Applied GeoSystems, Inc.
A RESNA Company

RESNA
Working To Restore Nature

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TRANSMITTAL

92 MAY -5 AM 8:50

TO: MR. LARRY SETO
ACHCSA-DEH
80 SWAN WAY, ROOM 200
OAKLAND, CALIFORNIA 94621

DATE: 5/4/92
PROJECT NUMBER: 69036.04
SUBJECT: ARCO STATION 2035, 1001 SAN PABLO AVENUE, ALBANY, CALIFORNIA.

FROM: LOU LEET
TITLE: STAFF GEOLOGIST

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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
First Quarter 1992
at
ARCO Station 2035
1001 San Pablo Avenue
Albany, California

69036.04

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May 1, 1992
0407MWHE
69036.04

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

Subject: First Quarter 1992 Groundwater Monitoring Report for ARCO Station 2035, 1001 San Pablo Avenue, Albany, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), this letter report summarizes the results of the first quarter 1992 groundwater monitoring performed by ARCO contractor, EMCON Associates (EMCON) of San Jose, 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 waste-oil and former underground gasoline-storage tanks at the site. The field work and laboratory analyses of groundwater samples during this quarter was performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of petroleum product, collecting groundwater samples form the wells for laboratory analyses, and directing a State-certified laboratory to analyze the groundwater samples. Field procedures and acquisition of field data were performed under the direction of EMCON; evaluation and warrant of their field data and field protocols is beyond RESNA Industries' (RESNA's) scope of work. RESNA's scope of work was limited to interpretation of field and laboratory analyses 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 2035 is located southeast of the intersection of Marin and San Pablo Avenues in Albany, California, as shown on the Site Vicinity Map, Plate 1.

Prior to the present monitoring, RESNA performed investigations related to the underground waste-oil and gasoline-storage tanks at the site. Four underground gasoline-storage tanks were excavated and removed from the site in July and August 1991, including

one 6,000-gallon underground gasoline-storage tank (T1), two 4,000-gallon underground gasoline-storage tanks (T2 and T3), and one 10,000-gallon underground gasoline-storage tank (T4). The removed gasoline-storage tanks were replaced with four 10,000 gallon gasoline-storage tanks (T1 through T4). A 550-gallon waste-oil tank was removed from the site in 1977 during ARCO's conversion of the station to a mini-market. The approximate locations of the underground storage tanks (USTs), the former waste-oil tank, and other pertinent features at the site are shown on Plate 2, Generalized Site Plan.

Groundwater Sampling and Gradient Evaluation

Depth to water measurements (DTW) were performed by EMCON field personnel on January 19, February 19, and March 19, 1992. Quarterly sampling was performed by EMCON field personnel on March 19, 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-3, and RW-1, are presented on EMCON's field report sheets, and EMCON's Summary of Groundwater Monitoring Data. These data are included in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective observations of product in the groundwater for this quarter and previous groundwater monitoring at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. EMCON's DTW measurements were used to evaluate the groundwater elevations. Up to 3.35 feet of floating product was recorded in recovery well RW-1, which was subsequently removed from the well. Evidence of product or sheen was not noted in the other monitoring wells. Groundwater elevations in wells MW-1 through MW-3, and RW-1, increased approximately 1.5 feet between January 19 and March 19, 1992. The groundwater gradient evaluated from January, February, and March 1992 data is shown on the Groundwater Gradient Maps, Plates 3 through 5. The interpreted groundwater gradients averaged approximately 0.01 toward the southwest. This gradient is consistent with the November 1991 monitoring data but deviates from the initial interpreted gradient direction inferred from the October 1991 monitoring data. Fluctuations in the gradient direction may be due to local high volume pumping or other unknown causes.

Groundwater monitoring wells MW-1 through MW-3 were purged and sampled by EMCON field personnel on March 19, 1992; RW-1 was not sampled because floating product was present. Prior to groundwater sampling, approximately five well volumes were purged from MW-1 and MW-2, and three well volumes were purged from MW-3. Reportedly, Well MW-3 was dewatered after three well volumes were purged. 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; the Monitoring Well Purge Water Disposal From is also included in Appendix A.

Laboratory Methods and Analyses

Under the direction of EMCON, water samples collected from the wells were analyzed by Columbia Analytical Services, Inc. (California Department of Health Services Certification No. 1426). The water samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and for benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8020. Results of these and previous water analyses are summarized in Table 2, Cumulative Results of Groundwater Laboratory Analyses. The TPHg and benzene concentrations are shown on Plate 6, the TPHg Concentration in Groundwater Map, and Plate 7, the Benzene Concentration in Groundwater Map. The Chain of Custody Records and Laboratory Analyses Reports are included in Appendix A.

Results of this quarter's monitoring indicate:

- Concentrations of TPHg were reported as 6,500 parts per billion (ppb) in well MW-1, 2,100 ppb in well MW-3, and as nondetectable (<50 ppb) in wells MW-2.
- Concentrations of benzene were reported as 2,600 ppb in MW-1, 780 ppb in well MW-3, and 6.8 ppb in well MW-2.
- Concentrations of toluene were reported as 89 ppb in well MW-1, 8.8 ppb in well MW-3, and 0.9 ppb in well MW-2.
- Concentrations of ethylbenzene were reported as 42 ppb in well MW-1, 16 ppb in well MW-3, and as nondetectable (<0.5 ppb) in MW-2.
- Concentrations of total xylenes were reported as 290 ppb in well MW-1, 58 ppb in well MW-3, and 1.1 ppb in well MW-2.

The following general trends were noted in reported hydrocarbon concentrations in groundwater from the three monitoring wells since the last quarterly monitoring. Concentrations of TPHg and benzene increased in wells MW-1 and MW-3; and were generally consistent in MW-2, with results of initial quarterly monitoring data from October 1991.

Product Removal

Floating product was measured and removed from well RW-1 on January 29, February 28, March 12, and March 25, 1992. Quantities of floating product recovered during first quarter 1992 are presented in Table 3, Approximate Cumulative Product Recovered. In April a Horner EZY Floating Product Skimmer was installed in well RW-1. The total cumulative recovered product from RW-2 is approximately 15.8 gallons.

Conclusions and Recommendations

Groundwater has been impacted by petroleum hydrocarbons. The extent of petroleum hydrocarbons in the local groundwater has not been defined.

RESNA recommends monthly groundwater monitoring and quarterly groundwater sampling at the site, including analyses of the groundwater for TPHg and BTEX. In addition, RESNA recommends biweekly measurement and removal of product from the skimmer installed in well RW-1. Additional recommendations will be submitted under separate cover.

Schedule

Monthly groundwater monitoring and quarterly groundwater sampling will continue to be performed by ARCO's contracted field sampler. Biweekly site visits will be conducted to measure and remove floating product collected in the product skimmer. A work plan for future work at the site will be initiated.

