

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Third Quarter 1993
at
ARCO Station 2185
9800 East 14th Street
Oakland, California

62026.04

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

November 2, 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

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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


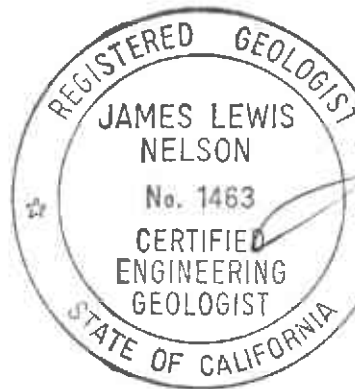
November 2, 1993
62026.04

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

Sincerely,
RESNA Industries Inc.



Erin D. Krueger
Staff Geologist



James L. Nelson
Certified Engineering
Geologist No. 1463

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.

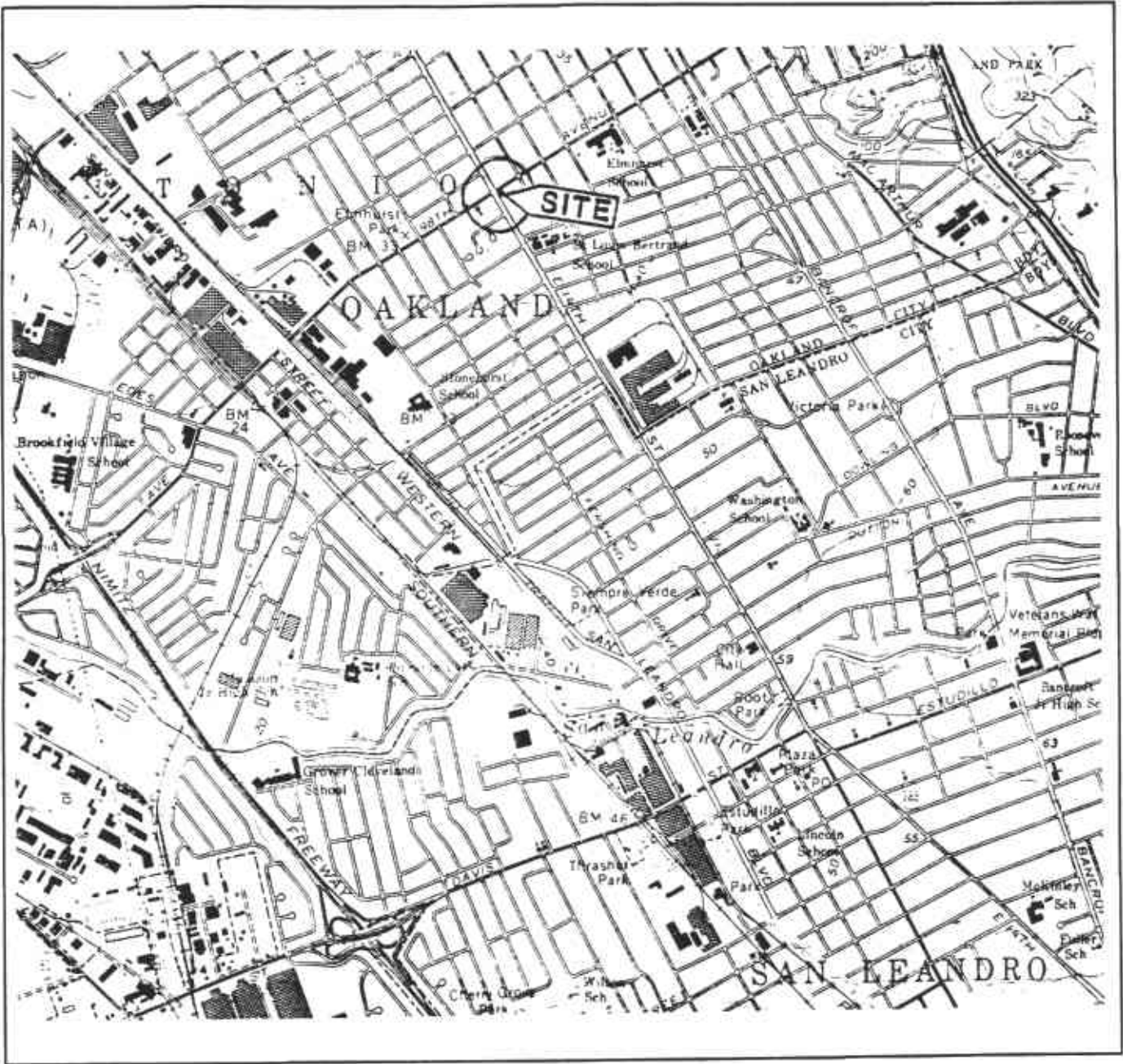
Appendix A: EMCON's Field Reports, EMCON's Water Sample Field Data
Sheets, and Certified Analytical Reports with Chain of Custody
Record

