RESNA
Working To Restore Nature

3315 Almaden Expressway, Suite 34
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TRANSMITTAL

DATE: May 5, 1993
PROJECT NO.: 60006.06

TO: Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

ATTENTION: Ms. Eva Chu

SUBJECT: ARCO Station No. 6041

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	4/29/93	First Quarter 1993 Groundwater Monitoring Report for ARCO Station No. 6041, 7249 Village Parkway, Dublin, California.

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment [ ] As requested [√] For your files [ ] For approval

REMARKS:

James L. Nelson, C.E.G. 1463

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3315 Almaden Expressway, Suite 34
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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
First Quarter 1993
at
ARCO Station 6041
7249 Village Parkway
Dublin, California

60006.06

RESNA
Working To Restore Nature

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April 29, 1993
0408MWHE
60006.06

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

Subject: First Quarter 1993 Groundwater Monitoring Report for ARCO Station 6041, 7249 Village Parkway, Dublin, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) has prepared this letter report which summarizes the results of first quarter 1993 groundwater monitoring performed by ARCO's contractor, 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 previously detected at the site. The field work and laboratory analyses of groundwater samples during this quarter were performed under the direction of EMCON and included measuring depth-to-water (DTW) levels, subjectively analyzing groundwater for the presence of petroleum product, collecting groundwater samples from 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 direction of EMCON; evaluation and warrant of their field data and field protocols is beyond 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 flow direction beneath the site.

The operating ARCO Station 6041 is located at the northern corner of the intersection of Village Parkway and Amador Valley Boulevard in a commercial and residential area at 7249 Village Parkway, in Dublin, California. The site location is shown on the Site Vicinity Map, Plate 1.

Results of previous environmental investigations at the site are summarized in the reports listed in the References section. The location of the groundwater monitoring wells, borings, and pertinent site features are shown on the Generalized Site Plan, Plate 2.

Groundwater Sampling and Gradient Evaluation

DTW levels were measured in groundwater monitoring wells MW-1 through MW-6 by EMCON field personnel on January 15, February 10, and March 29, 1993. At the request of Mr. Scott Seery of Alameda County Health Care Services Agency (ACHCSA) the February monitoring of the wells at the ARCO site was coordinated with monitoring by other consultants of the wells at three other sites located at the intersection of Village Parkway and Amador Boulevard (BP, former Shell, and Unocal Stations) to obtain more complete data for gradient evaluation. Quarterly sampling was performed by EMCON field personnel on February 10, 1992. The results of EMCON's field work on the site, including DTW levels and subjective analyses for the presence of product in the groundwater in onsite wells are presented on EMCON's Field Reports, 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 from wells at the subject site for this and previous quarters are summarized in Table 1, Cumulative Groundwater Monitoring Data. DTW levels, wellhead elevations and groundwater elevations for groundwater monitoring wells at BP, former Shell, and Unocal Stations are reported in Table 2, Groundwater Monitoring Data - BP, Former Shell, and Unocal Stations. Evidence of product or sheen was not observed during this quarter in any of the wells at the ARCO site (see EMCON's Field Reports, Appendix A). The average groundwater gradient, interpreted from EMCON's DTW levels for January, February, and March 1993, was generally less than 0.01 ft/ft. The flow direction fluctuated from the east-southeast in January and February, to southeast in March. DTW measurements obtained on February 10, 1993, from wells located at BP, former Shell, and Unocal Stations were used to evaluate the gradient in the vicinity of ARCO Station 6041. The average gradient in the vicinity of ARCO Station on February 10, 1993, was approximately 0.01 ft/ft toward east-southeast. This interpreted gradient is generally consistent with regional gradient direction. Plates 3 through 6, Groundwater Gradient Maps, are graphic interpretations of the groundwater elevations measured on January 15, February 10, and March 29, 1993. Plates 3 through 5 depict the groundwater gradient at the ARCO site, and Plate 6 depicts the groundwater gradient in the vicinity of the ARCO site.

Groundwater monitoring wells MW-1 through MW-6 were purged and sampled by EMCON field personnel on February 10, 1993. EMCON's water sample field data sheets are included in Appendix A. Purge water generated during purging and sampling of the monitoring wells was transported to Gibson Environmental in Redwood City, California for recycling.

Laboratory Methods and Analyses

Water samples collected from the wells MW-1 through MW-6 were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification No. 1426), and analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8020/California DHS LUFT Methods. Concentrations of TPHg and benzene in the groundwater are shown on Plate 7, TPHg Concentrations in Groundwater; and Plate 8, Benzene Concentrations in Groundwater. The Chain of Custody Records and Laboratory Analyses Reports are included in Appendix A. Groundwater analytical results from this and previous quarters are summarized in Table 3, Cumulative Results of Laboratory Analyses of Groundwater Samples.

Since the last quarter, concentrations of TPHg and BTEX remained nondetectable in wells MW-4 through MW-6, decreased in MW-3, and increased in MW-1 and MW-2.

Conclusions

Groundwater in the shallow aquifer beneath the southern and southwestern portions of the site has been impacted by gasoline hydrocarbons. The lateral extent of gasoline hydrocarbons in the groundwater appears to have been delineated to less than 50 ppb of TPHg beneath the northwestern, northern and northeastern portions of the site, downgradient and crossgradient of the existing tanks and service islands. Based on our limited review of groundwater monitoring data from sites situated adjacent to and across from the ARCO site (Unocal, BP, and former Shell) it appears that the local groundwater has been impacted by gasoline sources from several sites situated upgradient and crossgradient of the ARCO site. Therefore, it appears that other responsible parties in the vicinity and upgradient of the ARCO site should be responsible for evaluating the presence of gasoline hydrocarbons offsite.

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

Ms. Eva Chu
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

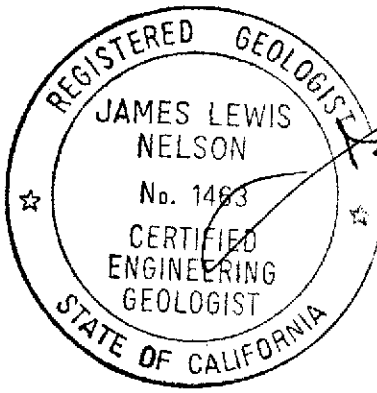
Mr. Richard Hiett
California Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

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

Sincerely,
RESNA Industries Inc.

Barbara Sieminski

Barbara Sieminski
Assistant Project Geologist



James L. Nelson
Certified Engineering
Geologist 1463

Enclosures: References

Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Groundwater Gradient Map, January 15, 1993
Plate 4, Groundwater Gradient Map, February 10, 1993
Plate 5, Groundwater Gradient Map, March 29, 1993
Plate 6, Areal Groundwater Gradient Map, February 10, 1993
Plate 7, TPHg Concentrations in Groundwater, February 10, 1993
Plate 8, Benzene Concentrations in Groundwater, February 10, 1993

Table 1, Cumulative Groundwater Monitoring Data
Table 2, Cumulative Groundwater Monitoring Data; BP, Former Shell, and Unocal Stations
Table 3, Cumulative Results of Laboratory Analyses of Groundwater Samples

Appendix A: EMCON's Field Reports, Summary of Groundwater Monitoring Data, Certified Analytical Reports with Chain of Custody, Water Sample Field Data Sheets

REFERENCES

Alameda County Flood Control and Water Conservation District, Zone 7. January 16, 1991. Fall 1990 groundwater Level Report.