RESNA recommends that copies of this report be forwarded to:

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

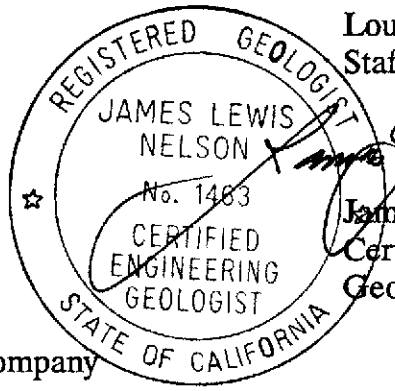
Mr. Eddy So
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

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

Sincerely,
RESNA Industries

L. L. Leet

Lou Leet
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, January 19, 1992
Plate 4, Groundwater Elevation Map, February 19, 1992
Plate 5, Groundwater Elevation Map, March 19, 1992
Plate 6, Concentration of TPHg in Groundwater, March 19, 1992
Plate 7, Concentration of Benzene in Groundwater, March 19, 1992

Table 1, Cumulative Groundwater Monitoring Data
Table 2, Results of Laboratory Analyses of Water Samples
Table 3, Approximate Cumulative Product Recovered

Appendix A: EMCON's Field Report Sheets (2), Depth to Water/Floating Product Survey Results, Summary of Groundwater Monitoring Data, Certified Analytical Reports with Chain-of-Custody, and Water Sample Field Data Sheets
Monitoring Well Purge Water Disposal Form

REFERENCES

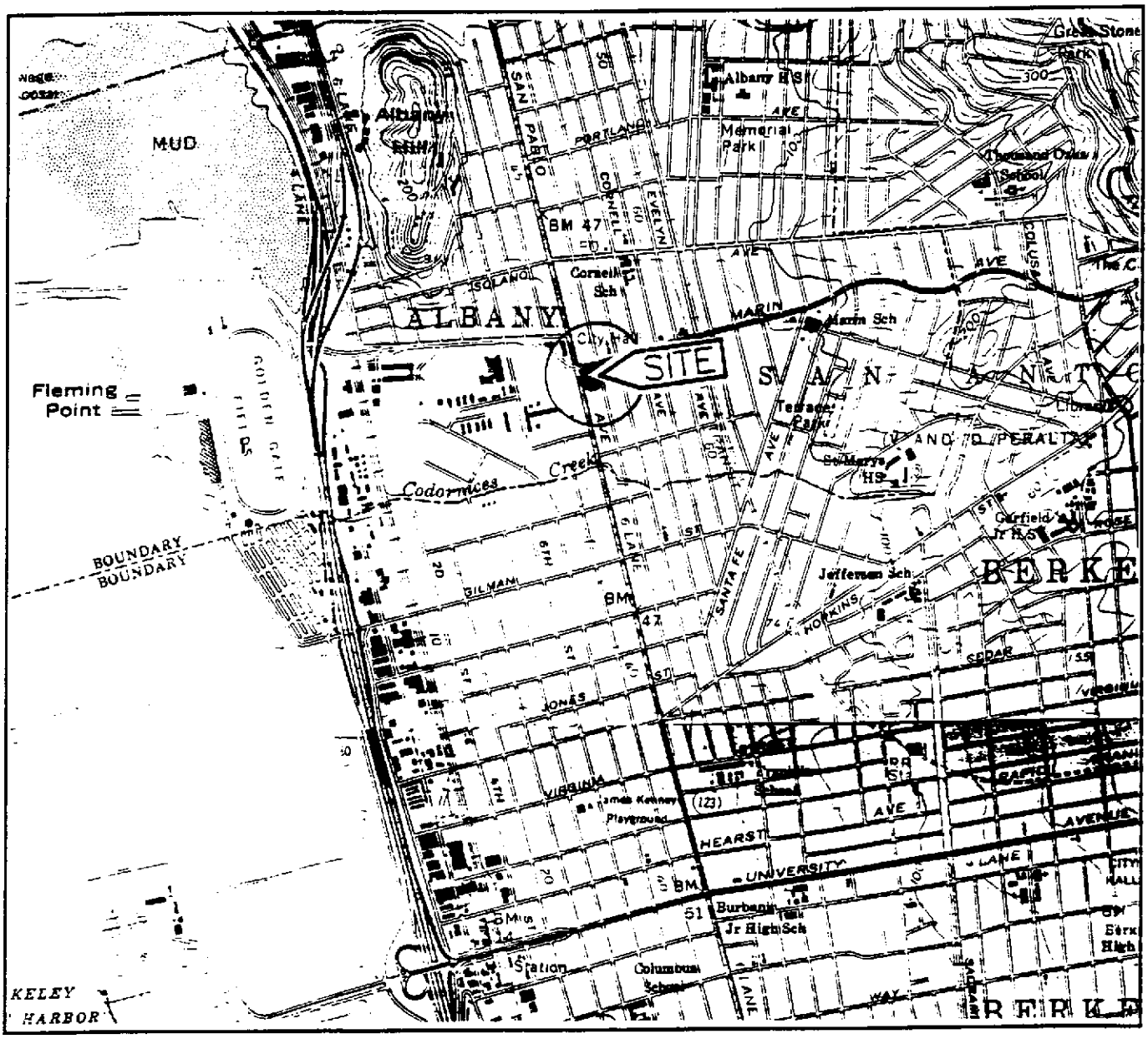
Applied GeoSystems. January 24, 1990. Limited Environmental Site Assessment at ARCO Station 2035. AGS 96036-1.

RESNA/Applied GeoSystems. April 29, 1991. Work Plan for Subsurface Investigations and Remediation at ARCO Station 2035, 1001 San Pablo Avenue, Albany, California. AGS 69036.02.

RESNA/Applied GeoSystems. April 29, 1991. Addendum One to Work Plan at ARCO Station 2035, 1001 San Pablo Avenue, Albany, California. AGS 69036.02

RESNA/Applied GeoSystems. June 24, 1991. Site Safety Plan for the ARCO Service Station No.2035, 1001 San Pablo Avenue, Albany, California. AGS 69036.03S.

RESNA/Applied GeoSystems. September 11, 1991. Underground Gasoline-Storage Tank Removal and Replacement. AGS 69036.03.



Base: U.S. Geological Survey
7.5-Minute Quadrangle
Richmond/Oakland West, California
Photorevised 1980