Quarterly Groundwater Monitoring
ARCO Station 2185, Oakland, California

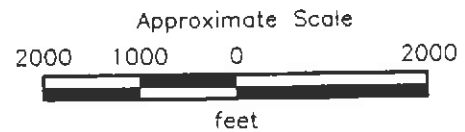
November 2, 1993
62026.04

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

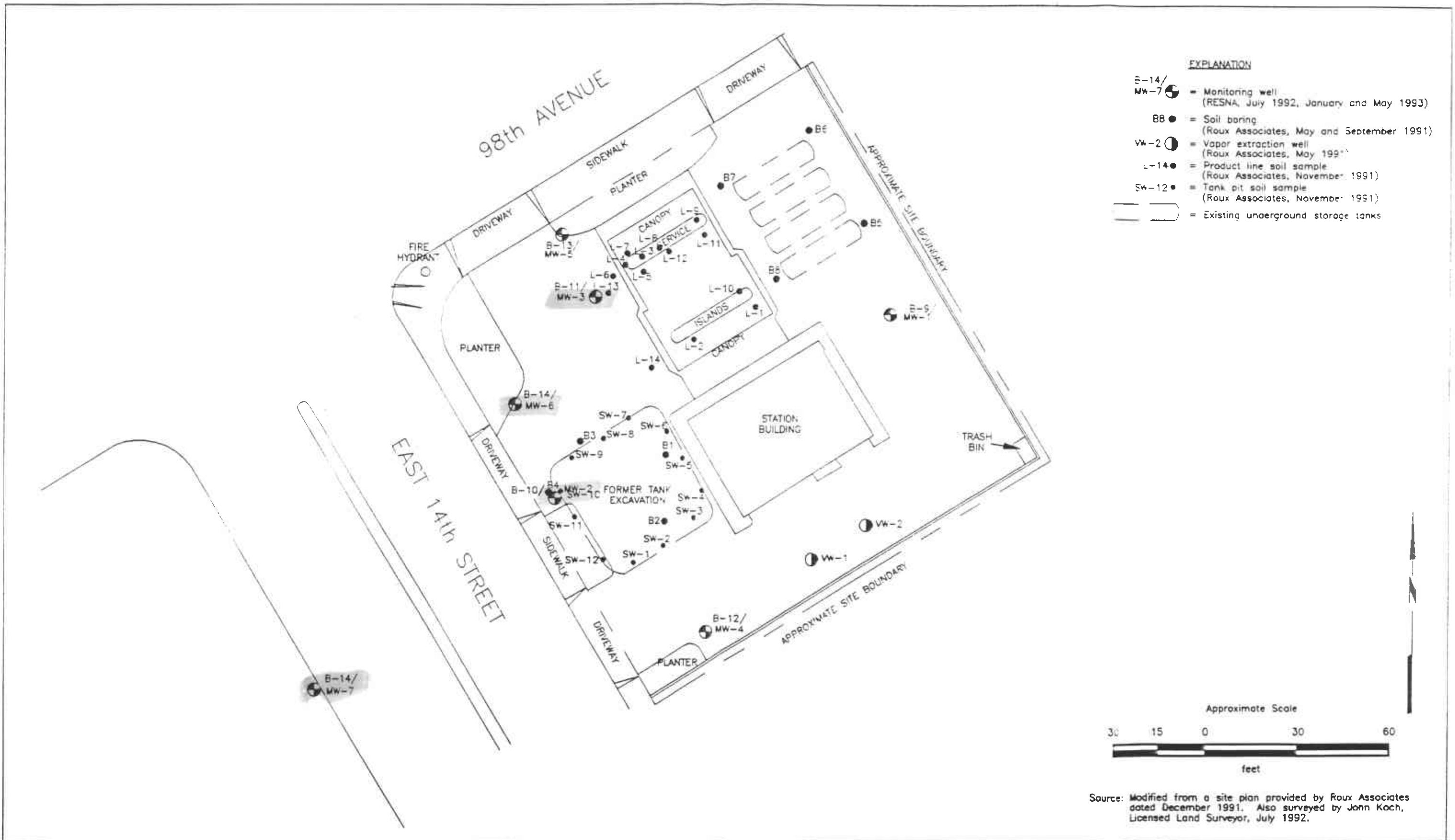


RESNA
 Working to Restore Nature

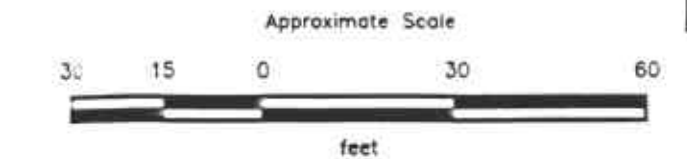
SITE VICINITY MAP
 ARCO Station 2185
 9800 East 14th Street
 San Leandro, California