Applied GeoSystems. September 19, 1990. Letter Report Limited Environmental Investigation Related to the Removal of Waste-Oil Tank at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006-1.

California Department of Water Resources, 1974. Evaluation of Ground-Water Resources Engineering Livermore and Sunol Valleys; Bulletin No. 118-2, Appendix A.

Department of Health Services, State of California. October 24, 1990. Summary of California Drinking Water Standards.

RESNA. August 22, 1991. Work Plan for Subsurface Investigation and Remediation at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.02.

RESNA. August 22, 1991. Addendum One to Work Plan for Subsurface Investigation and Remediation at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.02.

RESNA. August 30, 1991. Site Safety Plan. 60006.02S.

RESNA. February 12, 1992. Subsurface Environmental Investigation at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.02

RESNA. March 7, 1992. Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

RESNA. May 1, 1992. Letter Report, Quarterly Groundwater Monitoring, First Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

RESNA. September 25, 1992. Letter Report, Quarterly Groundwater Monitoring, Second Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

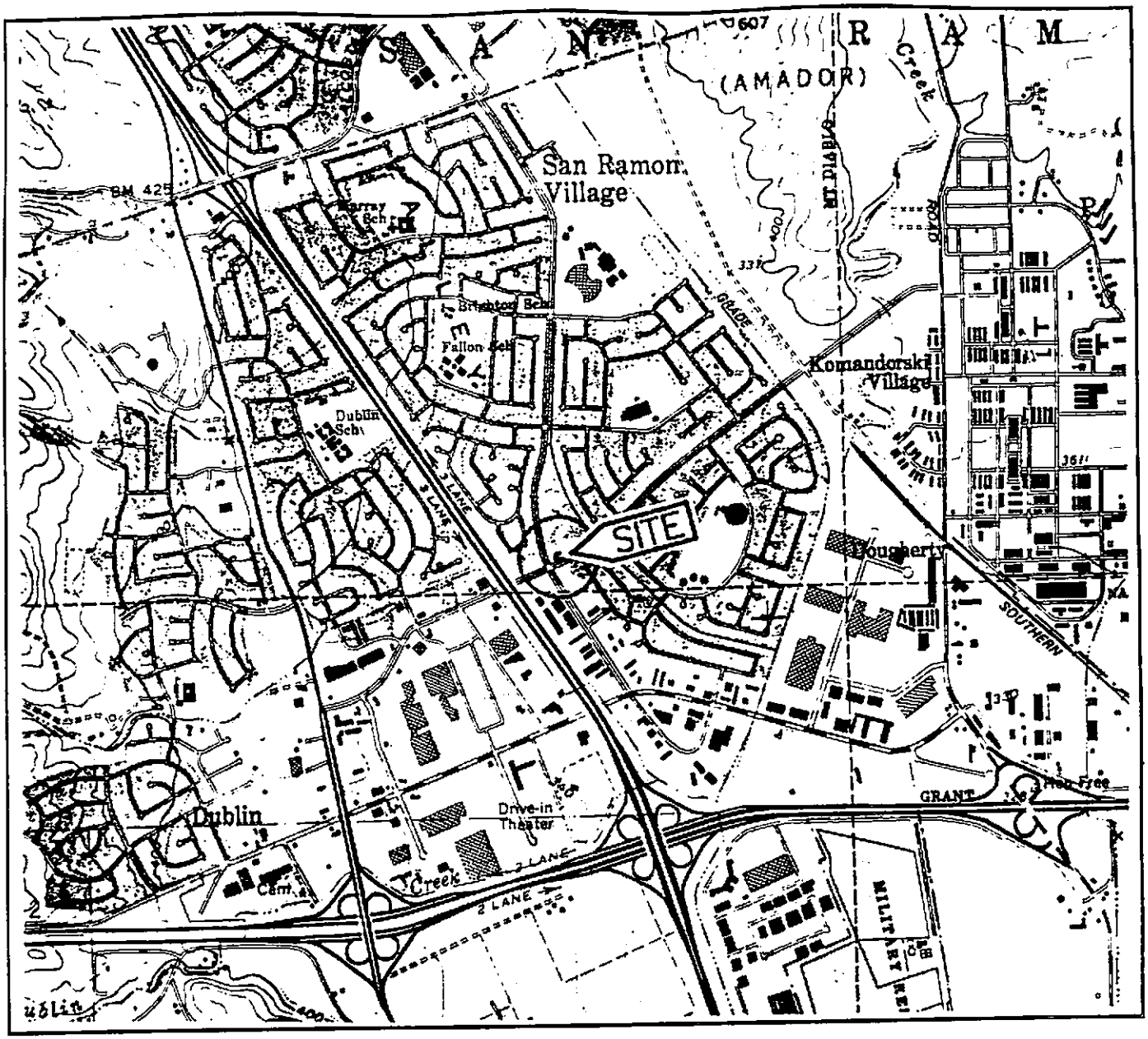
REFERENCES

RESNA. September 29, 1992. Work Plan for Initial Offsite and Additional Onsite Subsurface Investigations at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.04

RESNA. December 29, 1992. Letter Report, Quarterly Groundwater Monitoring, Third Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.03

RESNA. January 29, 1993. Additional Onsite Subsurface Investigation and Vapor Extraction Test at ARCO Station 6041, 7249 Village Parkway, Dublin, California. 60006.04

RESNA. March 31, 1993. Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1992 at ARCO Station, 6041, 7249 Village Parkway, Dublin, California. 60006.05



Base: U.S. Geological Survey
7.5-Minute Quadrangles
Dublin, California
Photorevised 1980

