN</u>	<u>Heavy</u>
<u>1504</u>	<u>5.0</u>	<u>6.67</u>	<u>841</u>	<u>68.1</u>	<u>"</u>	<u>"</u>
<u>1507</u>	<u>7.0</u>	<u>6.69</u>	<u>840</u>	<u>67.7</u>	<u>"</u>	<u>"</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: NONE (COBALT 0 - 100) NR (NTU 0 - 200) NR

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NR

### PURGING EQUIPMENT

### SAMPLING EQUIPMENT

- |   |   |  |  |
|---|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump  | <input type="checkbox"/> Bailer (Teflon®)         | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input checked="" type="checkbox"/> Bailer (PVC)  | <input type="checkbox"/> DDL Sampler     | <input type="checkbox"/> Bailer (Stainless Steel)    |
| <input type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper          | <input type="checkbox"/> Submersible Pump            |
| <input type="checkbox"/> Well Wizard™     | <input type="checkbox"/> Dedicated                | <input type="checkbox"/> Well Wizard™    | <input type="checkbox"/> Dedicated                   |
| Other: _____                              |   | Other: _____                             |  |

WELL INTEGRITY: Good LOCK #: 3259 <sup>As pH in</sup>

REMARKS: all sample taken

Meter Calibration: Date: 8-23-93 Time: 1450 Meter Serial #: 4972 Temperature °F: 83.0  
( EC 1000 791 / 1000 ) ( DI \_\_\_\_\_ ) ( pH 7 701 / 700 ) ( pH 10 987 / 1000 ) ( pH 4 400 / 400 )

Location of previous calibration: \_\_\_\_\_

Signature: [Signature] Reviewed By: [Signature] Page 7 of 7



# EMCON Associates

1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

Date September 9, 1993  
Project OG70-054.01

To:  
Mr. John Young  
RESNA  
3315 Almaden Expressway, Suite 34  
San Jose, California 95118

We are enclosing:

Copies	Description
<u>1</u>	<u>Depth To Water / Floating Product Survey Results</u>
<u>1</u>	<u>Summary of Groundwater Monitoring Data</u>
<u>1</u>	<u>Certified Analytical Reports with Chain-of-Custody</u>
<u>6</u>	<u>Water Sample Field Data Sheets</u>

For your:  X  Information Sent by:  X  Mail

Comments:

Enclosed are the data from the third quarter 1993 monitoring event at ARCO service station 2185, 9800 East 14th Street, Oakland, California. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Reviewed by:



Jim Butera JB

Robert Porter  
Robert Porter, Senior Project Engineer.



**FIELD REPORT  
DEPTH TO WATER / FLOATING PRODUCT SURVEY**

PROJECT # : OG70-054.01

STATION ADDRESS : 9800 East 14th Street, Oakland

DATE : 9-28-93

ARCO STATION # : 2185

FIELD TECHNICIAN : IAN GRAHAM

DAY : TUESDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-1	OK	15/16	OK	3259	BAD	12.60	12.60	ND	NR	23.4	NEEDS NEW CAP DIDNT HAVE ONE
2	MW-4	OK	15/16	OK	3259	BAD	12.88	12.88	ND	NR	23.8	NEEDS NEW CAP DIDNT HAVE ONE
3	MW-5	OK	15/16	OK	3259	OK	11.66	11.66	ND	NR	24.7	—
4	MW-2	OK	15/16	OK	3259	OK	12.17	12.17	ND	NR	23.6	—
5	MW-6	OK	15/16	OK	3259	OK	11.50	11.50	ND	NR	27.7	—
6	MW-3	OK	15/16	OK	3259	OK	12.13	12.13	ND	NR	23.3	—
7	MW-7	OK	15/16	OK	DOLPHIN	OK	12.17	12.17	ND	NR	25.3	ON SIDEWALK

**SURVEY POINTS ARE TOP OF WELL CASINGS**