

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

**LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Fourth Quarter 1992
at
ARCO Station 2185
9800 East 14th Street
Oakland, California**

62026.03

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

March 15, 1993
0128MWHE
62026.03

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

Subject: Fourth Quarter 1992 Groundwater Monitoring Report for ARCO Station
2185 at 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 fourth quarter 1992 groundwater monitoring performed by EMCON Associates (EMCON) of San Jose, California, at the above-referenced site. The objectives of this quarterly groundwater monitoring are to evaluate changes in the groundwater flow direction and gradient, and changes in concentrations of petroleum hydrocarbons in the local groundwater associated with former underground gasoline-storage tanks (USTs) at the site. Field work and laboratory analyses this quarter was performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of gasoline product, collecting groundwater samples from the wells 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

March 15, 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 the reports listed in the references section of this report.

Groundwater Sampling and Gradient Evaluation

Depth to water measurements (DTW) and quarterly sampling were performed by EMCON field personnel on October 19, 1992, and DTW measurements were also performed on November 23, and December 16, 1992. 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 MW-1 through MW-4, are presented on EMCON's Field Report 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-4 for this quarter are summarized in Table 1, Groundwater Monitoring Data. EMCON's DTW measurements were used to evaluate groundwater elevations, gradients, and flow directions in October, November, and December 1992. 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 October, November, and December 1992, are shown on Groundwater Gradient Maps, Plates 3 through 5. The interpreted groundwater gradients and flow direction are approximately 0.002 toward the southwest. The groundwater gradient and flow direction evaluated for this quarter are generally consistent with the previous quarter.

Groundwater monitoring wells MW-1 through MW-4 were purged and sampled by EMCON field personnel on October 19, 1992. Water Sample Field Data Sheets are included in Appendix A. The purge water was removed from the site by a licensed hazardous waste hauler. The Monitoring Well Purge Water Transport Form is also included in Appendix A.

Laboratory Methods and Results

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

Quarterly Groundwater Monitoring
ARCO Station 2185, Oakland, California

March 15, 1993
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in Table 2, Results of Laboratory Analyses of Groundwater Samples--TPHg and BTEX. Concentrations of TPHg and benzene in the groundwater are shown on Plate 6, TPHg Concentrations in Groundwater, and Plate 7, Benzene Concentrations in Groundwater. The Chain of Custody Records and Laboratory Analysis Reports are included in Appendix A.

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


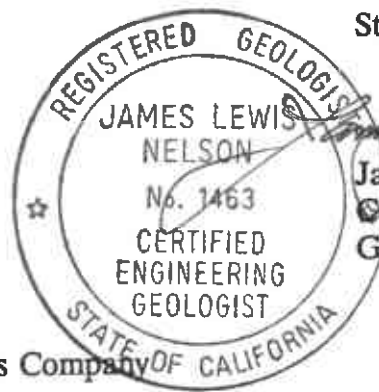
March 15, 1993
62026.03

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

Sincerely,
RESNA Industries Inc.



Erin McLucas
Staff Geologist



James L. Nelson
Certified Engineering
Geologist No. 1463

cc: H.C. Winsor, ARCO Products Company

Enclosures: References

- Plate 1, Site Vicinity Map
- Plate 2, Generalized Site Plan
- Plate 3, Groundwater Gradient Map, October 19, 1992
- Plate 4, Groundwater Gradient Map, November 23, 1992
- Plate 5, Groundwater Gradient Map, December 16, 1992
- Plate 6, TPHg Concentrations in Groundwater, October 19, 1992
- Plate 7, Benzene Concentrations in Groundwater, October 19, 1992

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

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

Quarterly Groundwater Monitoring
ARCO Station 2185, Oakland, California

March 15, 1993
62026.03

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
- 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