PLATE
 1

PROJECT 62026.04

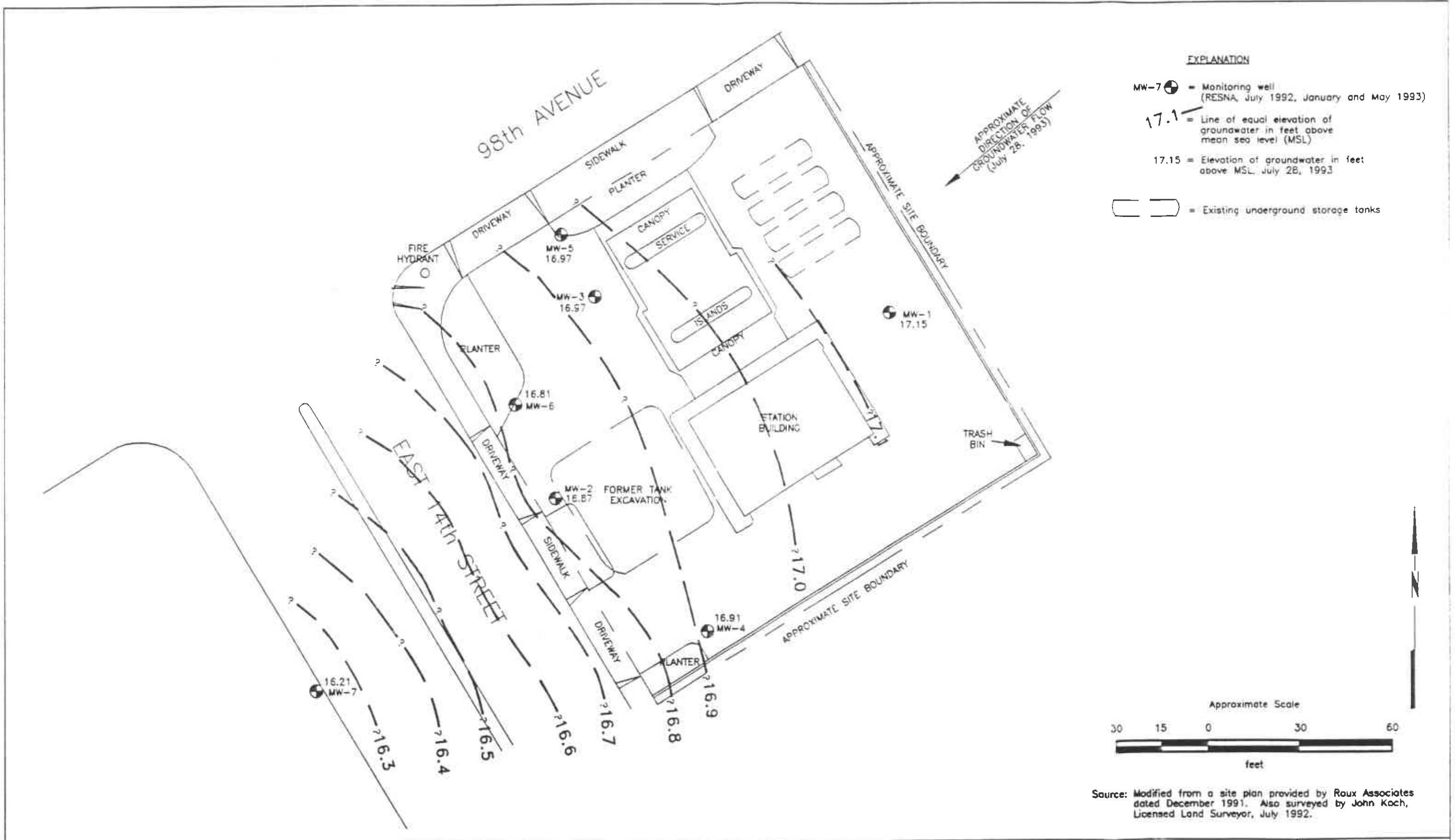


- EXPLANATION**
- B-14/
MW-7 = Monitoring well
(RESNA, July 1992, January and May 1993)
 - B6 = Soil boring
(Roux Associates, May and September 1991)
 - VW-2 = Vapor extraction well
(Roux Associates, May 1991)
 - L-14 = Product line soil sample
(Roux Associates, November 1991)
 - SW-12 = Tank pit soil 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.