N

LEGEND

⊙ = Site Location

Approximate Scale

2000 1000 0 2000 4000

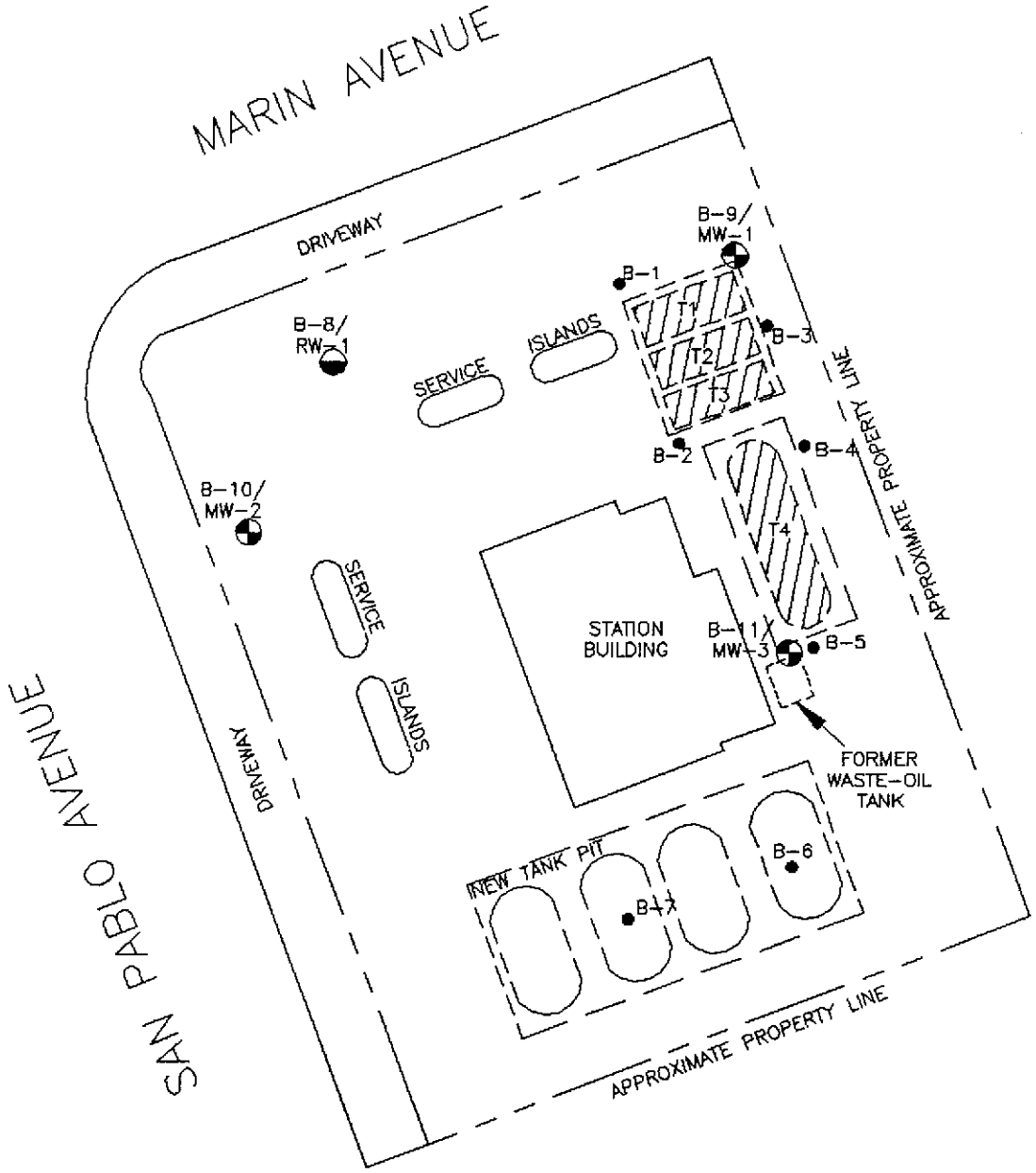
feet

RESNA

PROJECT 69036.04

SITE VICINITY MAP
ARCO Station 2035
1001 San Pablo Avenue
Albany, California

PLATE
1



EXPLANATION

RW-1 = Recovery well (Exceltech, October 1991)

MW-3 = Monitoring well (Exceltech, October 1991)

B-5 = Soil boring (RESNA, August 1989 and June 1991)

T1 = Former underground gasoline tank pits

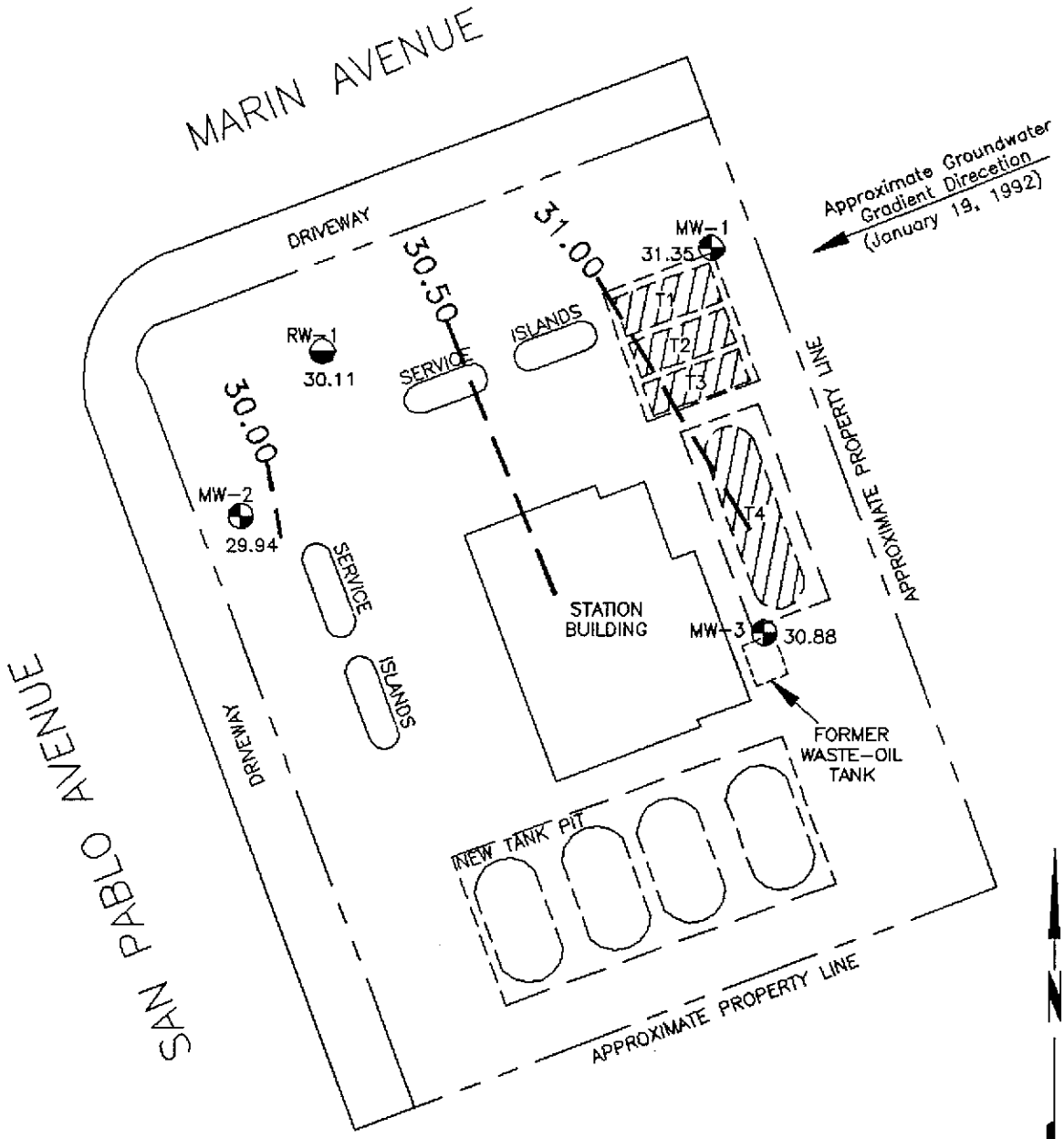
Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by John E. Koch, Land Surveyor.