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

LEGEND

● = Site Location



Approximate Scale

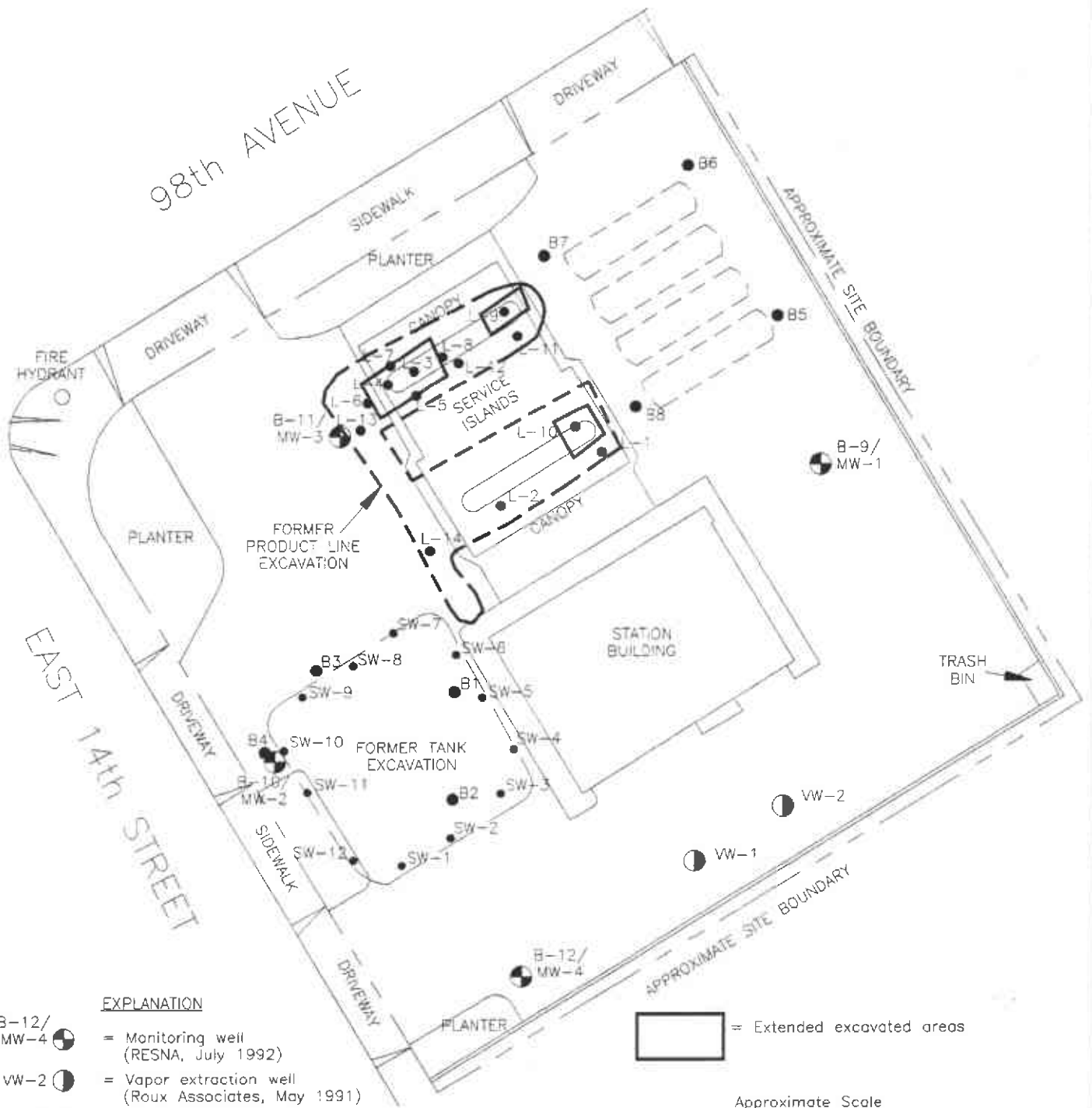


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 Working to Restore Nature

PROJECT 62026.03

**SITE VICINITY MAP
 ARCO Station 2185
 9800 East 14th Street
 Oakland, California**

**PLATE
 1**



EXPLANATION

- B-12/
MW-4 ● = Monitoring well
(RESNA, July 1992)
- VW-2 ● = Vapor extraction well
(Roux Associates, May 1991)
- B8 ● = Soil boring
(Roux Associates, May and September 1991)
- L-13 ● = Soil boring
(Roux Associates, November 1991)
- SW-12 ● = Tank cavity soil sample
(Roux Associates, November 1991)
- — — = Existing underground storage tanks

▭ = Extended excavated areas

Approximate Scale



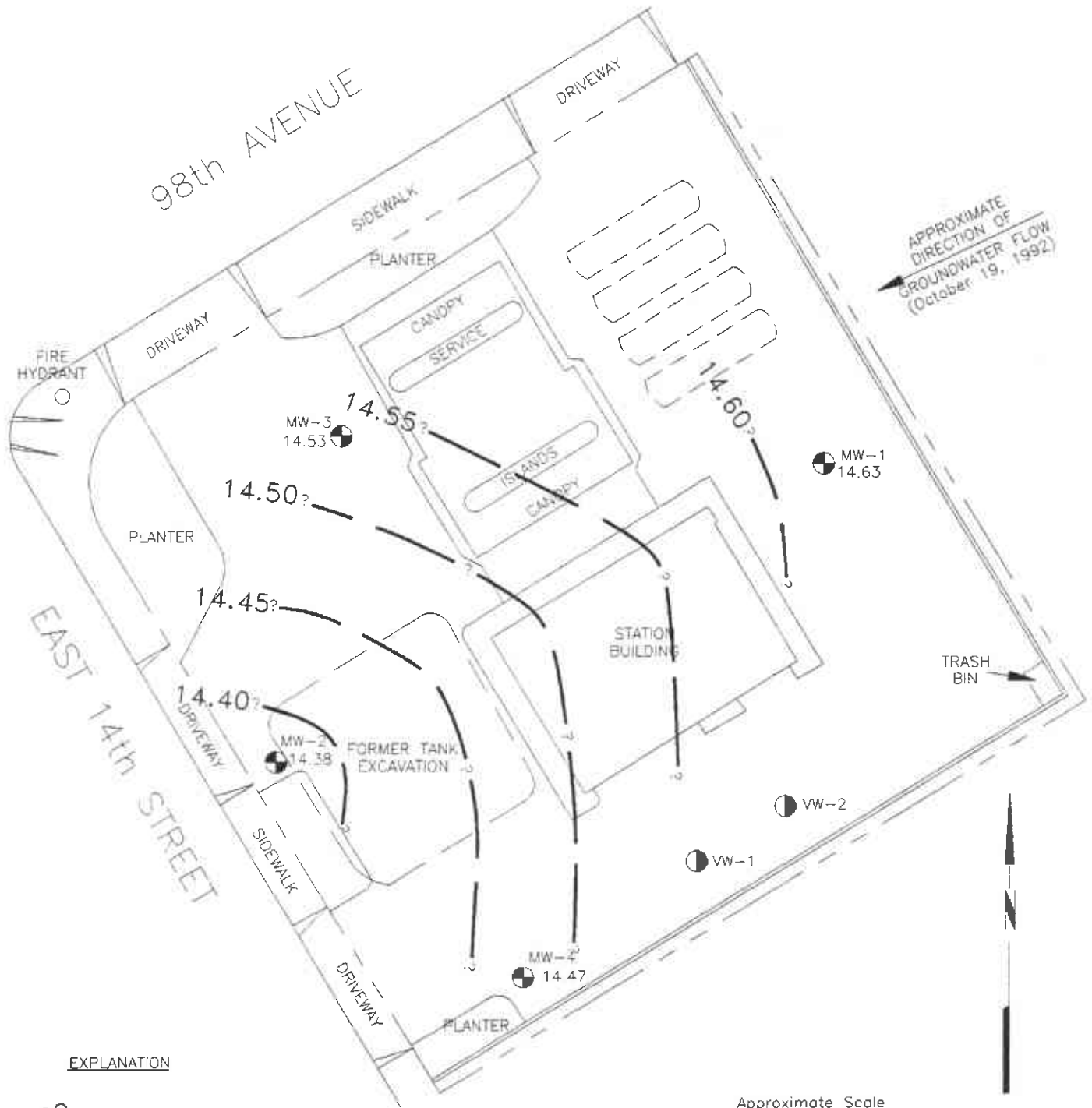
Source: Modified from a site plan provided by Roux Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.