N

LEGEND

= Site Location

Approximate Scale

2000 1000 0 2000 4000

feet

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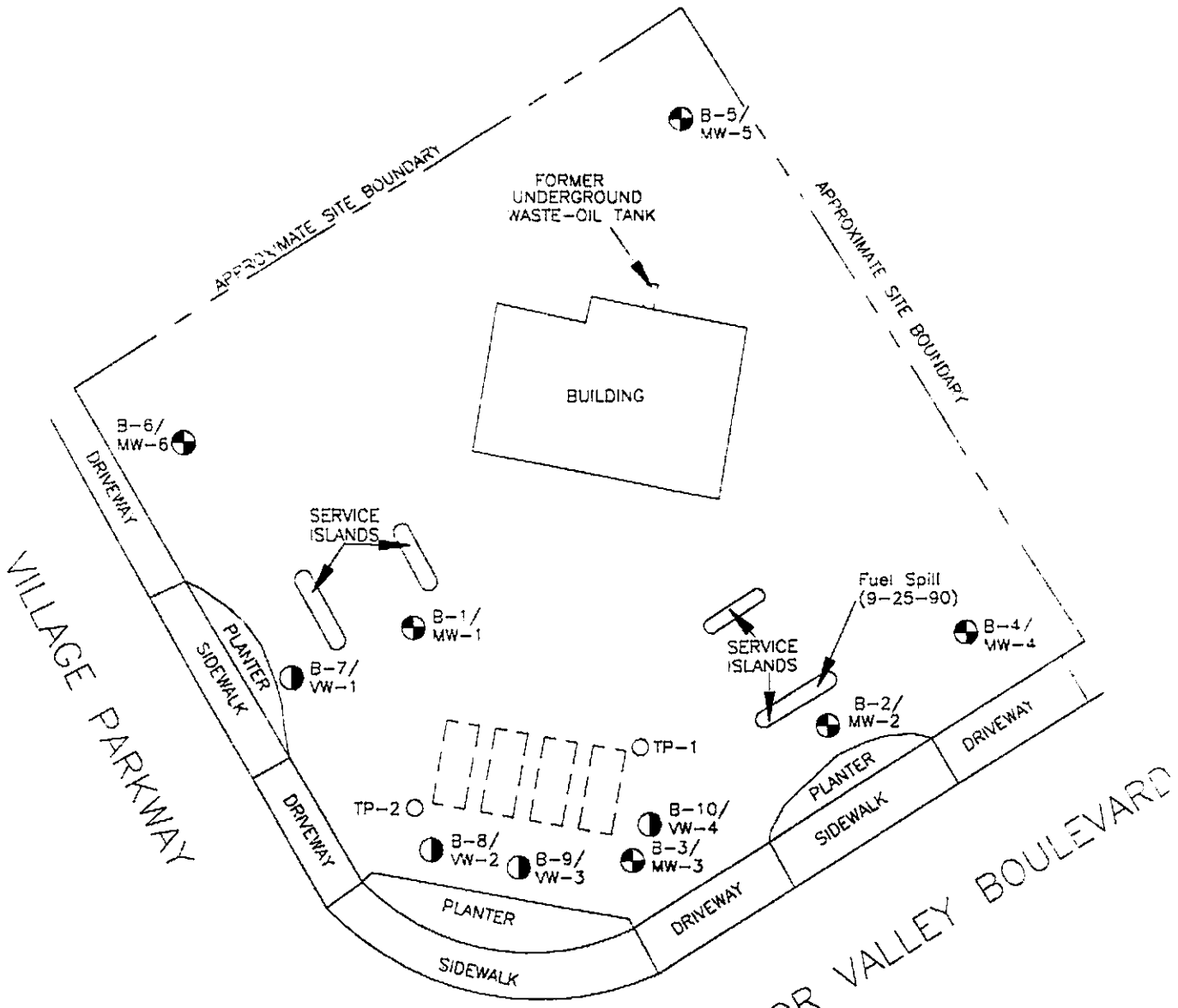
SITE VICINITY MAP
ARCO Station 6041
365 Jackson Street
Dublin, California

PLATE
1

60006-6



EXPLANATION

B-6/ MW-6 = Boring/groundwater monitoring well (RESNA, September 1991 and October 1992)

B-10/ VW-4 = Boring/vapor extraction well (RESNA, October 1992)

TP-2 = Tank pit observation well

= Underground storage tanks

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

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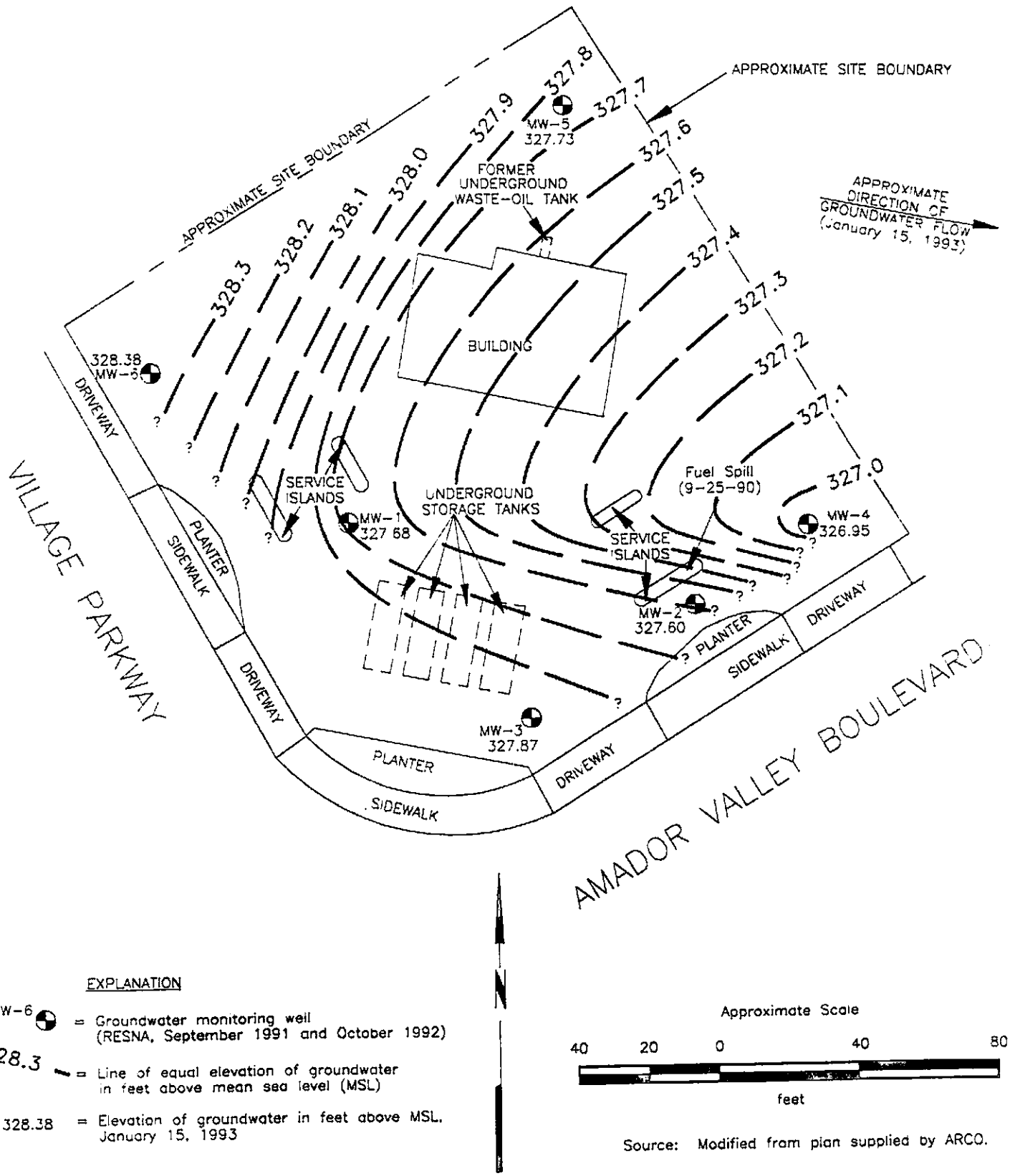
GENERALIZED SITE PLAN
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
2