RESNA	**GENERALIZED SITE PLAN** **ARCO Station 2035** **1001 San Pablo Avenue** **Albany, California**	**PLATE** **2**
PROJECT 69036.04		



EXPLANATION

RW-1 = Recovery well (Exceltech, October 1991)

MW-3 = Monitoring well (Exceltech, October 1991)

= Former underground gasoline tank pits

31.00 = Line of equal elevation of groundwater in feet above mean sea level (MSL) (January 19, 1992)

31.35 = Elevation of groundwater in feet (MSL) (January 19, 1992)

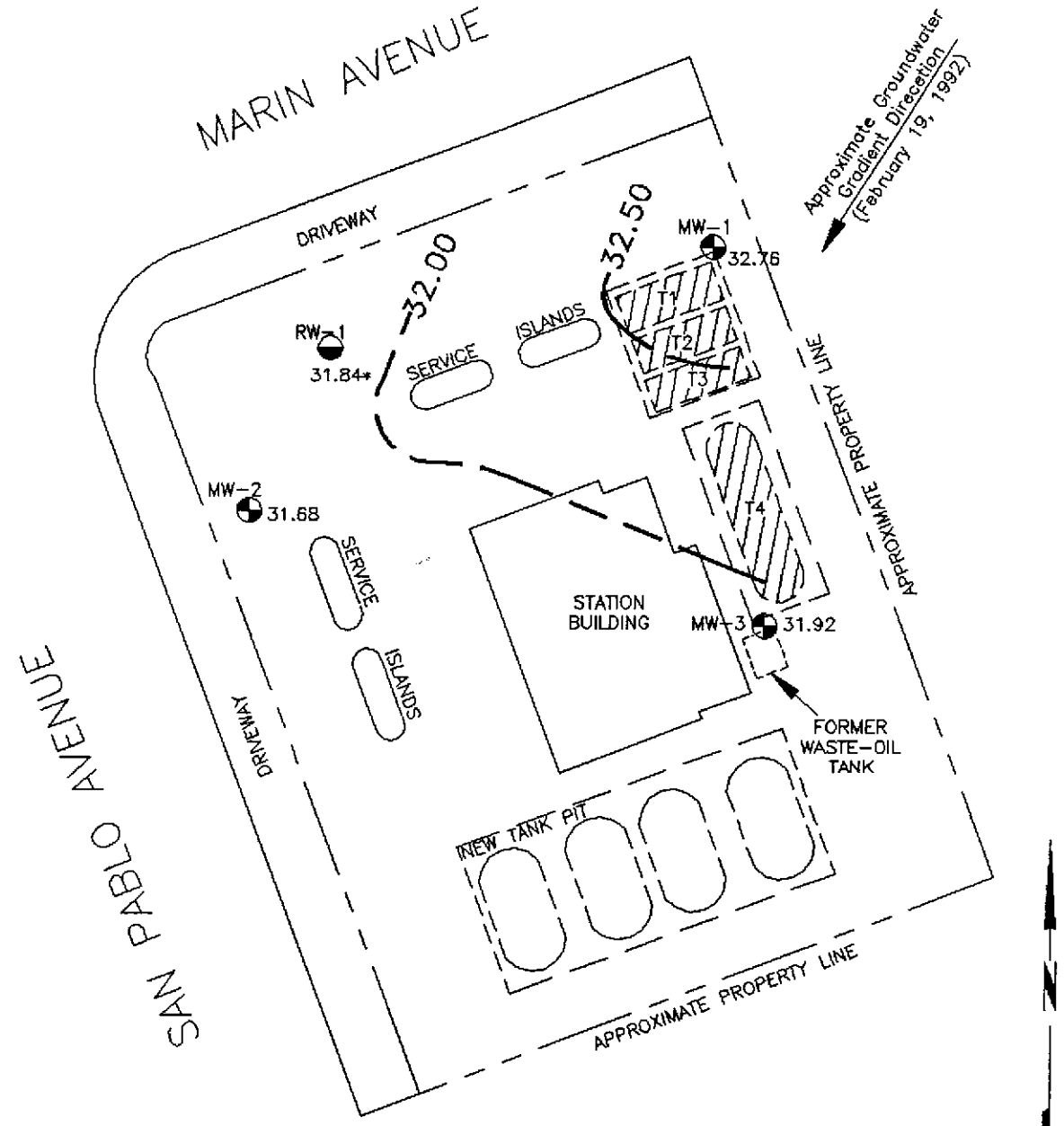
Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by John E. Koch, Land Surveyor.

RESNA	**GROUNDWATER GRADIENT MAP**	**PLATE**
	ARCO Station 2035	**3**
PROJECT 69036.04	**1001 San Pablo Avenue**	
	Albany, California	



EXPLANATION

RW-1 = Recovery well (Exceltech, October 1991)

MW-3 = Monitoring well (Exceltech, October 1991)

= Former underground gasoline tank pits

32.50 = Line of equal elevation of groundwater in feet above mean sea level (MSL) (February 19, 1992)

32.76 = Elevation of groundwater in feet (MSL) (February 19, 1992)

* = Floating product

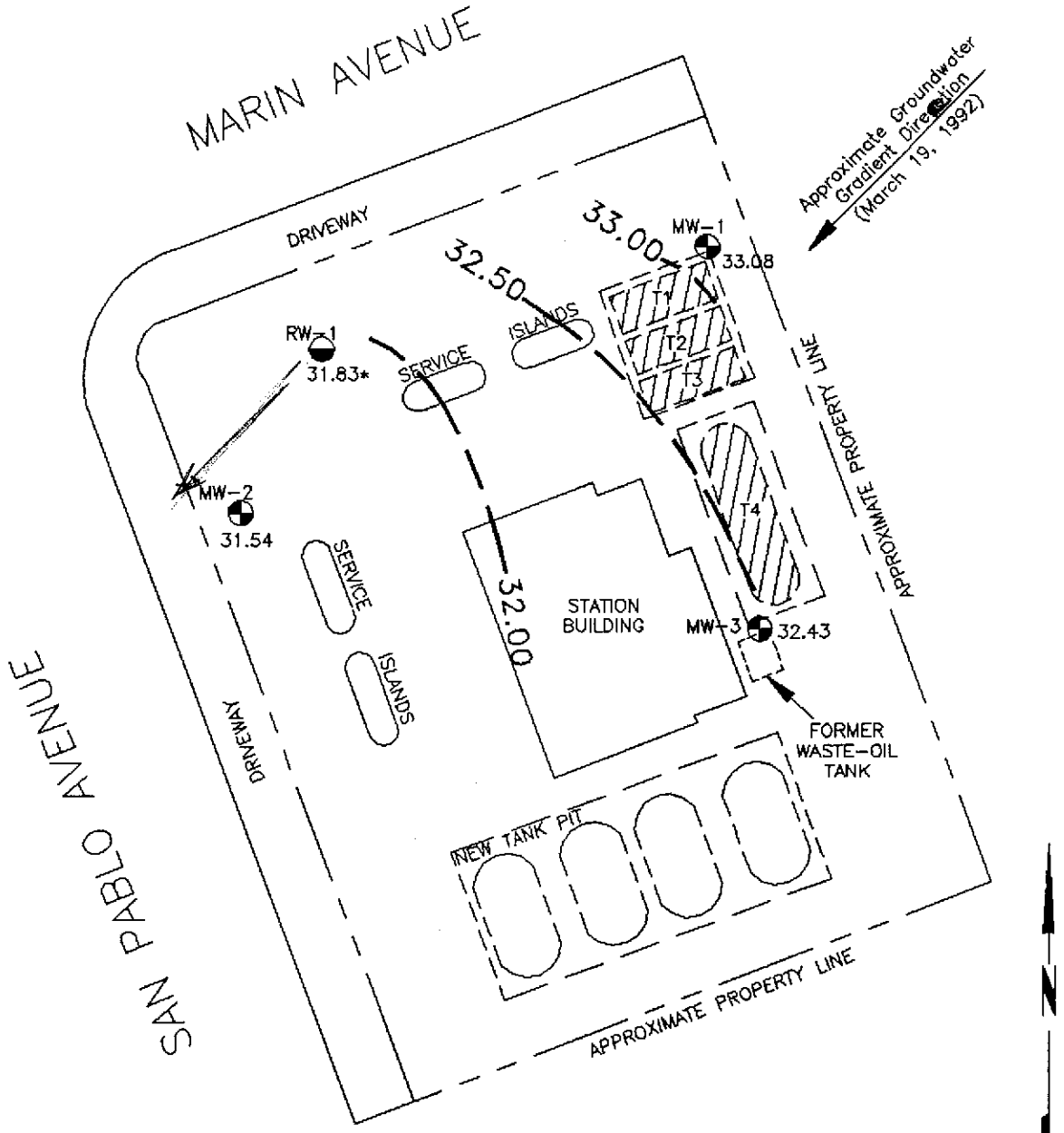
Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by John E. Koch, Land Surveyor.