GENERALIZED SITE PLAN
ARCO Station 2185
9800 East 14th Street
Oakland, California

PLATE
2

PROJECT 62026.03



EXPLANATION

- 14.60 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 14.63 = Elevation of groundwater in feet above MSL, October 19, 1992
- MW-4  = Monitoring well (RESNA, July 1992)
- VW-2  = Vapor extraction well (Roux Associates, May 1991)
-  = Existing underground storage tanks

Approximate Scale



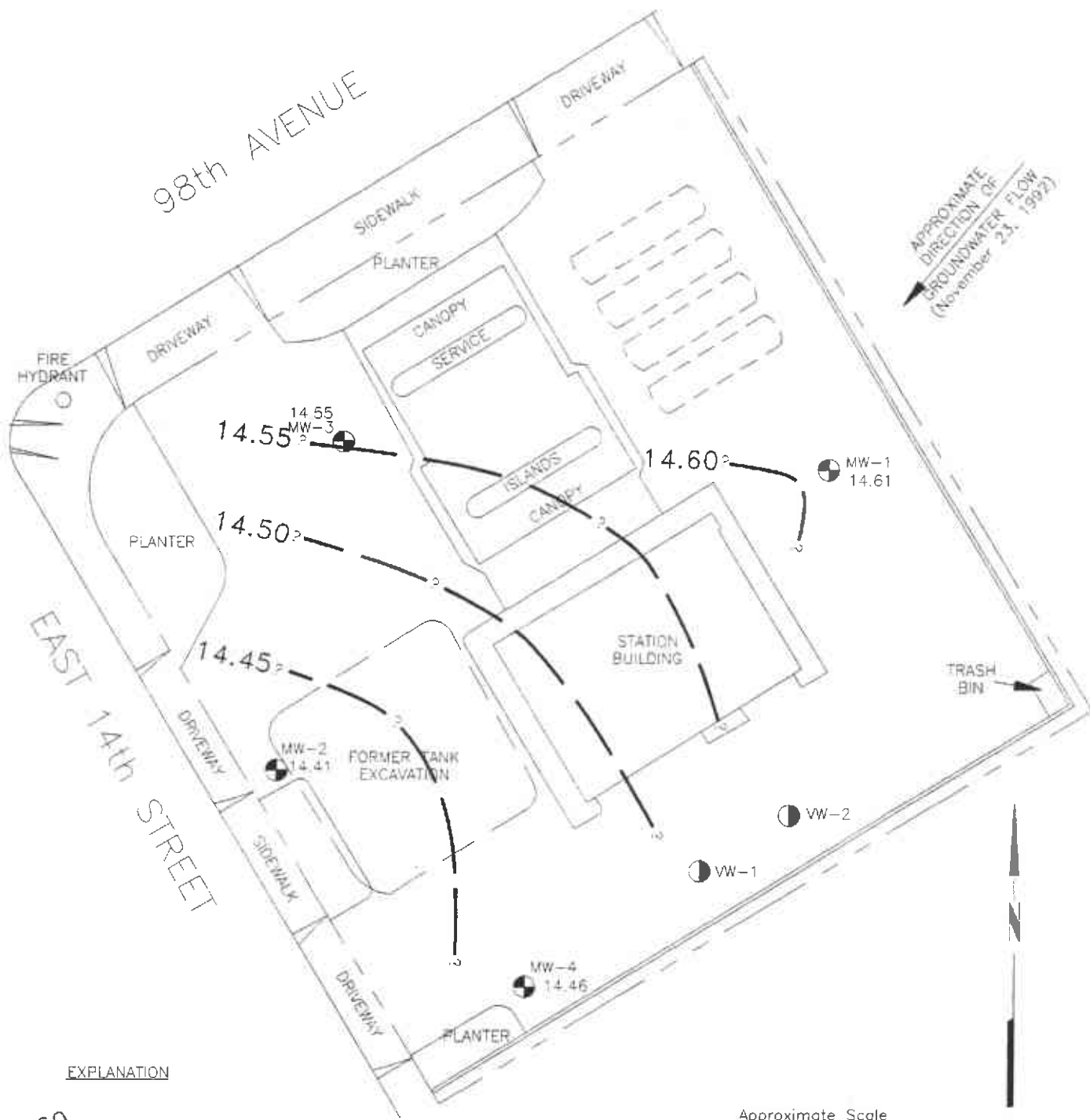
SOURCE: Modified from a site plan provided by ROUX Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.

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




PLATE
3

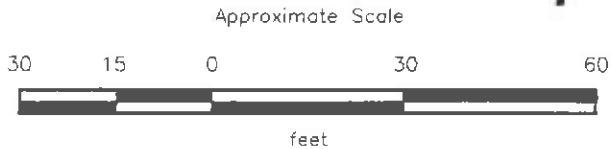
PROJECT 62026.03



APPROXIMATE
DIRECTION OF
GROUNDWATER FLOW
(November 23, 1992)

EXPLANATION

- 14.60 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 14.61 = Elevation of groundwater in feet above MSL, November 23, 1992
- MW-4  = Monitoring well (RESNA, July 1992)
- VW-2  = Vapor extraction well (Roux Associates, May 1991)
-  = Existing underground storage tanks



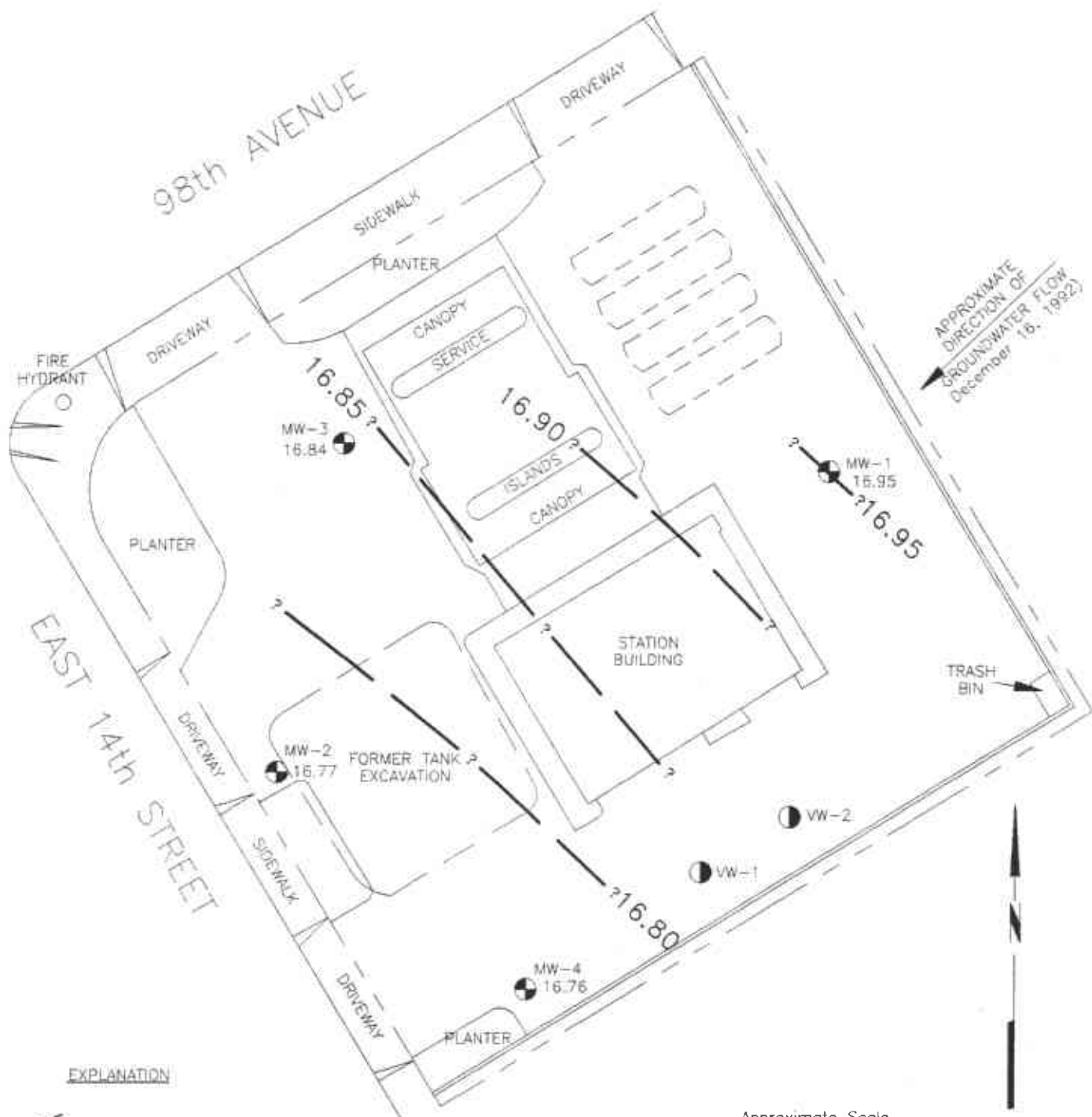
SOURCE: Modified from a site plan provided by ROUX Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.