60006GP1



EXPLANATION

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

328.3 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

328.38 = Elevation of groundwater in feet above MSL, January 15, 1993

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

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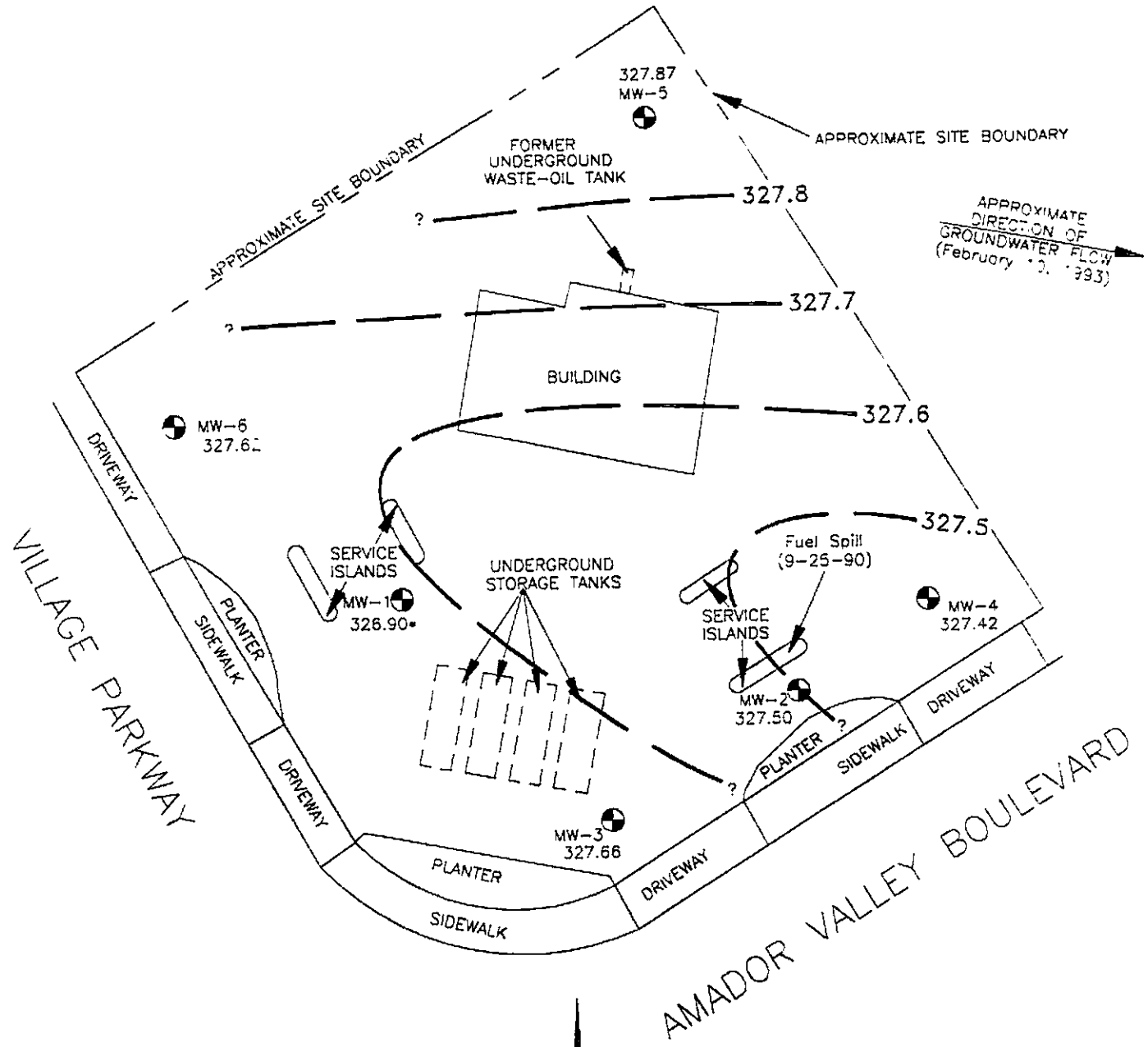
GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 3



MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

327.8 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

327.87 = Elevation of groundwater in feet above MSL, February 10, 1993

* = Not used for gradient evaluation due to anomalous water level reading

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

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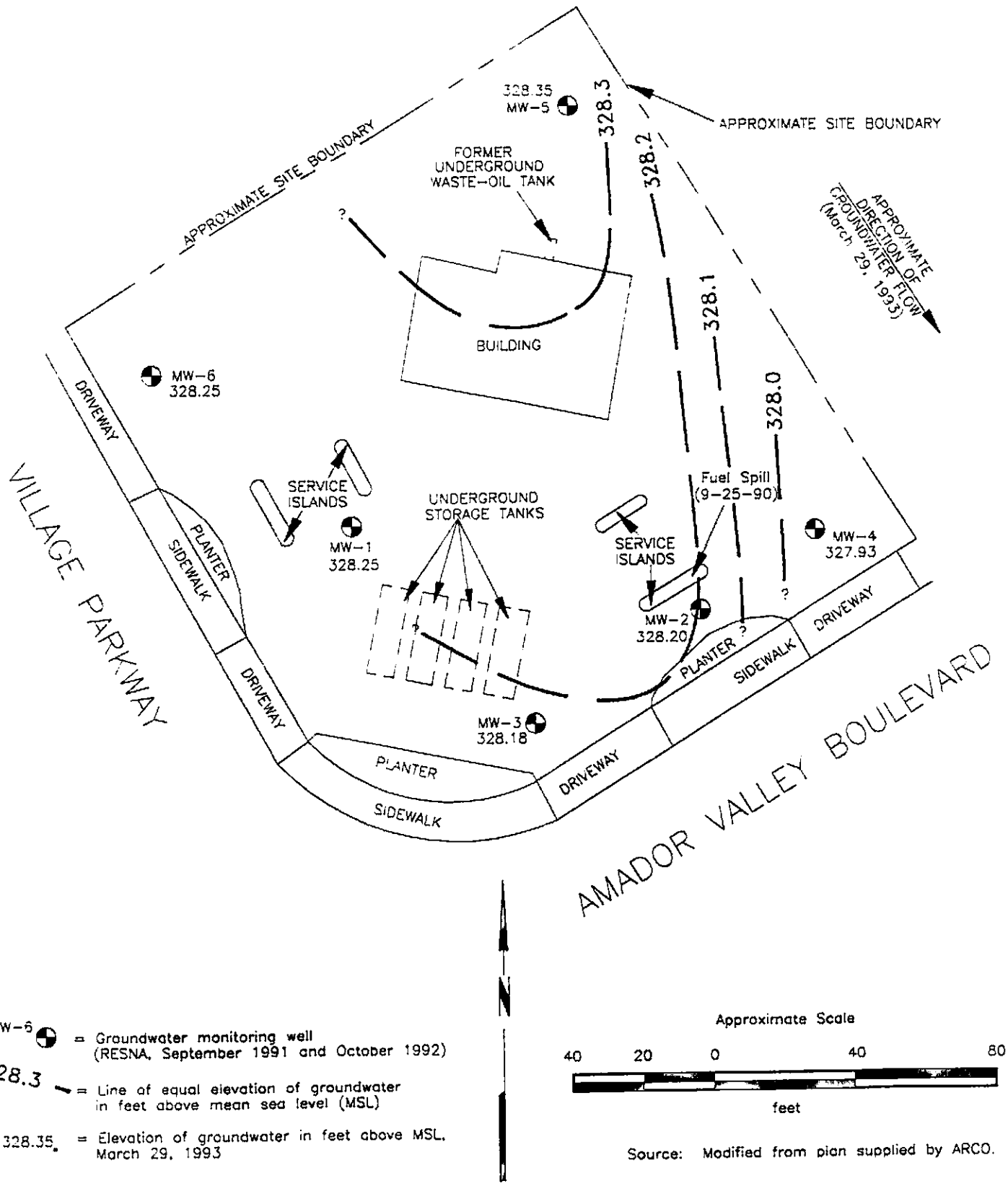
GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 4

600066P31



MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

328.3 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

328.35 = Elevation of groundwater in feet above MSL, March 29, 1993

Source: Modified from plan supplied by ARCO.