RESNA	**GROUNDWATER GRADIENT MAP**	**PLATE**
	ARCO Station 2035	**4**
PROJECT 69036.04	**1001 San Pablo Avenue**	
	Albany, California	



EXPLANATION

RW-1 = Recovery well (Exceltech, October 1991)

MW-3 = Monitoring well (Exceltech, October 1991)

= Former underground gasoline tank pits

33.00 = Line of equal elevation of groundwater in feet above mean sea level (MSL) (March 19, 1992)

33.08 = Elevation of groundwater in feet (MSL) (March 19, 1992)

* = Floating product

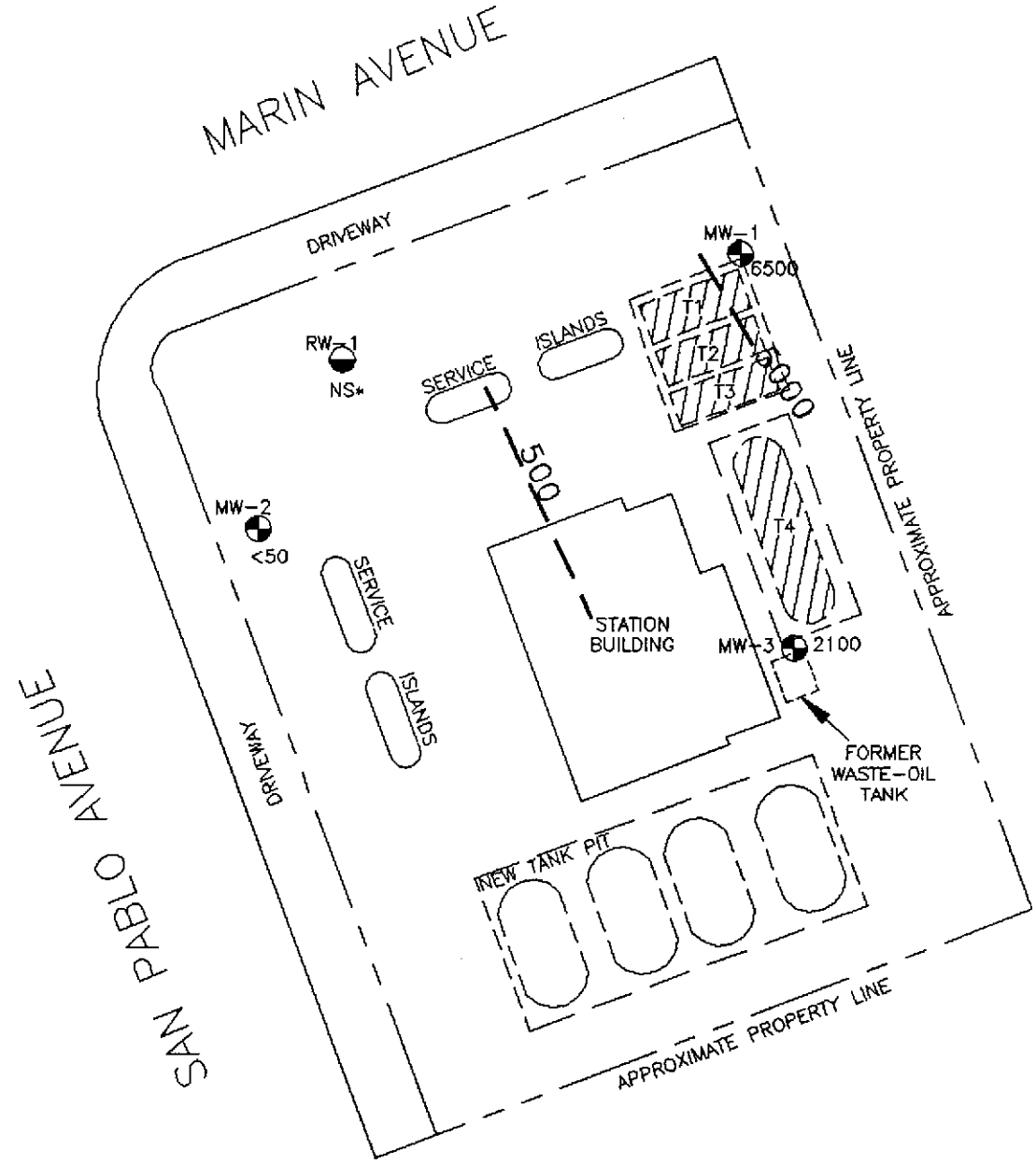
Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by John E. Koch, Land Surveyor.

RESNA	**GROUNDWATER GRADIENT MAP** **ARCO Station 2035** **1001 San Pablo Avenue** **Albany, California**	**PLATE** **5**
PROJECT 69036.04		



EXPLANATION

RW-1 = Recovery well (Exceltech, October 1991)

MW-3 = Monitoring well (Exceltech, October 1991)

= Former underground gasoline tank pits

5000 = Line of equal concentration of TPHg in ppb in groundwater (March 19, 1992)

6500 = Concentration of TPHg in ppb in groundwater (March 19, 1992)