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




PLATE
4

PROJECT 62026.03

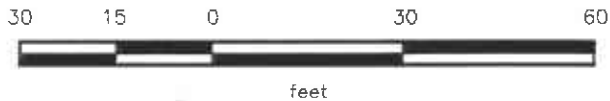


APPROXIMATE
DIRECTION OF
GROUNDWATER FLOW
December 16, 1992

EXPLANATION

- 16.95 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 16.95 = Elevation of groundwater in feet above MSL, December 16, 1992
- MW-4  = Monitoring well (RESNA, July 1992)
- VW-2  = Vapor extraction well (Roux Associates, May 1991)
-  = Existing underground storage tanks

Approximate Scale



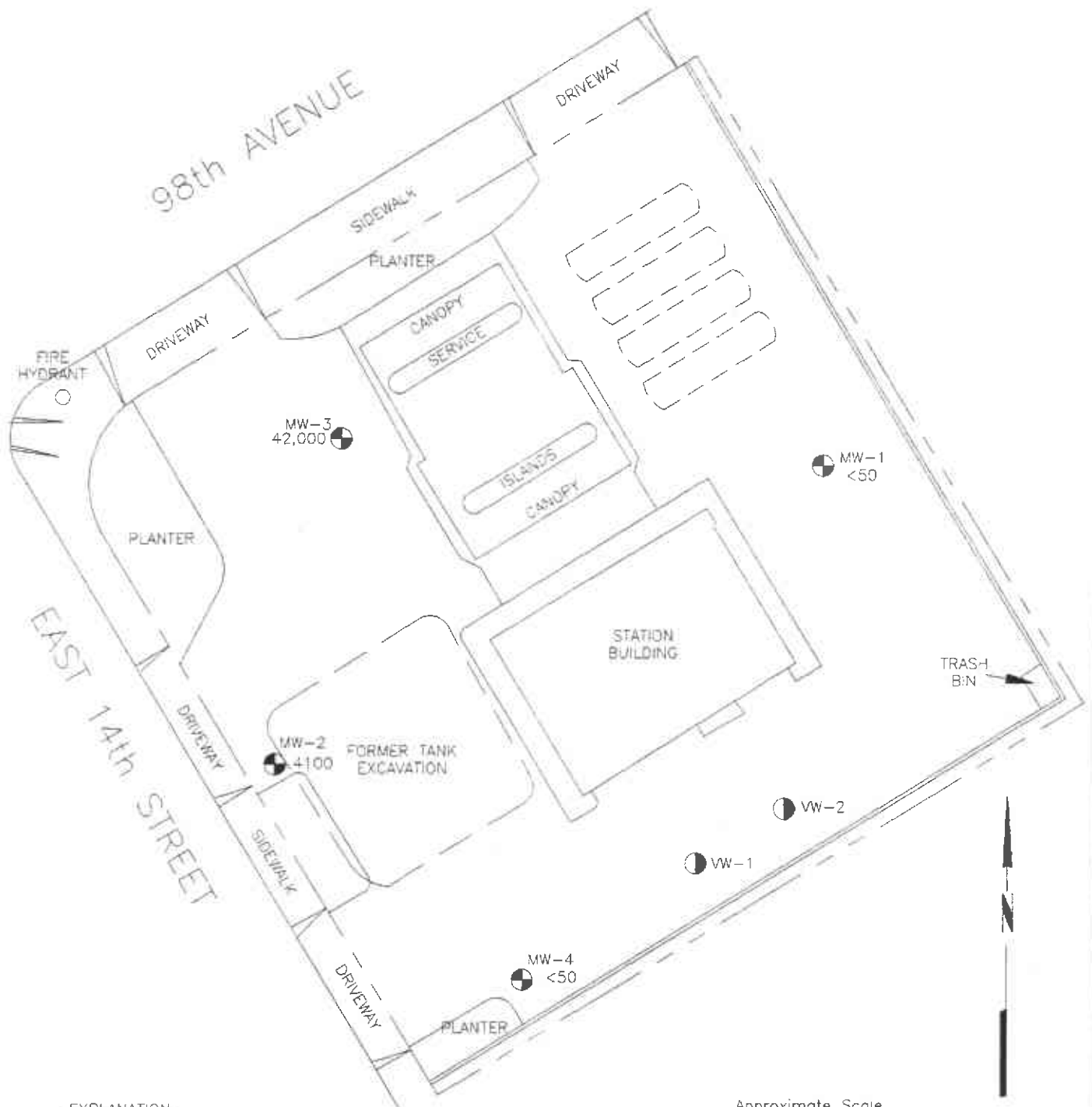
SOURCE: Modified from a site plan provided by ROUX Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.