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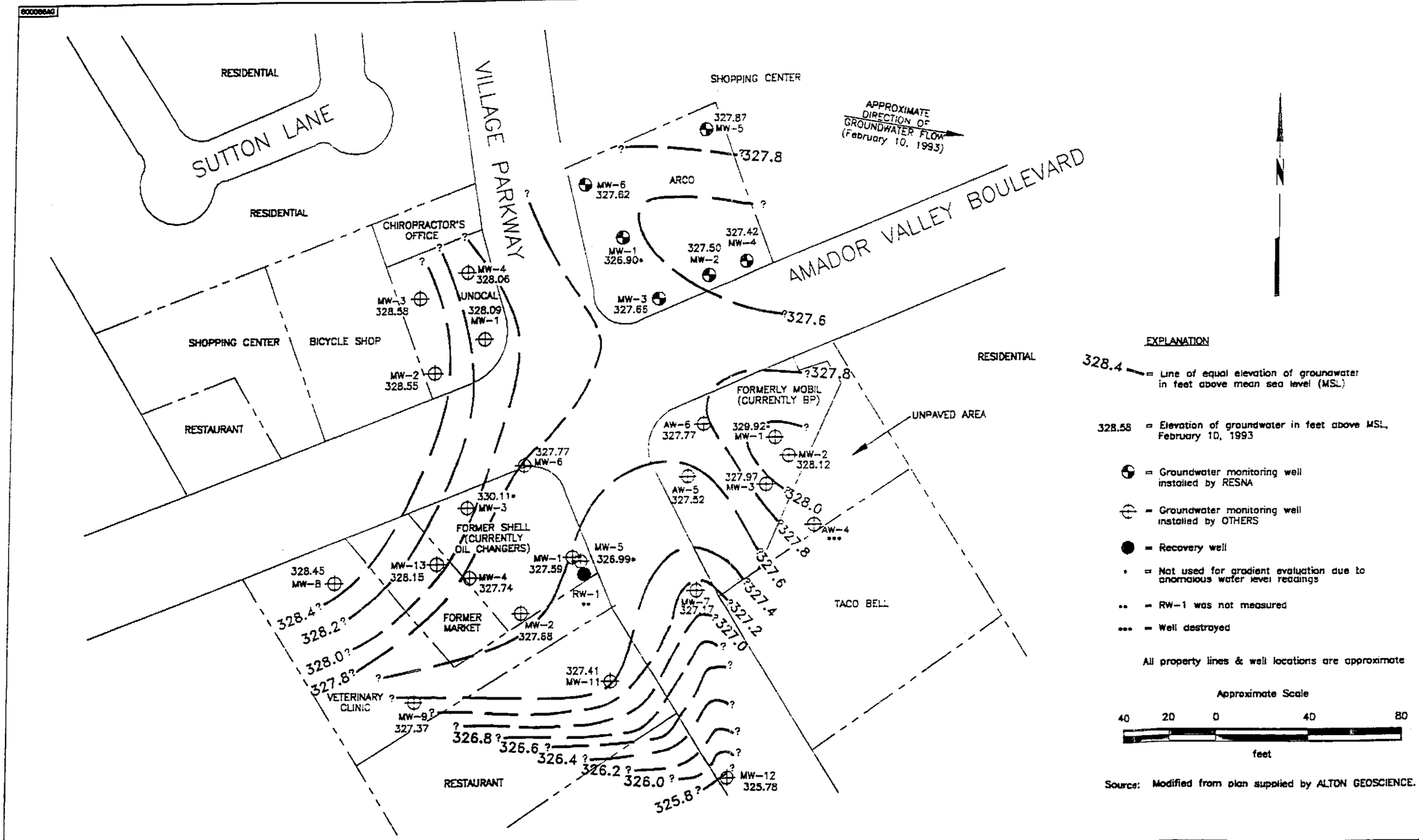
GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
5



EXPLANATION

328.4 = Line of equal elevation of groundwater in feet above mean sea level (MSL)

328.58 = Elevation of groundwater in feet above MSL, February 10, 1993

= Groundwater monitoring well installed by RESNA

= Groundwater monitoring well installed by OTHERS

= Recovery well

* = Not used for gradient evaluation due to anomalous water level readings

** = RW-1 was not measured

*** = Well destroyed

All property lines & well locations are approximate

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ALTON GEOSCIENCE.

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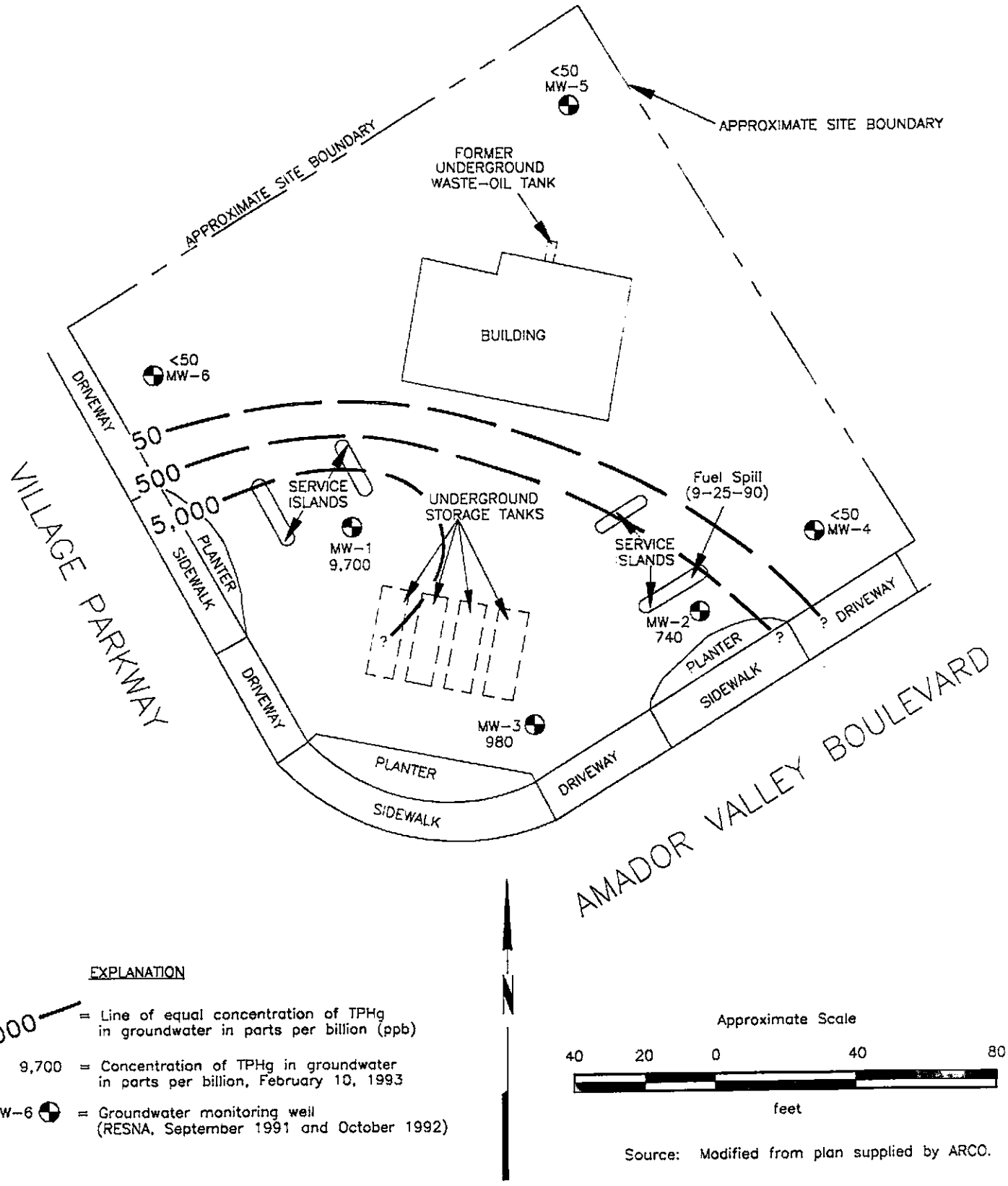
AREAL GROUNDWATER GRADIENT MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE
6