* = Floating product

NS = Not sampled

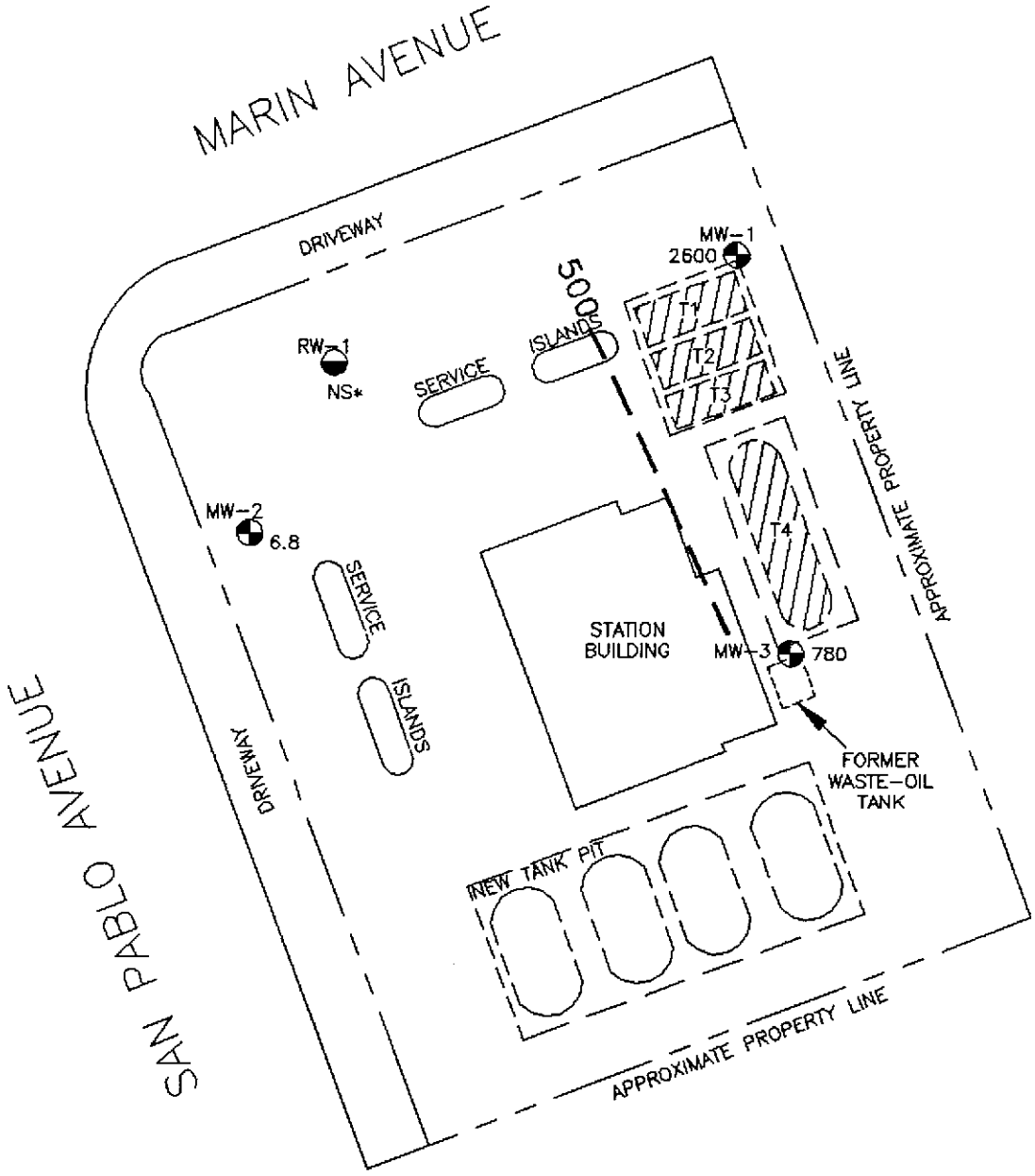
Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by John E. Koch, Land Surveyor.

RESNA	**CONCENTRATION OF TPHg IN GROUNDWATER ARCO Station 2035 1001 San Pablo Avenue Albany, California**	**PLATE 6**
PROJECT 69036.04		



EXPLANATION

RW-1 = Recovery well (Exceltech, October 1991)

MW-3 = Monitoring well (Exceltech, October 1991)

= Former underground gasoline tank pits

500 = Line of equal concentration of benzene in ppb in groundwater (March 19, 1992)

2600 = Concentration of benzene in ppb in groundwater (March 19, 1992)

* = Floating product

NS = Not sampled

Approximate Scale

30 15 0 30 60

feet

Source: Surveyed by John E. Koch, Land Surveyor.

RESNA

PROJECT 69036.04

CONCENTRATION OF BENZENE IN GROUNDWATER
ARCO Station 2035
1001 San Pablo Avenue
Albany, California

PLATE 7

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2035
Albany, California

Well / Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Evidence of Product (feet)
MW-1				
10/29/91	41.41	11.86	29.55	None
11/07/91		10.94	30.47	None
11/14/91		10.97	30.44	None
01/19/92		10.06	31.35	None
02/19/92		8.65	32.76	None
03/19/92		8.33	33.08	None
MW-2				
10/29/91	40.38	11.10	29.28	None
11/07/91		11.20	29.18	None
11/14/91		11.21	29.17	None
01/19/92		10.44	29.94	None
02/19/92		8.70	31.68	None
03/19/92		8.84	31.54	None
MW-3				
10/29/91	41.44	11.62	29.82	None
11/07/91		11.52	29.92	None
11/14/91		11.50	29.94	None
01/19/92		10.56	30.88	None
02/19/92		9.52	31.92	None
03/19/92		9.01	32.43	None
RW-1				
10/29/91	40.33	10.85	29.48	Sheen
11/07/91		11.97	28.36	0.01
11/14/91		11.03	29.30	0.01
01/19/92		10.22*	30.11*	3.26
02/19/92		8.49*	31.84*	2.14
03/19/92		8.50*	31.83*	0.5

Wellhead Elevation based on benchmark (B1198): A standard Bronze Disk in the sidewalk 0.8' behind the face of curb on the northerly side of Marin Avenue 6' +/- westerly of the curb return at the northeast corner of Marin Avenue and San Pablo Avenue at an elevation of 40.426 feet above mean sea level, City of Albany, California.
Depth-to-water measurements in feet below the top of the well casing.
*Adjusted water level due to product. The static water level in each well that was suspected to contain floating product was measured with an ORS® interface probe; this instrument is accurate to the nearest 0.01 foot. The probe contains two different sensor units, one for detecting the liquid/air interface, and one for distinguishing between water and hydrocarbon. The thickness of the floating product and the groundwater depths in each well were recorded. The recorded thickness of the floating product was then multiplied by 0.80 to obtain an approximate value for the displacement of water by the floating product. This approximate displacement value was then subtracted from the measured depth to water to obtain a calculated depth to water. These calculated groundwater depths were subtracted from surveyed wellhead elevations to calculate the differences in groundwater elevations.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES
ARCO Station 2035
Albany, California

WELL DATE	TPHg	B	T	E	X	TOG	VOC	Cd	Cr	Pb	Ni	Zn
MW-1												
10/29/91	620	76	69	15	60	NA	NA	NA	NA	NA	NA	NA
03/19/92	6,500	2,600	89	42	290	NA	NA	NA	NA	NA	NA	NA
MW-2												
10/29/91	<60	2.4	4.6	0.48	2.3	NA	ND	NA	NA	NA	NA	NA
03/19/92	<50	6.8	0.9	<0.5	1.1	NA	NA	NA	NA	NA	NA	NA
MW-3												
10/29/91	32	2.1	2.8	0.35	1.8	<5.0	ND*	<0.010	<0.010	<0.0050	<0.050	0.045
03/19/92	2,100	780	8.8	16	58	NA	NA	NA	NA	NA	NA	NA
RW-1												
10/29/91	Not sampled–sheen											
03/19/92	Not sampled–floating product											
MCL:		1		680	1,750			10	50	50	—	—
DWAL:			100									

Results in parts per billion (ppb).
TPHg: Total petroleum hydrocarbons as gasoline by EPA method 5030/8015/8020.
B: benzene, T: toluene, E: ethylbenzene, X: total xylenes isomers
BTEX: Analyzed by EPA method 5030/8015/8020.
TOG: Total oil and grease by Standard method 5520 B&F.
VOC: Volatile organic compounds by EPA method 624.
*: All compounds were nondetectable except for toluene (3.0 ppb).
Cd: Cadmium by EPA method 200.7.
Cr: Chromium by EPA method 200.7.
Ni: Nickel by EPA method 200.7.
Zn: Zinc by EPA method 200.7.
Pb: Lead by EPA method 3010.
NA: Not analyzed.
<: Results reported below the laboratory detection limit.
ND: Not detected; detection limit varied according to analyte.