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




PLATE
5

PROJECT 62026.03



EXPLANATION

42,000 = Concentration of TPHg in groundwater in parts per billion, October 19, 1992

- MW-4  = Monitoring well (RESNA, July 1992)
- VW-2  = Vapor extraction well (Roux Associates, May 1991)
-  = Existing underground storage tanks

Approximate Scale



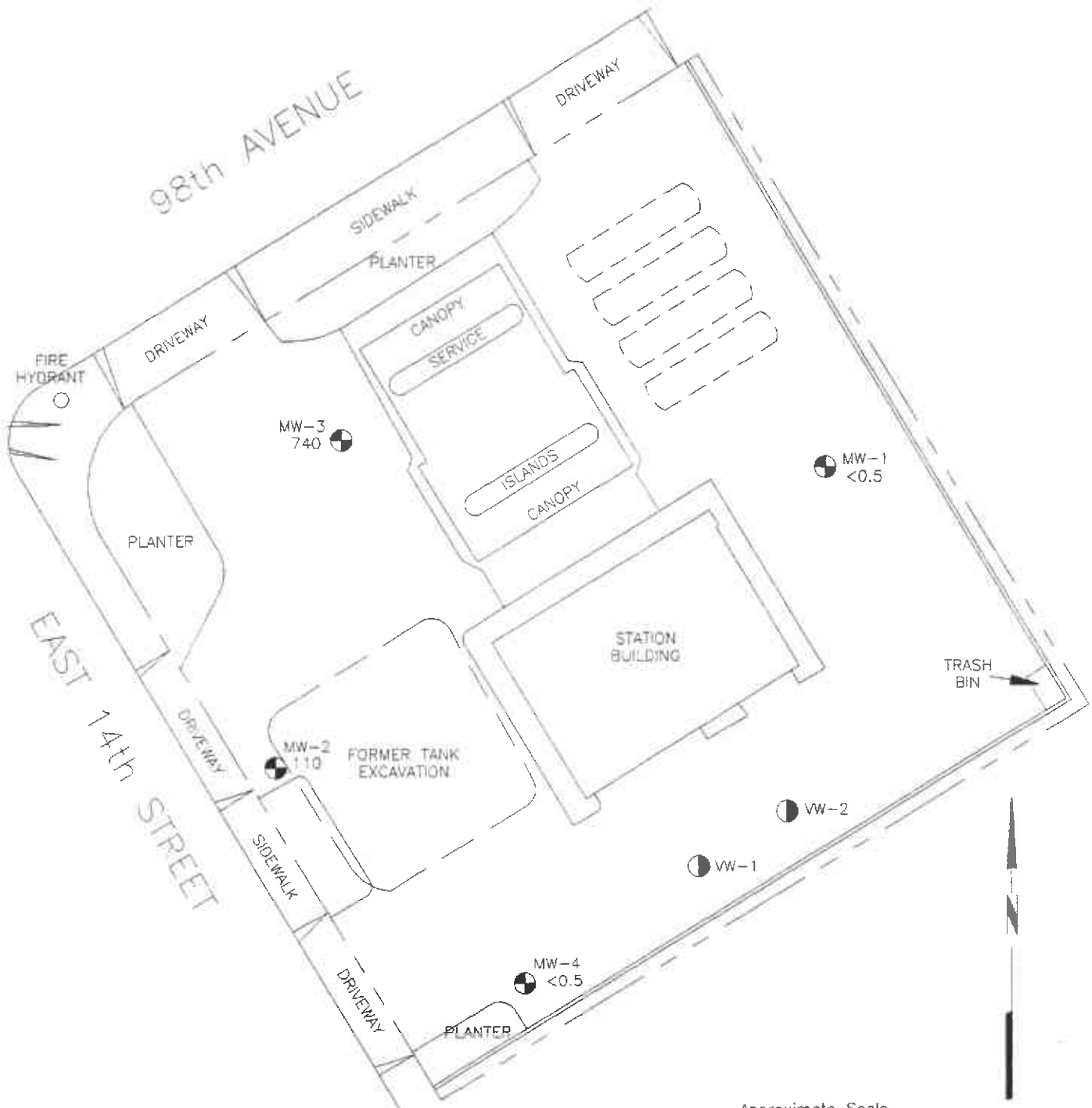
SOURCE: Modified from a site plan provided by ROUX Associates dated December 1991. Also surveyed by John Koch, Licensed Land Surveyor, July 1992.

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

**PLATE
6**



EXPLANATION

740 = Concentration of benzene in groundwater in parts per billion, October 19, 1992

- MW-4  = Monitoring well (RESNA, July 1992)
- VW-2  = Vapor extraction well (Roux Associates, May 1991)
-  = Existing underground storage tanks

Approximate Scale



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



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

**PLATE
7**

PROJECT 62026.03

Quarterly Groundwater Monitoring
ARCO Station 2185, Oakland, California

March 15, 1993
62026.03

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

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
<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
<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
<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

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 surveyed on July 23, 1992 (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

March 15, 1993
62026.03

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

Well	TPHg	B	T	E	X
<u>MW-1</u>					
7-24-92	<50	<0.5	<0.5	<0.5	<0.5
10-19-92	<50	<0.5	<0.5	<0.5	<0.5
<u>MW-2</u>					
7-24-92	5,900	510	<10*	370	430
10-19-92	4,100	110	<10*	100	62
<u>MW-3</u>					
7-24-92		Not sampled - sheen			
10-19-92	42,000	740	1,100	1,500	5,700
<u>MW-4</u>					
7-24-92	<50	<0.5	<0.5	<0.5	<0.5
10-19-92	<50	<0.5	<0.5	<0.5	<0.5
MCL	--	1.0	--	680	1,750
DWAL	--	--	100	--	--

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.

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, EMCON'S WATER SAMPLE FIELD DATA SHEETS, CERTIFIED ANALYTICAL REPORTS WITH CHAIN OF CUSTODY RECORD, AND MONITORING WELL PURGE WATER TRANSPORT FORM



EMCON
ASSOCIATES

Consultants in Wastes
Management and
Environmental Control

JAN 10 1993

REC'D
OFFICE

Date December 18, 1992

Project OG70-054.01

6202603

To:

Mr. Joel Coffman

RESNA/ Applied Geosystems

3315 Almaden Expressway, Suite 34

San Jose, California 95118

We are enclosing:

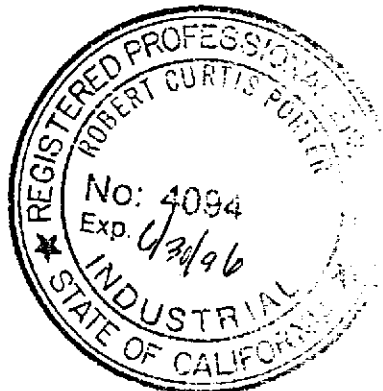
Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Results</u>
<u> </u>	<u>December 1992 monthly water level survey, ARCO</u>
<u> </u>	<u>station 2185, 9800 East 14th Street, Oakland, CA</u>