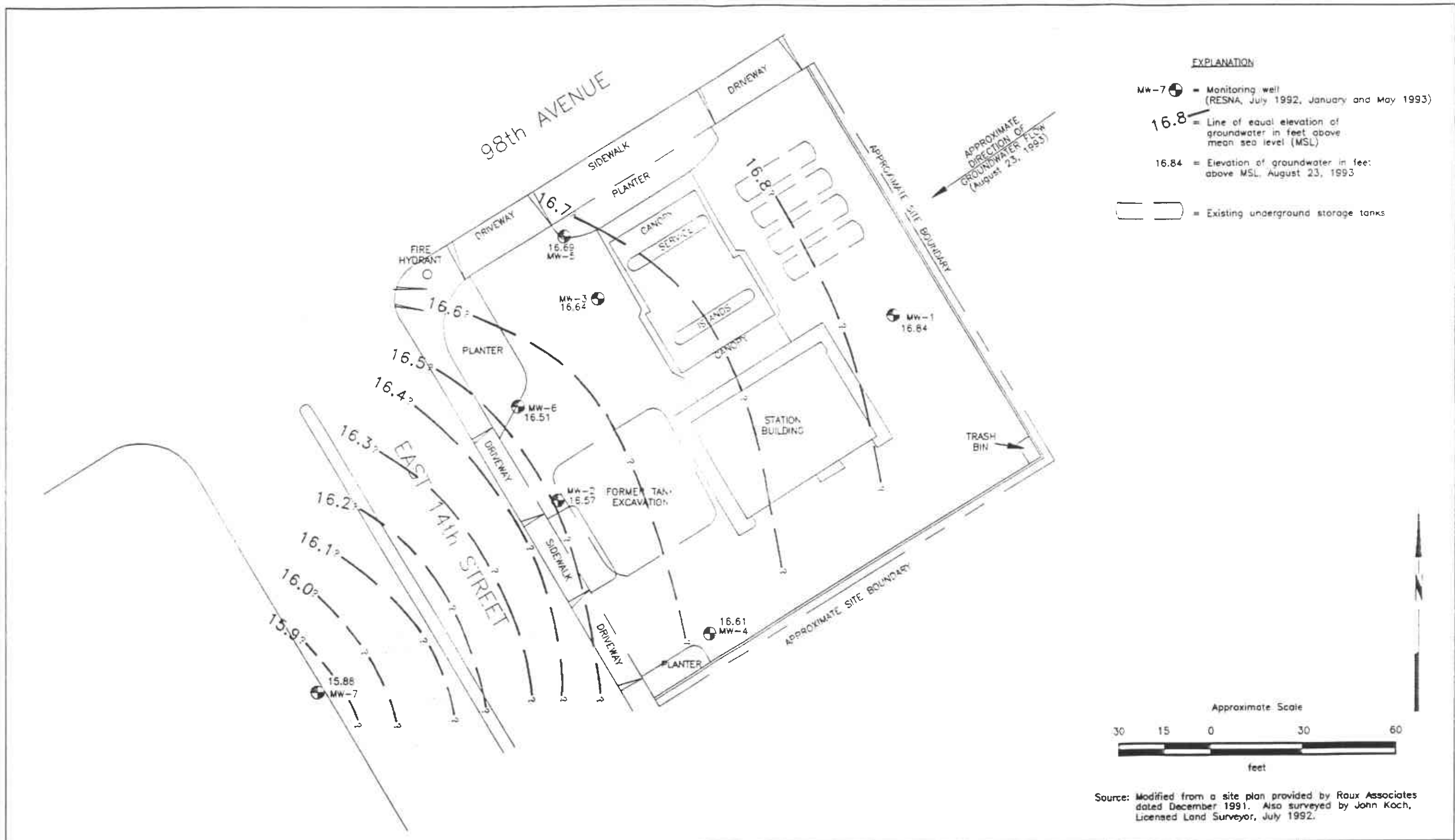




GROUNDWATER GRADIENT MAP
ARCO Station 2185
9800 East 14th Street
Oakland, California