Sample Identification: W-11-MW3
- W-11-MW3: Monitoring well number
- W-11-MW3: Depth in feet
- W-11-MW3: Water Sample

TABLE 3
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 2035
Albany, California

Well Date	Product Thickness (feet)	Product Recovered (gallons)
YEAR: 1992		
RW-1		
01/29/92	3.35	5.0
02/28/92	2.58	3.8
03/12/92	1.28	2.0
03/25/92	0.91	0.5
	1992 TOTAL:	15.8

APPENDIX A
EMCON'S FIELD REPORT SHEETS (2),
DEPTH TO WATER/FLOATING PRODUCT SURVEY RESULTS,
SUMMARY OF GROUNDWATER MONITORING DATA,
CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY, AND
WATER SAMPLE FIELD DATA SHEETS

MONITORING WELL PURGE WATER DISPOSAL FORM

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

Date April 1, 1992
Project G70-17.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Alamden Expressway, Suite 34
San Jose, California 95050

We are enclosing:

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

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the first quarter 1992 monitoring event at ARCO service station 2035, 1001 San Pablo Avenue, Albany, California. Please call if you have any questions:.(408) 453-2266.

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER
ROBERT CURTIS PORTER
No: 4034
Exp. 6/30/92
INDUSTRIAL
STATE OF CALIFORNIA

Mark Knuttel MK

Robert Porter, Senior Project Engineer.

1938 Junction Avenue, San Jose, California 95131-2102 (408) 453-7310 Fax (408) 453-9452

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-17.01 STATION ADDRESS : 1001 San Pablo Ave. Albany, CA DATE : 3-19-92

ARCO STATION # : 2035 FIELD TECHNICIAN : BUTERA DAY : Thursday

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	yes	8.38	9.38	ND	NA	24.6	—
2	MW-2	ok	yes	yes	3259	yes	8.84	8.84	ND	NA	28.7	—
3	MW-3	ok	yes	yes	3259	yes	9.01	9.00	ND	NA	31.9	—
4	RW-1	ok	yes	ok	NO	NO	8.91	8.90	8.85	0.5	~~30.7~~ 28.7	NO well cap at all only duct tape over well opening.

Summary of Groundwater Monitoring Data
First Quarter 1992
ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California
micrograms per liter (µg/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(29)	03/19/92	8.38	ND.[2]	6,500.	2,600.	89.	42.	290.
MW-2(28)	03/19/92	8.84	ND.	<50	6.8	0.9	<0.5	1.1
MW-3(31)	03/19/92	9.01	ND.	2,100.	780.	8.8	16.	58.
RW-1	NS.[3]	8.91	0.5	NS.	NS.	NS.	NS.	NS.
FB-1[4]	03/19/92	NA.[5]	NA.	<50	<0.5	<0.5	<0.5	<0.5

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NS. = Not sampled; well was not sampled due to detection of floating product
4. FB. = Field blank
5. NA. = Not applicable

Columbia Analytical Services INC.

March 31, 1992

Mr. Mark Knuttel
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **EMCON Project No. G70-17.01**
Arco Facility No. 2035

Dear Mr. Knuttel:

Enclosed are the results of the water samples submitted to our lab on March 20, 1992. For your reference, our service request number for this work is SJ92-0285.

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

Please call if you have any questions.

Respectfully submitted:

Keoni A. Murphy
COLUMBIA ANALYTICAL SERVICES, INC.

le/KAM

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. G70-17.01
Arco Facility No. 2035

Date Received: 03/20/92
Work Order #: SJ92-0285
Sample Matrix: Water

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

Sample Name:		MW-1 (29)	MW-2 (28)	MW-3 (31)
Date Analyzed:		03/24/92	03/24/92	03/24/92
Analyte	**MRL**			
Benzene	0.5	2,600.	6.8	780.
Toluene	0.5	89.	0.9	8.8
Ethylbenzene	0.5	42.	ND	16.
Total Xylenes	0.5	290.	1.1	58.
TPH as Gasoline	50	6,500.	ND	2,100.

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

Approved by Kevin A Murphy Date March 31, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. G70-17.01
Arco Facility No. 2035

Date Received: 03/20/92
Work Order #: SJ92-0285
Sample Matrix: Water

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

Sample Name:		FB-1	Method Blank
Date Analyzed:		03/24/92	03/24/92
Analyte	**MRL**		
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
TPH as Gasoline	50	ND	ND

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

Approved by Kevin Murphy Date March 31, 1992

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

Client: EMCON Associates
Project: EMCON Project No. G70-17.01
Arco Facility No. 2035

Date Received: 03/20/92
Work Order #: SJ92-0285
Sample Matrix: Water

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

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (29)	03/24/92	85.
MW-2 (28)	03/24/92	88.
MW-3 (31)	03/24/92	104.
FB-1	03/24/92	84.
Method Blank	03/24/92	85.
	CAS Acceptance Criteria	70-130

TPH Total Petroleum Hydrocarbons

Approved by Kevin A Murphy Date March 31, 1992

APPENDIX B

CHAIN OF CUSTODY

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no. 2035 | City (Facility) Albany | Project manager (Consultant) Mark Knuttel | Laboratory name CAS

ARCO engineer Kyle Christie | Telephone no. (ARCO) 415-571-2434 | Telephone no. (Consultant) 408-453-0719 | Fax no. (Consultant) 408-453-0452

Contract number 07077

Consultant name EMCON Associates | Address (Consultant) 1938 Junction Ave. San Jose, CA

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time
W-1(25)	1-2	2		X		X	HCl	3.19	1200
W-2(28)	3-4	2		X		X	HCl	3.19	1305
W-3(31)	5-6	2		X		X	HCl	3.19	
~~W-4( )~~	~~NO~~	~~SAMPLE 2~~		~~PRODUCT X~~		~~IN X~~	~~HCl~~	~~WELL~~	
B-1	7-8	2		X		X	HCl	3.19	—
W-3(31)		1		X		X	HNO_3	3/19	1430

Sample I.D.	BTEX 602/EPA 8020	BTEX/TPH Gas EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☑		
W-1(25)		X											
W-2(28)		X											
W-3(31)		X											
~~W-4( )~~		~~X~~											
B-1		X											
W-3(31)											X		

Method of shipment: Sampler will delivery

Special detection Limit/reporting: Lowest Possible

Special QA/QC: normal

Remarks: G70-17.01
TPH-g / BTXE
2 - 40 ml VOA HCl

Total lead
1-500 ml LPE HNO_3
- NOT FILTERED -

Lab number: SJ92-0285

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

Condition of sample: OK | Temperature received: cool

Relinquished by sampler	Date	Time	Received by	Date	Time
[signature]	3-20-92	0800	[signature]	3-20-92	8:00