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 : 12-16-92

ARCO STATION # : 2185

FIELD TECHNICIAN : JAN GRAHAM

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	OK	YES	YES	3259	OK	12.20	12.20	ND	NR	23.6	-
2	MW-2	OK	YES	YES	3259	OK	11.70	11.70	ND	NR	23.6	-
3	MW-3	OK	YES	YES	3259	OK	11.73	11.73	ND	NR	23.3	-
4	MW-4	OK	YES	YES	3259	OK	12.45	12.45	ND	NR	23.8	-

SURVEY POINTS ARE TOP OF WELL CASINGS



EMCON
ASSOCIATES

Consultants in Wastes
Management and
Environmental Control

RECEIVED
DEC 4 - 1992

RESNA
SAN JOSE

Date December 3, 1992
Project 0G70-054.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95118

We are enclosing:

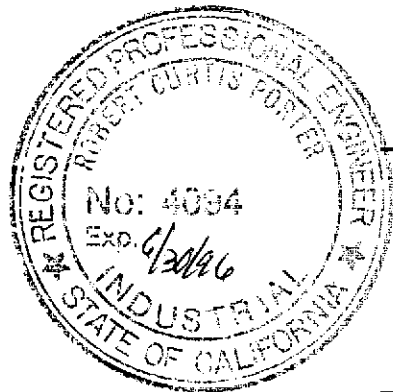
Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Results</u>
<u> </u>	<u>November 1992 monthly water level survey, ARCO</u>
<u> </u>	<u>station 2185, 9800 East 14th Street, Oakland, CA</u>

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 *AB*

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 : 11-23-92

ARCO STATION # : 2185

FIELD TECHNICIAN : J.G/M.G

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	OK	YES	YES	3257	OK	14.54	14.54	ND	NR	23.6	=
2	MW-2	OK	YES	YES	3259	OK	14.06	14.06	ND	NR	23.6	—
3	MW-3	OK	YES	YES	3259	OK	14.02	14.02	ND	NR	23.3	—
4	MW-4	OK	YES	YES	3259	OK	14.75	14.75	ND	NR	23.8	ANTIFREEZE AROUND BOX

SURVEY POINTS ARE TOP OF WELL CASINGS



EMCON
ASSOCIATES

Consultants in Wastes
Management and
Environmental Control

RECEIVED

NOV 9 - 1992

RESNA
SAN JOSE

Date November 5, 1992

Project OG70-054.01

To:

Mr. Joel Coffman

RESNA/ Applied Geosystems

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>4</u>	<u>Water Sample Field Data Sheets</u>

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the fourth quarter 1992 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 # : 0G70-054.01

STATION ADDRESS : 9800 East 14th Street, Oakland

DATE : 10-19-92

ARCO STATION # : 2185

FIELD TECHNICIAN : Madden

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	OK	Yes	OK	3259	OK	14.52	14.52	ND	ND	23.6	-
2	MW-2	OK	Yes	OK	3259	OK	14.09	14.09	ND	ND	23.6	-
3	MW-3	OK	Yes	OK	3259	OK	14.04	14.04	ND	ND	23.2	-
4	MW-4	OK	Yes	OK	3259	OK	14.74	14.74	ND	ND	23.8	-

SURVEY POINTS ARE TOP OF WELL CASINGS

Summary of Groundwater Monitoring Data
 Fourth Quarter 1992
 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)	10/19/92	14.52	ND. ²	<50.	<0.5	<0.5	<0.5	<0.5
MW-2(23)	10/19/92	14.09	ND.	4,100.	110.	<10.	100.	62.
MW-3(23)	10/19/92	14.04	ND.	42,000.	740.	1,100.	1,500.	5,700.
MW-4(23)	10/19/92	14.74	ND.	<50.	<0.5	<0.5	<0.5	<0.5

1. TPH. = Total petroleum hydrocarbons
 2. ND. = Not detected



October 30, 1992

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

Re: EMCON Project No. OG70-054.01
Arco Facility No. 2185

Dear Mr. Butera:

Enclosed are the results of the water samples submitted to our lab on October 19, 1992. For your reference, our service request number for this work is SJ92-1288.

All analyses were performed in accordance with the laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

A handwritten signature in black ink, appearing to read "Keoni A. Murphy".

Keoni A. Murphy
Laboratory Manager

A handwritten signature in black ink, appearing to read "Annelise J. Bazar".

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

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

Date Received: 10/19/92
 Work Order No.: SJ92-1288
 Sample Matrix: Water

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

Sample Name:	<u>MW-1 (23)</u>	<u>MW-2 (23)</u>	<u>MW-3 (23)</u>
Date Analyzed:	10/21/92	10/22/92	10/21/92

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	ND	110.	740.
Toluene	0.5	ND	<10. *	1,100.
Ethylbenzene	0.5	ND	100.	1,500.
Total Xylenes	0.5	ND	62.	5,700.
TPH as Gasoline	50	ND	4,100.	42,000.

TPH Total Petroleum Hydrocarbons
 MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit
 * Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kenneth Murphy Date: October 30, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

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

Date Received: 10/19/92
Work Order No.: SJ92-1288
Sample Matrix: Water

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

Sample Name: MW-4 (23) Method Blank Method Blank
Date Analyzed: 10/21/92 10/21/92 10/22/92

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit

Approved by: _____

K. O. Murphy

Date: _____

October 30, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Date Received: 10/19/92
 Work Order #: SJ92-1288

Initial Calibration Verification
 BTEX and TPH as Gasoline
 EPA Methods 5030/8020/DHS LUFT Method
 Nanograms

Date Analyzed: 10/21/92

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Benzene	250.	262.	105.	85-115
Toluene	250.	269.	108.	85-115
Ethylbenzene	250.	260.	104.	85-115
Total Xylenes	750.	751.	100.	85-115
TPH as Gasoline	2,500.	2,412.	96.	90-110

Date Analyzed: 10/22/92

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Benzene	250.	268.	107.	85-115
Toluene	250.	274.	109.	85-115
Ethylbenzene	250.	264.	106.	85-115
Total Xylenes	750.	760.	101.	85-115
TPH as Gasoline	2,500.	2,454.	98.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: *Keon Murphy* Date: *October 30, 1992*

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Date Received: 10/19/92
 Work Order No.: SJ92-1288
 Sample Matrix: Water