60006GT2



EXPLANATION

5,000 = Line of equal concentration of TPHg in groundwater in parts per billion (ppb)

9,700 = Concentration of TPHg in groundwater in parts per billion, February 10, 1993

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

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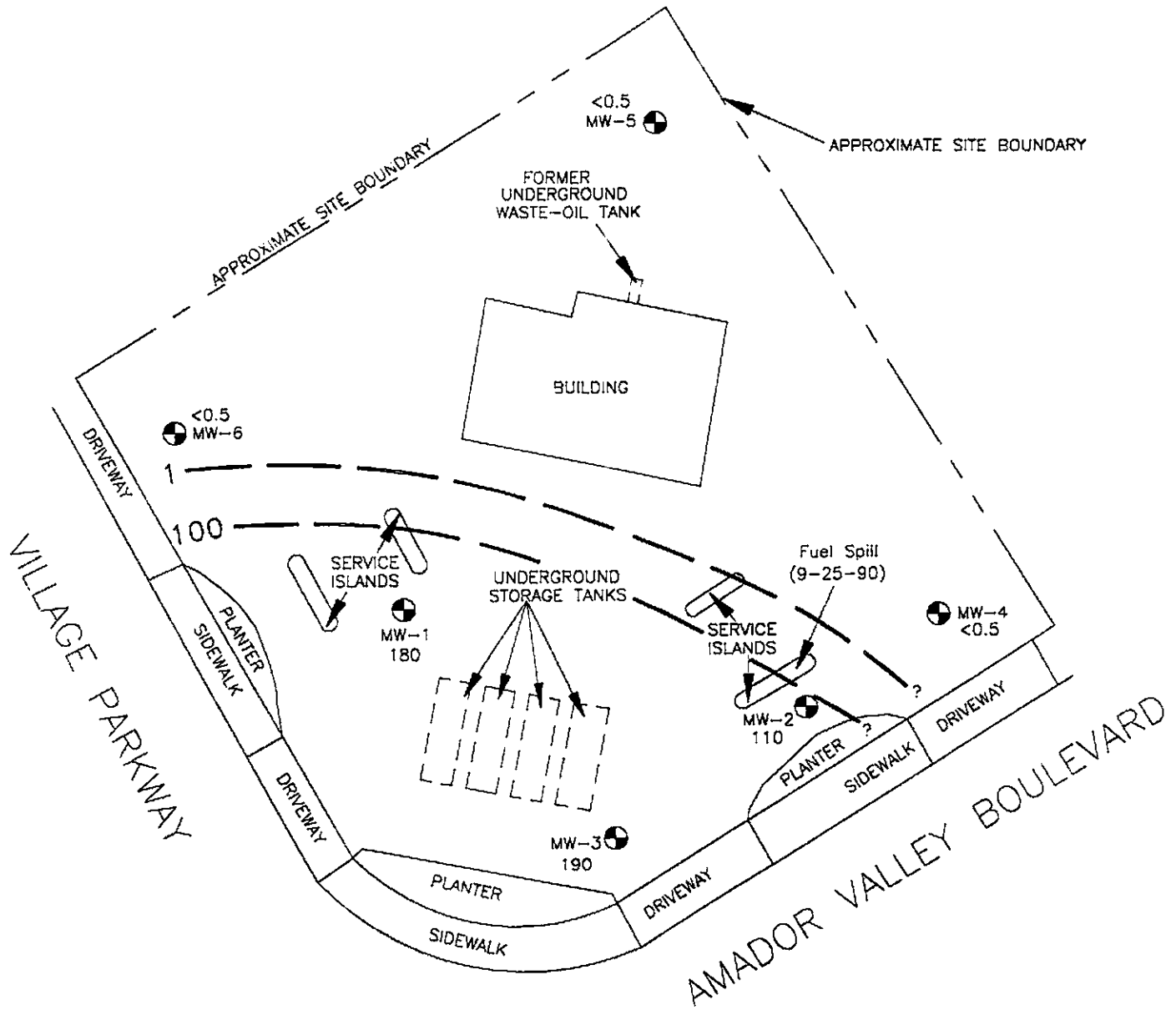
TPHg CONCENTRATIONS IN GROUNDWATER
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 7

60006682



EXPLANATION

100 = Line of equal concentration of benzene in groundwater in parts per billion (ppb)

190 = Concentration of benzene in groundwater in parts per billion, February 10, 1993

MW-6 = Groundwater monitoring well (RESNA, September 1991 and October 1992)

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

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BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 8

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Quarterly Groundwater Monitoring
ARCO Station 6041, Dublin, CA

April 29, 1993
60006.06

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6041
Dublin, California
(Page 1 of 2)

Date Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1				
09-20-91	336.56	11.20	325.36	None
10-22-91		11.48	325.08	None
11-27-91		11.27	325.29	None
12-16-91		11.55	325.01	None
01-18-92		11.37	325.19	None
02-21-92		9.13	327.43	None
03-16-92		9.70	326.86	None
04-24-92		10.20	326.36	None
05-15-92		10.46	326.10	None
06-09-92		10.73	325.83	None
07-28-92		11.04	325.52	None
08-24-92		11.32	325.24	None
09-09-92		11.54	325.02	None
10-26-92		11.80	324.76	None
11-10-92		11.74	324.84	None
12-14-92		10.77	325.79	None
01-15-93		8.88	327.68	None
02-10-93		9.66	326.90	None
03-29-93		8.31	328.25	None
MW-2				
09-20-91	334.80	9.22	325.58	None
10-22-91		9.66	325.14	None
11-27-91		9.48	325.32	None
12-16-91		9.76	325.04	None
01-18-92		9.47	325.33	None
02-21-92		7.62	327.18	None
03-16-92		7.84	326.96	None
04-24-92		8.34	326.46	None
05-15-92		8.62	326.18	None
06-09-92		8.88	325.92	None
07-28-92		9.38	325.42	None
08-24-92		9.81	324.99	None
09-09-92		9.92	324.88	None
10-26-92		10.13	324.67	None
11-10-92		10.12	324.68	None
12-14-92		8.99	325.81	None
01-15-93		7.20	327.60	None
02-10-93		7.30	327.50	None
03-29-93		6.60	328.20	None