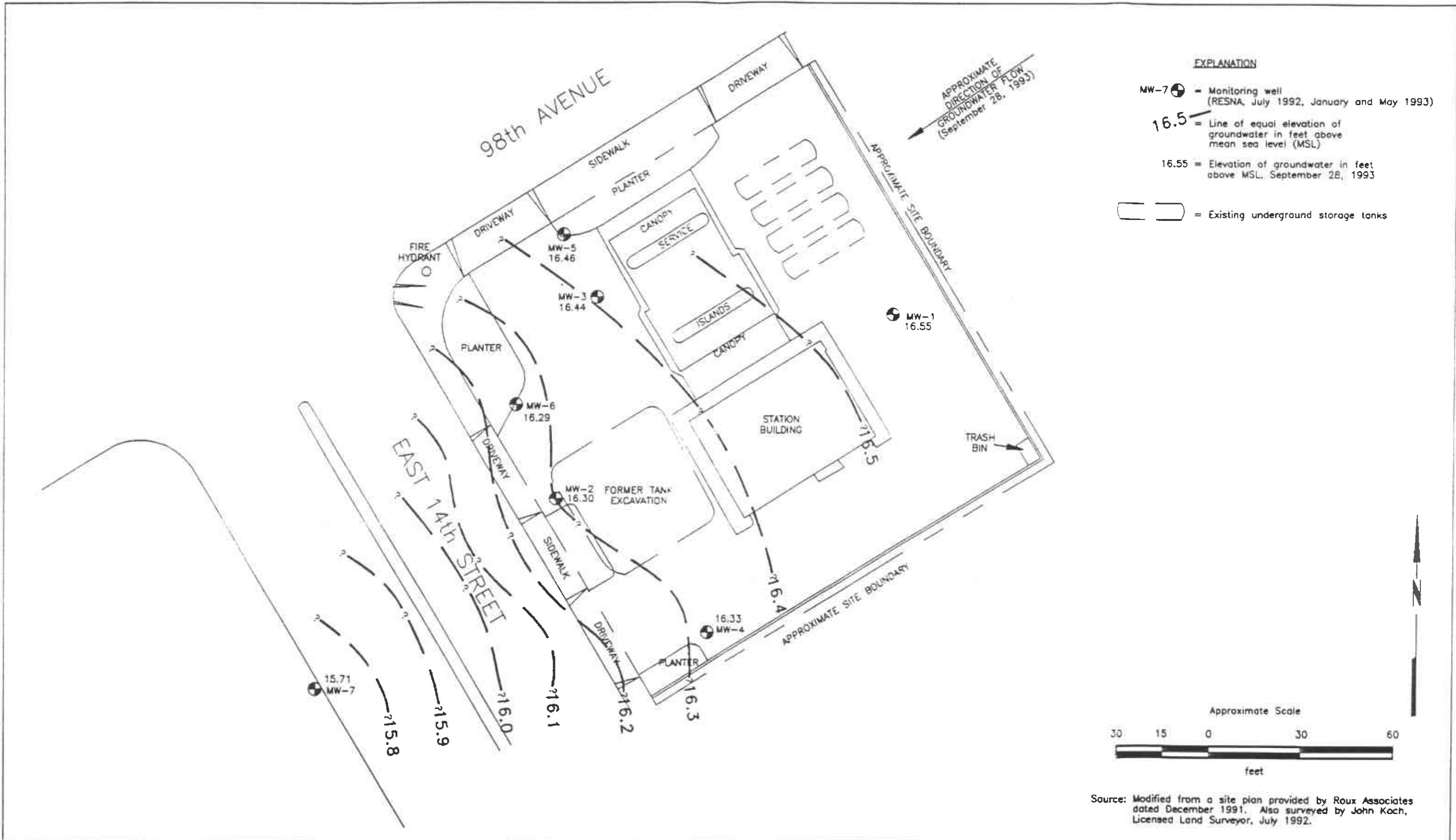
PLATE

3



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

PLATE
 4



PROJECT 62026.04 62026403

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

PLATE

5

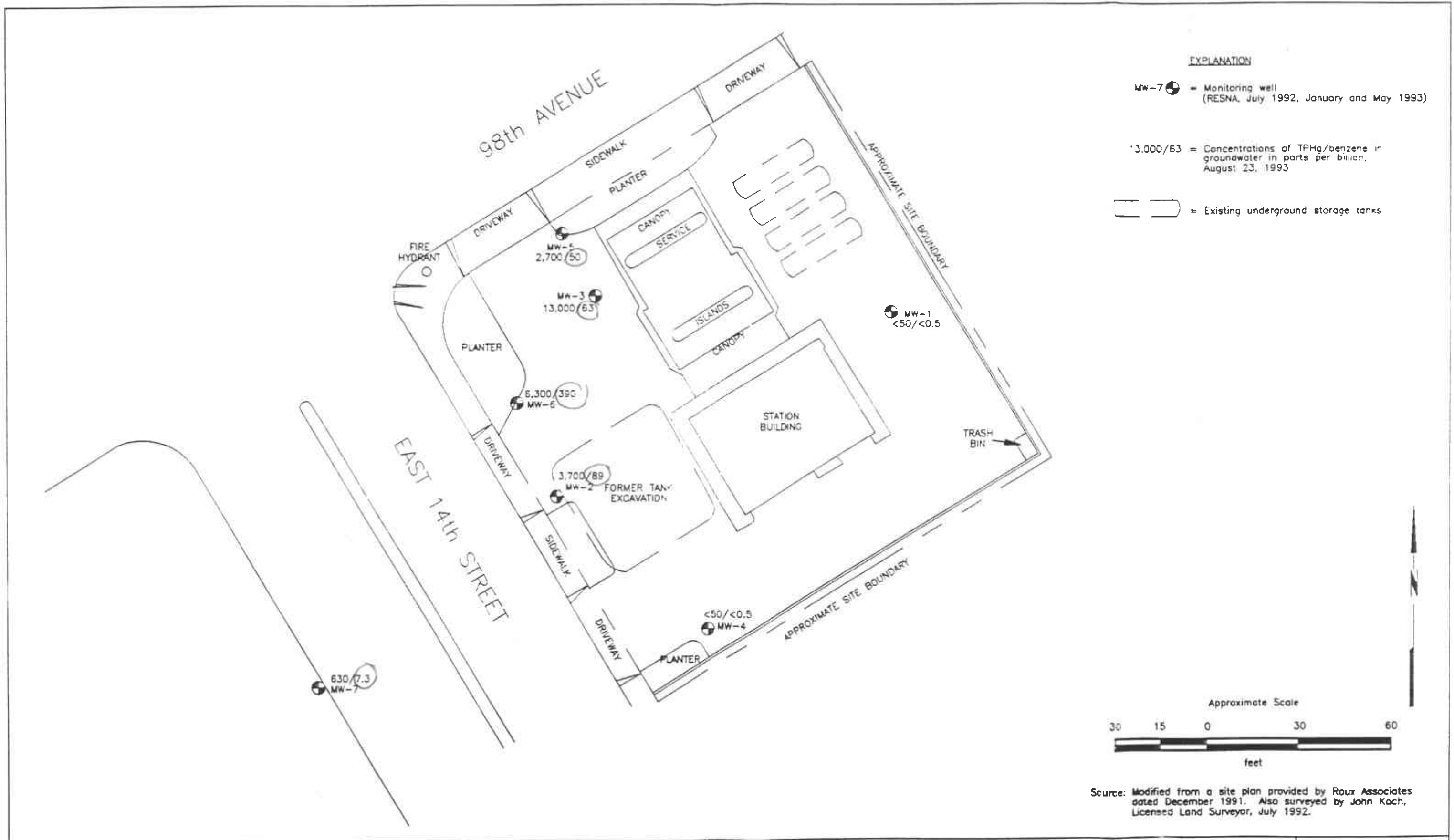


TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2185
Oakland, California
(Page 1 of 3)

Date Well Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1				
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
MW-2				
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
MW-3				
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

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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
<u>MW-3 cont.</u>				
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
<u>MW-4</u>				
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
<u>MW-5</u>				
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

November 2, 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
MW-1					
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
MW-2					
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
MW-3					
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
MW-4					
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
MW-5					
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
MW-6					
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