Matrix Spike/Duplicate Matrix Spike Summary
 TPH as Gasoline
 EPA Methods 5030/California DHS LUFT Method
 µg/L (ppb)

Date Analyzed: 10/21/92

Percent Recovery

Analyte	Spike Level	Sample Result	Spike Result		Percent Recovery		CAS Acceptance Criteria
			MS	DMS	MS	DMS	
TPH as Gasoline	250.	ND	265.	265.	106.	106.	70-130

TPH Total Petroleum Hydrocarbons
 ND None Detected at or above the method reporting limit

Approved by: *K. Com Amuly* Date: *October 30, 1992*

ARCO Facility no. 2185	City (Facility) OAKLAND	Project manager (Consultant) JIM BUTERA	Laboratory name CAS
ARCO engineer Kyle Christie	Telephone no. (ARCO) 415 571-2434	Telephone no. (Consultant) 408 453-0719	Contract number 07077
Consultant name EMCOV ASSOCIATES	Address (Consultant) 1938 Junction Avenue San Jose		

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 802/EPA 8020	BTEX/TPH EPA 802/8020/8015 CAF	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM509E	EPA 601/8010	EPA 624/8240	EPA 625/8270	Semi Metals VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CMM Metals EPA 8010/7000 TTL <input type="checkbox"/> STL <input type="checkbox"/>	Lead Org. IDHS Lead EPA 7420/421 <input type="checkbox"/>	Method of shipment Sampler will deliver		
			Soil	Water	Other	Ice	Acid																
MW-1(23) 12	2	2		X		X	HCl	10-19-92	1000		X										Special detection Limit/reporting Lowest Possible		
MW-2(23) 3-4	2	2		X		X	HCl		1040		X											Special QA/QC As Normal	
MW-3(23) 5b	2	2		X		X	HCl		1120		X												Remarks 2-40ml VOA's per well OG70-0540
MW-4(23) 2b	2	2		X		X	HCl		1205		X												

Condition of sample: OK		Temperature received: cool	
Relinquished by sampler MADLER	Date 10-19-92	Time 1308	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory [Signature]
	10-19-92	13:10	

Lab number 3192-1288
Turnaround time
Priority Rush 1 Business Day <input type="checkbox"/>
Rush 2 Business Days <input type="checkbox"/>
Expedited 5 Business Days <input type="checkbox"/>
Standard 10 Business Days <input checked="" type="checkbox"/>



WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-054.01
PURGED BY: M Adler
SAMPLED BY: M Adler

SAMPLE ID: MW-1 (23)
CLIENT NAME: Arco 2185
LOCATION: 9800 East 14th St.
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.): 5.95
DEPTH TO WATER (feet): 14.52 CALCULATED PURGE (gal.): 29.78
DEPTH OF WELL (feet): 23.6 ACTUAL PURGE VOL (gal.): 30.0

DATE PURGED: 10-19-92 Start (2400 Hr) 0942 End (2400 Hr) 0958
DATE SAMPLED: 10-19-92 Start (2400 Hr) 1000 End (2400 Hr) 1001

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>0945</u>	<u>6.0</u>	<u>6.23</u>	<u>508</u>	<u>66.1</u>	<u>Lt. brown</u>	<u>heavy</u>
<u>0948</u>	<u>12.0</u>	<u>6.38</u>	<u>510</u>	<u>65.5</u>	<u>Lt. brown</u>	<u>heavy</u>
<u>0952</u>	<u>18.0</u>	<u>6.57</u>	<u>505</u>	<u>65.0</u>	<u>Lt. brown</u>	<u>heavy</u>
<u>0955</u>	<u>24.0</u>	<u>6.66</u>	<u>501</u>	<u>65.4</u>	<u>Lt. brown</u>	<u>heavy</u>
<u>0958</u>	<u>30.0</u>	<u>6.74</u>	<u>500</u>	<u>65.4</u>	<u>Lt. brown</u>	<u>heavy</u>

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

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: OK LOCK #: 3255

REMARKS: _____

Meter Calibration: Date: 10-19-92 Time: 0934 Meter Serial #: 9112 Temperature °F: 66.4
(EC 1000 934 / 1000) (DI 26.6) (pH 7 7.01 / 7.00) (pH 10 9.97 / 10.00) (pH 4 4.01 /)
Location of previous calibration: MW-1 (23)
MADLER JB 1 4

WATER SAMPLE FIELD DATA SHEET



EMCON
ASSOCIATES

PROJECT NO: 0670-054.01
PURGED BY: MAdler
SAMPLED BY: MAdler

SAMPLE ID: MW-2 (23)
CLIENT NAME: Arco 2185
LOCATION: 9800 EAST 14th St.
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.): 6.23
DEPTH TO WATER (feet): 14.09 CALCULATED PURGE (gal.): 31.19
DEPTH OF WELL (feet): 23.6 ACTUAL PURGE VOL (gal.): 32.5

DATE PURGED: 10.19.92 Start (2400 Hr) 1021 End (2400 Hr) 1038
DATE SAMPLED: 10.19.92 Start (2400 Hr) 1040 End (2400 Hr) 1041

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (Visual)	TURBIDITY (Visual)
<u>1023</u>	<u>6.5</u>	<u>6.69</u>	<u>895</u>	<u>66.1</u>	<u>grey</u>	<u>heavy</u>
<u>1027</u>	<u>13.0</u>	<u>6.45</u>	<u>906</u>	<u>66.8</u>	<u>grey</u>	<u>heavy</u>
<u>1030</u>	<u>19.5</u>	<u>6.59</u>	<u>900</u>	<u>66.5</u>	<u>grey</u>	<u>heavy</u>
<u>1034</u>	<u>26.0</u>	<u>6.68</u>	<u>905</u>	<u>66.5</u>	<u>grey</u>	<u>heavy</u>
<u>1038</u>	<u>32.5</u>	<u>6.71</u>	<u>884</u>	<u>65.9</u>	<u>grey</u>	<u>heavy</u>

D. 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: OK LOCK #: 3259

REMARKS: _____

Meter Calibration: Date: 10.19.92 Time: 0934 Meter Serial #: 9112 Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)
Location of previous calibration: MW-1 (23)

Signature: M Adler Reviewed By: JB Page 2 of 4

WATER SAMPLE FIELD DATA SHEET



EMCON
ASSOCIATES

PROJECT NO: DG70-054.01

SAMPLE ID: MW-3 (23)