See notes on Page 2 of 2

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Quarterly Groundwater Monitoring
ARCO Station 6041, Dublin, CA

April 29, 1993
60006.06

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6041
Dublin, California
(Page 2 of 2)

Date Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-3				
09-20-91	335.53	10.16	325.37	None
10-22-91		10.48	325.05	None
11-27-91		10.17	325.36	None
12-16-91		10.25	325.28	None
01-18-92		10.71	324.82	None
02-21-92		8.68	326.85	None
03-16-92		8.91	326.62	None
04-24-92		9.14	326.39	None
05-15-92		9.54	325.99	None
06-09-92		9.72	325.81	None
07-28-92		10.15	325.38	None
08-24-92		10.42	325.11	None
09-09-92		10.53	325.00	None
10-26-92		10.92	324.61	None
11-10-92		10.72	324.81	None
12-14-92		9.78	325.75	None
01-15-93		7.66	327.87	None
02-10-93		7.87	327.66	None
03-29-93		7.35	328.18	None
MW-4				
11-10-92	334.22	9.58	324.64	None
12-14-92		8.72	325.50	None
01-15-93		7.27	326.95	None
02-10-93		6.80	327.42	None
03-29-93		6.29	327.93	None
MW-5				
11-10-92	335.87	11.02	324.85	None
12-14-92		10.17	325.70	None
01-15-93		8.14	327.73	None
02-10-93		8.00	327.87	None
03-29-93		7.52	328.35	None
MW-6				
11-10-92	335.84	11.03	324.81	None
12-14-92		10.03	325.81	None
01-15-93		7.64	328.20	None
02-10-93		8.22	327.62	None
03-29-93		7.59	328.25	None

Measurements in feet.
Wells MW-1 through MW-3 surveyed on October 11, 1991. Wells MW-4 through MW-6 surveyed on November 12, 1992. Datum is City of Dublin = (USGS)

TABLE 2
CUMULATIVE GROUNDWATER MONITORING DATA
BP Station 11116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Boulevard,
and Unocal Station, 7375 Amador Valley Boulevard,
Dublin, California
(Page 1 of 3)

Date Measured	Well Elevation	Depth-to -Water	Water Elevation
BP Station 1116			
MW-1			
11-10-92	335.17	10.67	324.50
02-10-93		5.25	329.92
MW-2			
11-10-92	334.58	10.27	324.31
02-10-93		6.46	328.12
MW-3			
11-10-92	335.13	10.78	324.35
02-10-93		7.16	327.97
AW-4			
11-10-92	333.41	9.10	324.31
02-10-93		Well destroyed	
AW-5			
11-10-92	334.81	10.27	324.54
02-10-93		7.29	327.52
AW-6			
11-10-92	334.90	10.10	324.80
02-10-93		7.13	327.77
Former Shell Station			
MW-1			
11-10-92	334.83	10.04	324.79
02-10-93		7.24	327.59
MW-2			
11-10-92	336.96	12.05	324.91
02-10-93		9.28	327.68
MW-3			
11-10-92	338.93	11.84	327.09
02-10-93		8.82	330.11

See Notes on Page 3 of 3.

TABLE 2
GROUNDWATER MONITORING DATA
BP Station 11116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Boulevard,
and UNOCAL Station, 7375 Amador Valley Boulevard,
Dublin, California
(Page 2 of 3)

Date Measured	Well Elevation	Depth-to -Water	Water Elevation
Former Shell Station cont.			
MW-4			
11-10-92	337.14	12.12	325.02
02-10-93		9.40	327.74
MW-5			
11-10-92	334.96	9.65	325.31
02-10-93		7.97	326.99
MW-6			
11-10-92	335.42	10.56	324.86
02-10-93		7.65	327.77
MW-7			
11-10-92	333.23	8.82	324.41
02-10-93		6.06	327.17
MW-8			
11-10-92	335.80	10.41	325.39
02-10-93		7.35	328.45
MW-9			
11-10-92	334.57	9.61	324.96
02-10-93		7.20	327.37
MW-11			
11-10-92	334.20	9.47	324.73
02-10-93		6.79	327.41
MW-12			
11-10-92	332.53	8.32	324.31
02-10-93		6.75	325.78

See Notes on Page 3 of 3.

Quarterly Groundwater Monitoring
ARCO Station 6041, Dublin, CA

April 29, 1993
60006.06

TABLE 2
GROUNDWATER MONITORING DATA
BP Station 11116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Boulevard,
and UNOCAL Station, 7375 Amador Valley Boulevard,
Dublin, California
(Page 3 of 3)

Date Measured	Well Elevation	Depth-to -Water	Water Elevation
Former Shell Station cont.			
MW-13			
11-10-92	335.64	10.69	324.95
02-10-93		7.49	328.15
UNOCAL Station			
MW-1			
11-10-92	336.72	11.97	324.75
02-10-93		8.63	328.09
MW-2			
11-10-92	337.36	12.15	325.21
02-10-93		8.81	328.55
MW-3			
11-10-92	337.53	12.33	325.20
02-10-93		8.95	328.58
MW-4			
11-10-92	337.00	12.32	324.68
02-10-93		8.94	328.06

Measurements in feet.
Depth-to-water and wellhead elevation data obtained from Alisto Engineering Group.
Datum is City of Dublin = (USGS)

Quarterly Groundwater Monitoring
ARCO Station 6041, Dublin, CA

April 29, 1993
60006.06

TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUNDWATER SAMPLES
ARCO Station 6041
Dublin, California

Well Date	TPHg	Benzene	Toluene	Ethyl- Benzene	Total Xylenes
MW-1					
09-20-91	410	28	36	4.3	89
12-16-91	840	50	50	3.9	12
03-16-92	780	22	12	45	22
06-09-92	700	8.8	15	16	18
09-09-92	400	5.4	8.4	4.6	6.7
11-10-92	2,800	93	56	190	390
02-10-93	9,700	180	100	450	740
MW-2					
09-20-91	130	6.6	0.96	1.4	1.5
12-16-91	83	0.96	<0.30	<0.30	<0.30
03-16-92	430	130	<2.5*	37	5.0
06-09-92	120	3.7	<0.5	5.7	<0.5
09-09-92	<50	<0.5	<0.5	<0.5	<0.5
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	740	110	<5*	35	<5*
MW-3					
09-20-91	990	50	100	11	200
12-16-91	1,000	180	5.1	23	4.3
03-16-92	430	86	<1.0*	22	3.4
06-09-92	1,800	290	2.4	49	17
09-09-92	2,600	550	<5*	120	12
11-10-92	1,100	280	<5*	100	<5*
02-10-93	980	190	<5*	52	<5*
MW-4					
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5					
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-6					
11-10-92	<50	<0.5	<0.5	<0.5	<0.5
02-10-93	<50	<0.5	<0.5	<0.5	<0.5
MCL	—	1	—	680	1,750
DWAL	—	—	100	—	—

Results in parts per billion (ppb)
Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 5030/8020/DHS LUFT Methods.
TPHg: Total petroleum hydrocarbons as gasoline (analyzed by EPA Method 5030/8020/DHS LUFT Methods).
MCL: Maximum contaminant level in drinking water (DHS, October 1990)
DWAL: Department of Health Services Recommended Drinking Water Action Level (DHS, October 1990).
*: Raised method reporting limit due to high analyte concentration requiring sample dilution, as reported by Columbia Analytical Services, Inc.