MW-7					
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	--	--

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

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).
-

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:

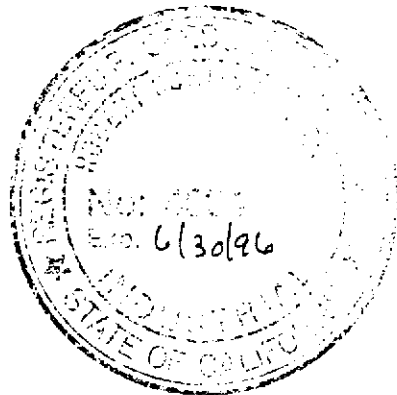
Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Results</u>
	<u>July 1993 monthly water level survey, ARCO</u>
	<u>station 2185, 9800 East 14th Street, Oakland, CA</u>

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	23.8	—
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 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>September 1993 monthly water level survey, ARCO</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 : 8-~~29~~²³

ARCO STATION # : 2185

FIELD TECHNICIAN : M. Callegas

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	3259	good	12.00	12.00	ND	NR	25.3	---

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 ¹ as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)
MW-1(23)	08/23/93	12.31	ND. ²	<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^{INC.}**

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:

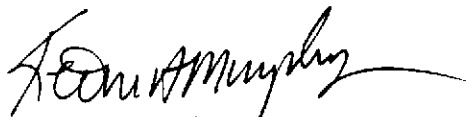
Attached are the results of the water samples submitted to our lab on August 24, 1993. For your reference, these analyses have been assigned our service request number SJ93-1046.

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.

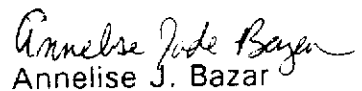
Please call if you have any questions.

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. 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
 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: K. Ann Murphy Date: September 8, 1993

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
 $\mu\text{g/L}$ (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 Amundson* 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

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:

Kenneth Murphy

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

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

<u>Analyte</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>Spike Result</u>		<u>MS</u> <u>DMS</u>		<u>CAS Acceptance Criteria</u>
			<u>MS</u>	<u>DMS</u>	<u>MS</u>	<u>DMS</u>	
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:

Kevin Murphy

Date:

September 8, 1993

ARCO Products Company

Division of AtlanticRichfieldCompany

Task Order No. **EMC-93-5**

Chain of Custody

ARCO Facility no **2185** City (Facility) **OAKLAND** Project manager (Consultant) **JIM BUTERA**
 ARCO engineer **Kyle Christie** Telephone no. (ARCO) **4531-2434** 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**