PURGED BY: M Adler

CLIENT NAME: Arco 2185

SAMPLED BY: M Adler

LOCATION: 9800 East 14th St.
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>NA</u>	VOLUME IN CASING (gal.): <u>6.01</u>
DEPTH TO WATER (feet): <u>14.03</u>	CALCULATED PURGE (gal.): <u>30.07</u>
DEPTH OF WELL (feet): <u>23.2</u>	ACTUAL PURGE VOL. (gal.): <u>30.5</u>

DATE PURGED: <u>10-19-92</u>	Start (2400 Hr) <u>1107</u>	End (2400 Hr) <u>1124</u>
DATE SAMPLED: <u>10-19-92</u>	Start (2400 Hr) <u>1126</u>	End (2400 Hr) <u>1127</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1110</u>	<u>6.5</u>	<u>6.30</u>	<u>662</u>	<u>69.8</u>	<u>grey</u>	<u>heavy</u>
<u>1113</u>	<u>12.5</u>	<u>6.24</u>	<u>643</u>	<u>68.5</u>	<u>grey</u>	<u>heavy</u>
<u>1116</u>	<u>18.5</u>	<u>6.34</u>	<u>635</u>	<u>68.6</u>	<u>grey</u>	<u>heavy</u>
<u>1120</u>	<u>24.5</u>	<u>6.55</u>	<u>626</u>	<u>68.7</u>	<u>grey</u>	<u>heavy</u>
<u>1124</u>	<u>30.5</u>	<u>6.46</u>	<u>622</u>	<u>69.1</u>	<u>grey</u>	<u>heavy</u>

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

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

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: OK LOCK #: 3259

REMARKS: _____

Meter Calibration: Date: 10-19-92 Time: 0934 Meter Serial #: 9112 Temperature °F: _____
 (EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)
 Location of previous calibration: MW-1 (23)

Signature: M Adler Reviewed By: JB Page 3 of 4

WATER SAMPLE FIELD DATA SHEET



EMCON
ASSOCIATES

PROJECT NO: 0670-054.01

SAMPLE ID: MW-4 (23)

PURGED BY: MAdler

CLIENT NAME: Aveo 2185

SAMPLED BY: MAdler

LOCATION: 9800 East 14th St.
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>5.96</u>
DEPTH TO WATER (feet):	<u>14.71</u>	CALCULATED PURGE (gal.):	<u>29.81</u>
DEPTH OF WELL (feet):	<u>23.8</u>	ACTUAL PURGE VOL (gal.):	<u>30.0</u>

DATE PURGED: <u>10-19-92</u>	Start (2400 Hr) <u>1147</u>	End (2400 Hr) <u>1203</u>
DATE SAMPLED: <u>10-19-92</u>	Start (2400 Hr) <u>1205</u>	End (2400 Hr) <u>1206</u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1150</u>	<u>6.0</u>	<u>7.04</u>	<u>517</u>	<u>64.1</u>	<u>brown</u>	<u>heavy</u>
<u>1153</u>	<u>12.0</u>	<u>6.85</u>	<u>512</u>	<u>66.5</u>	<u>brown</u>	<u>heavy</u>
<u>1154</u>	<u>18.0</u>	<u>6.63</u>	<u>508</u>	<u>67.4</u>	<u>brown</u>	<u>heavy</u>
<u>1159</u>	<u>24.0</u>	<u>6.69</u>	<u>505</u>	<u>67.8</u>	<u>brown</u>	<u>heavy</u>
<u>1203</u>	<u>30.0</u>	<u>6.72</u>	<u>506</u>	<u>67.8</u>	<u>brown</u>	<u>heavy</u>

D. O. (ppm): NR ODOR: MOD 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: OK LOCK #: 3259

REMARKS: _____

Meter Calibration: Date: 10-19-92 Time: 0934 Meter Serial #: 9112 Temperature °F: _____
 (EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-4 (23)

Signature: MAdler Reviewed By: JB Page 4 of 4

MONITORING WELL PURGE WATER TRANSPORT FORM

GENERATOR INFORMATION

NAME: ARCO PRODUCTS

ADDRESS: P.O. BOX 5811

CITY, STATE, ZIP: SAN MATEO, CA 94402 PHONE #: (415) 571-2434

DESCRIPTION OF WATER: PURGE WATER GENERATED DURING SAMPLING OR DEVELOPMENT OF MONITORING WELLS LOCATED AT VARIOUS SITES. AUGER RINSATE GENERATED DURING THE INSTALLATION OF MONITORING WELLS AT VARIOUS SITES. THE WATER MAY CONTAIN DISSOLVED HYDROCARBONS.

THE GENERATOR CERTIFIES THAT THIS WATER AS DESCRIBED IS NON-HAZARDOUS

KYLE CHRISTIE *by Jon De Lon* 11/12/92
 (Typed or printed full name & signature) (Date)

SITE INFORMATION

	STA #	JOB #	ADDRESS	GALS
1	A-2133	21240-PW	2908 BENJAMIN HOLT DR., STOCKTON, CA	84
2	A-716	21175-PW	699 SAN ANTONIO RD., PALO ALTO, CA	120
3	A-440	21262-PW	600 PORTOLA ST., SAN FRANCISCO, CA	12
4	A-1326	21176-PW	840 SAN ANTONIO RD., PALO ALTO, CA	226
5	A-5662	21293-PW	OROVILLE DAM RD., OROVILLE, CA	122
6	A-2035	21179-PW	1001 SAN PABLO AVE., ALBANY, CA	129
7	A-601	21195-DW	712 LEWELLING BLVD., SAN LEANDRO, CA	118
8	A-2152	21174-PW	22141 CENTER ST., CASTRO VALLEY, CA	114
9	A-2162	21131-PW	15135 HESPERIAN BLVD., SAN LEANDRO, CA	104
10	A-2076	21193-DW	800 E. KETTLEMAN LANE, LODI, CA	583
11	A-2185	21186-PW	9800 E. 14TH AVE., OAKLAND, CA	104
TOTAL GALLONS:				1,716

TRANSPORTER INFORMATION

NAME: BALCH PETROLEUM

ADDRESS: 930 AMES AVE.

CITY, STATE, ZIP: MILPITAS, CA 95035 PHONE #: (408) 942-8686

TRUCK ID #: PETERBILT HURSCHEL WARD *Hurschel Ward* 11-13-92
 (Typed or printed full name & signature) (Date)

TSD FACILITY INFORMATION

NAME: GIBSON ENVIRONMENTAL

ADDRESS: 475 SEAPORT BLVD

CITY, STATE, ZIP: REDWOOD CITY, CA 94063 PHONE #: (415) 368-5511

RELEASE #: 11320 Shawn Raghi 11-13-92
 (Typed or printed full name & signature) (Date)