Relinquished by	Date	Time	Received by

Relinquished by	Date	Time	Received by laboratory	Date	Time

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APC-3292 (2-91)

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670-17.01 SAMPLE ID: MW-2 (38)

PURGED BY: JBUTERA CLIENT NAME: ARCO 2035

SAMPLED BY: JBUTERA LOCATION: Albany CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	13.0
DEPTH TO WATER (feet):	8.85	CALCULATED PURGE (gal.):	65.0
DEPTH OF WELL (feet):	28.7	ACTUAL PURGE VOL. (gal.):	65.0

DATE PURGED: 3.19.92 Start (2400 Hr) 1230 End (2400 Hr) 1300

DATE SAMPLED: 3.19.92 Start (2400 Hr) 1305 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1235	13.0	6.71	807	68.2	Cloudy	MOD
1241	26.0	6.70	795	67.3	"	"
1247	39.0	6.64	796	67.8	"	LIGHT
1255	52.0	6.60	800	67.9	"	"
1300	65.0	6.60	7.99	67.7	"	"

D. O. (ppm): NR ODOR: ND

	(COBALT 0 - 100)	(NTU 0 - 200)
	NR	NR

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Fine LOCK #: 3259

REMARKS: All Samples taken

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-1

Signature: JButera Reviewed By: MK Page 2 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-17.01 | SAMPLE ID: MW-3(31)

PURGED BY: J BUTERA | CLIENT NAME: ARCO 2035

SAMPLED BY: J BUTERA | LOCATION: Albany CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	15.0
DEPTH TO WATER (feet):	9.00	CALCULATED PURGE (gal.):	75.0
DEPTH OF WELL (feet):	31.9	ACTUAL PURGE VOL. (gal.):	47.0

DATE PURGED: 3.19.92 Start (2400 Hr) 1335 End (2400 Hr) 1420

DATE SAMPLED: 3.19.92 Start (2400 Hr) 1430 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1342	15.0	6.63	928	63.7	CLOUDY	MOD
1349	30.0	6.62	923	63.3	"	"
1405	45.0	6.71	846	64.2	BROWN	MOD/HVY
—	well dried at 47.0 gallons					
1430	Recharge	6.77	843	66.0	BROWN	MOD

D. O. (ppm): NR ODOR: ND

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	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Fair LOCK #: 3859

REMARKS: well dried at 47.0 gallons waited 20 minutes for recharge and took all samples.

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-4

Signature: J Butera Reviewed By: MK Page 3 of 4

EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 670-17.01 SAMPLE ID: RW-1

PURGED BY: NA CLIENT NAME: ARCO 2035

SAMPLED BY: NA LOCATION: Albany CA

TYPE: Ground Water X Surface Water ____ Treatment Effluent ____ Other ____

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

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

DEPTH TO WATER (feet): 8.90 CALCULATED PURGE (gal.): *

DEPTH OF WELL (feet): 28.7 ACTUAL PURGE VOL. (gal.): ____

DATE PURGED: NA Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
*	Product in well No sample					

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

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

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- ____ Bailer (Teflon®)
- ____ Centrifugal Pump
- ____ Bailer (PVC)
- ____ Submersible Pump
- ____ Bailer (Stainless Steel)
- ____ Well Wizard™
- ____ Dedicated

Other: NA

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ Bailer (Teflon®)
- ____ DDL Sampler
- ____ Bailer (Stainless Steel)
- ____ Dipper
- ____ Submersible Pump
- ____ Well Wizard™
- ____ Dedicated

Other: NA

WELL INTEGRITY: ~~No~~ No well cap LOCK #: NA

REMARKS: Product in well No sample. Duct tape covered well.

0.5 ft of product 3-19-92

Meter Calibration: Date: ____ Time: ____ Meter Serial #: ____ Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: ____

Signature: J Butera Reviewed By: MK Page 4 of 4

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date February 25,.1992
Project G70-17.01

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

We are enclosing:

Copies	Description
1	Depth To Water/Floating Product Survey Form, February 1992 monthly water level survey, ARCO station 2035, 1001 San Pablo Avenue, Albany, CA

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: Mark Knuttel MK

6/30/92

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-17.01 STATION ADDRESS : 1001 San Pablo Ave. Albany, CA DATE : 2-19-92

ARCO STATION # : 2035 FIELD TECHNICIAN : Vince Barlock 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	TORN	YES	YES	8.66	8.65	ND	ND	29.57	—
2	MW-2	OK	YES	GOOD	YES	YES	8.70	8.70	ND	ND	28.74	—
3	MW-3	OK	YES	GOOD	YES	Broken	9.52	9.51	ND	ND	25.75	—
4	RW-1	OK	YES	DIRTY	YES	YES	10.20	10.20	8.06	2.14	25.64	Locking well cap to big for casing. NEEDS NEW ONE

Excellence Through Commitment

1971 20 YRS 1991

EMCON ASSOCIATES

Consultants in Wastes Management and Environmental Control

Date January 29, 1992

Project G70-17.01

To:

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

We are enclosing:

Copies	Description
1	DTW/FP Survey Form, January 1992 monthly water level survey, ARCO station 2035, 1001 San Pablo Avenue, Albany, CA

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:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4094 Exp. 6/30/92 INDUSTRIAL STATE OF CALIFORNIA

Mark Knuttel MK

Robert Porter, Senior P.E. #4094

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-17.01 STATION ADDRESS : 1001 San Pablo Ave. Albany, CA DATE : 1-19-92

ARCO STATION # : 2035 FIELD TECHNICIAN : J Williams DAY : Sunday

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	yes	✓	10.06	10.06	NA	NA	29.55	—
2	MW-2					✓	10:44	10.44	NA	NA	28.72	—
3	MW-3					✓	10.56	10.56	NA	NA	25.74	—
4	RW-1					✓	12.83	12.83	9.57	3.26	25.60	—

1018-2
GIB-92-025

MONITORING WELL PURGE WATER DISPOSAL FO[illegible]M

TO BE COMPLETED BY GENERATOR

NAME ARCO PRODUCTS

ADDRESS P.O. BOX 5811

CITY, STATE, ZIP SAN MATEO, CA 94402 PHONE NO (415)571-2434

Description of Water: Purge water generated during sampling or development of monitoring wells located at various ARCO sites. Auger rinsate generated during the installation of monitoring wells at various ARCO sites. The water may contain dissolved hydrocarbons.

	STA #	ADDRESS	GAL
1.	# 524	789 REDWOOD HWY., MILL VALLEY, CALIFORNIA	328
2.	2035	1001 SAN PABLO AVE., ALBANY, CALIFORNIA	161
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

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

KYLE CHRISTIE Kyle Christie by Jon DeLon 3/30/92
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TRANSPORTER

NAME ALLIED OIL & PUMPING /BALCH PETROLEUM

ADDRESS P.O. BOX 32128

CITY, STATE, ZIP SAN JOSE, CA

PHONE NO (408)432-0333

TRUCK UNIT I.D. NO

ED TAYLOR Ed Taylor 3-30-92
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TSD FACILITY

NAME GIBSON OIL & REFINING

ADDRESS 475 SEAPORT BLVD XX RECYCLE ☐ OTHER

CITY, STATE, ZIP REDWOOD CITY, CA 94063

PHONE NO (415)368-5511 RELEASE#11320

GAL

Bill Lord Bill Lord 3-30-92
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

(Continued)