Sample ID	Lab no	Container no	Matrix			Preservation		Sampling date	Sampling time	BTEX 602 EPA 8020	BTEX TPH EPA 1632 8020 8015	TPH Vol/lec 8015 Gas <input checked="" type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 4131 4132	TPH EPA 418 11SM803E	EPA 601 8010	EPA 624 8240	EPA 625 8270	TC, P Metals <input type="checkbox"/> VOA <input type="checkbox"/> Sem <input type="checkbox"/>	CAM Metals EPA 601-7000 Pb <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org. DHS Lead EPA 7420-7421	
			Soil	Water	Other	Ice	Acid														
MW 1 (23) 1-7		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 (26) 9-10		2							1258												
MW 6 (27) 11-12		2							1215												
MW 7 (25) 13-14		2							1514												

Method of shipment **sample will deliver**

Special detection Limit/reporting **Lowest Possible**

Special QA/QC **As Normal**

Remarks **2-40ml Hcl VOA's**

Lab number **5593-1046**

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

Condition of sample **OILY**
 Relinquished by sampler **[Signature]** Date **8-24-93** Time **08:45**
 Relinquished by _____ Date _____ Time _____
 Relinquished by _____ Date _____ Time _____

Temperature received **Cool**
 Received by _____
 Received by _____
 Received by laboratory **[Signature]** Date **8-24-93** Time **0845**



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: ARCUF#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>7.37</u>
DEPTH TO WATER (feet):	<u>12.31</u>	CALCULATED PURGE (gal.):	<u>22.12</u>
DEPTH OF WELL (feet):	<u>23.10</u>	ACTUAL PURGE VOL. (gal.):	<u>22.5</u>

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>BRN</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 (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: _____	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 8:33-43 Start (2400 Hr) 1110 End (2400 Hr) 1120
 DATE SAMPLED: 8-24-93 8:33-43 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®) | <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: _____ | Other: _____ | Other: _____ |

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: all samples taken
Screen on top of purge water
detected

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: JG Page 2 of ?



WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/91

PROJECT NO: 0670-054-01

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

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>heavy</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 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 3 of 7



WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 0670-05401
PURGED BY: M. Gallegos
SAMPLED BY: M. Gallegos

SAMPLE ID: MW-4
CLIENT NAME: ARCO # 2185
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.): 7.31
DEPTH TO WATER (feet): 12.60 CALCULATED PURGE (gal.): 21.95
DEPTH OF WELL (feet): 23.8 ACTUAL PURGE VOL. (gal.): 22.0

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>4-BRN</u>	<u>HEAVY</u>
<u>1043</u>	<u>150</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 (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

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 1009/1000) (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. Callegas

CLIENT NAME: ARONH 2185

SAMPLED BY: M. Callegas

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~~ 8-23-93 Start (2400 Hr) 1236 End (2400 Hr) 1250
 DATE SAMPLED: ~~8-24-93~~ 8-23-93 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"/> 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: [Signature] Reviewed By: [Signature] Page 5 of 7



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/91

PROJECT NO: 0670-05401

SAMPLE ID: MW-6

PURGED BY: M. Callegos

CLIENT NAME: ARCO #2185

SAMPLED BY: M. Callegos

LOCATION: AKLAND, CA.

TYPE: Ground Water Surface Water _____ Treatment Effluent _____ Other _____

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

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

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

DATE SAMPLED: ~~8-24-93~~ 8-23-93 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 _____
(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: _____

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: JB Page 6 of 7



WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/91

PROJECT NO: 06 70-054 01
PURGED BY: M. Callegos
SAMPLED BY: M. Callegos

SAMPLE ID: MW-7
CLIENT NAME: ARCO # 2185
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>11</u>	<u>11</u>
<u>1507</u>	<u>7.0</u>	<u>6.69</u>	<u>840</u>	<u>67.7</u>	<u>11</u>	<u>11</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

D. O. (ppm): NR ODOR: NONE NR (COBALT 0 - 100) NR (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 B)	<input type="checkbox"/> 2" Bladder Pump	<input checked="" type="checkbox"/> Bailor (Teflon B)
<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 ^{1301PH in.}

REMARKS: 9/1 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: Manuel Callegos Reviewed By: JAS 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.

Jim Butera JB

Reviewed by:



Robert C. 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