APPENDIX A

EMCON'S FIELD REPORTS, SUMMARY OF GROUNDWATER MONITORING DATA, CERTIFIED ANALYTICAL REPORTS WITH CHAIN OF CUSTODY, WATER SAMPLE FIELD DATA SHEETS

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

Mail

Date March 4, 1993
Project 0G70-035.01

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 Results
1	Summary of Groundwater Monitoring Data
1	Certified Analytical Reports with Chain-of-Custody
6	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:
Enclosed are the data from the first quarter 1993 monitoring event at ARCO service station 6041, 7249 Village Parkway, Dublin, 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

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No. 4034 EXP 4/30/94 INDUSTRIAL STATE OF CALIFORNIA

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-035.01 STATION ADDRESS : 7249 Village Parkway, Dublin, CA DATE : 2-10-93

ARCO STATION # : 6041 FIELD TECHNICIAN : M Gallegos 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-4	Good	Yes	good	3259	Good	6.80	6.80	ND	ND	145	—
2	MW-5	Good	Yes	Good	3259	Good	8.00	8.0	ND	ND	174	—
3	MW-6	Good	Yes	good	3259	good	8.22	8.22	ND	ND	158	water in Box
4	MW-2	Good	Yes	good	no Lock	Good	7.30	7.30	ND	ND	141?	needs new Lock + Lock. water in Box
5	MW-1	Good	Yes	good	3259	good	9.66	9.66	ND	ND	175	—
6	MW-3	Good	Yes	good	3259	good	7.97	7.87	ND	ND	146	—

SURVEY POINTS ARE TOP OF WELL CASINGS

146

Summary of Groundwater Monitoring Data
First Quarter 1993
ARCO Service Station 6041
7249 Village Parkway, Dublin, 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(17)	02/10/93	9.66	ND.[2]	9,700.	180.	100.	450.	740.
MW-2(14)	02/10/93	7.30	ND.	740.	110.	<5.	35.	<5.
MW-3(14)	02/10/93	7.87	ND.	980.	190.	<5.	52.	5.
MW-4(14)	02/10/93	6.80	ND.	<50.	<0.5	<0.5	<0.5	<0.5
MW-5(17)	02/10/93	8.00	ND.	<50.	<0.5	<0.5	<0.5	<0.5
MW-6(15)	02/10/93	8.22	ND.	<50.	<0.5	<0.5	<0.5	<0.5
FB-1[3]	02/10/93	NA.[4]	NA.	<50	<0.5	<0.5	<0.5	<0.5

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. FB. = Field blank
4. NA. = Not applicable

Columbia Analytical Services, Inc.

February 26, 1993

Service Request No. SJ93-0188

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

Re: **EMCON Project No. 0G70-035.01**
ARCO Facility No. 6041

Dear Mr. Butera:

Attached are the results of the water samples submitted to our lab on February 10, 1993. For your reference, these analyses have been assigned our service request number SJ93-0188.

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/kt

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-035.01
ARCO Facility No. 6041

Date Received: 02/10/93
Service Request No.: SJ93-0188
Sample Matrix: Water

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

Sample Name:		MW-1 (17)	MW-2 (14)	MW-3 (14)
Date Analyzed:		02/23/93	02/24/93	02/24/93
Analyte	**MRL**			
Benzene	0.5	180.	110.	190.
Toluene	0.5	100.	<5. *	<5. *
Ethylbenzene	0.5	450.	35.	52.
Total Xylenes	0.5	740.	<5. *	5.
TPH as Gasoline	50	9,700.	740.	980.

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: Kevin Murphy Date: February 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	02/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0188
	ARCO Facility No. 6041	**Sample Matrix:**	Water

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

Sample Name:		MW-4 (14)	MW-5 (17)	MW-6 (15)
Date Analyzed:		02/22/93 *	02/22/93 *	02/22/93 *
Analyte	**MRL**			
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
* This sample was part of the analytical batch started on February 22, 1993. However, it was analyzed after midnight so the actual date analyzed is February 23, 1993.

Approved by: _____ Date: February 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	02/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0188
	ARCO Facility No. 6041	**Sample Matrix:**	Water

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

Sample Name:	FB-1	Method Blank	Method Blank
Date Analyzed:	02/22/93 *	02/22/93	02/23/93
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
* This sample was part of the analytical batch started on February 22, 1993. However, it was analyzed after midnight so the actual date analyzed is February 23, 1993.

Approved by: Kevin A Murphy Date: February 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	02/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0188
	ARCO Facility No. 6041	**Sample Matrix:**	Water

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

Sample Name:	**Method Blank**
Date Analyzed:	**02/24/93**

Analyte	MRL	
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	0.5	ND
TPH as Gasoline	50	ND

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

Approved by: Keenan Murphy Date: February 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-035.01
ARCO Facility No. 6041

Date Received: 02/10/93
Service Request No.: SJ93-0188

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

Date Analyzed: 02/22/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	253.	101.	85-115
Toluene	250.	284.	114.	85-115
Ethylbenzene	250.	284.	114.	85-115
Total Xylenes	750.	840.	112.	85-115
TPH as Gasoline	2,500.	2,467.	99.	90-110

Date Analyzed: 02/23/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	244.	97.	85-115
Toluene	250.	265.	106.	85-115
Ethylbenzene	250.	263.	105.	85-115
Total Xylenes	750.	789.	105.	85-115
TPH as Gasoline	2,500.	2,511.	100.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: Leon M Murphy Date: February 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-035.01
ARCO Facility No. 6041

Date Received: 02/10/93
Service Request No.: SJ93-0188

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

Date Analyzed: 02/24/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	250.	215.	86.	85-115
Toluene	250.	234.	94.	85-115
Ethylbenzene	250.	234.	94.	85-115
Total Xylenes	750.	689.	92.	85-115
TPH as Gasoline	2,500.	2,593.	104.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: Karen Murphy Date: February 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	02/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0188
	ARCO Facility No. 6041	**Sample Matrix:**	Water

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

Sample Name	Date Analyzed	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (17)	02/23/93	103.
MW-2 (14)	02/24/93	100.
MW-3 (14)	02/24/93	99.
MW-4 (14)	02/22/93	86.
MW-5 (17)	02/22/93	91.
MW-6 (15)	02/22/93	90.
FB-1	02/22/93	83.
MW-1 (17) MS	02/23/93	72.
MW-1 (17) DMS	02/23/93	100.
Method Blank	02/22/93	92.
Method Blank	02/23/93	95.
Method Blank	02/24/93	88.
	CAS Acceptance Criteria	70-130

TPH Total Petroleum Hydrocarbons

Approved by: Kevin Murphy Date: February 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	02/10/93
Project:	EMCON Project No. 0G70-035.01	**Service Request No.:**	SJ93-0188
	ARCO Facility No. 6041	**Sample Matrix:**	Water

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

Sample Name: MW-1 (17)
Date Analyzed: 02/23/93

			Spike Result		Percent Recovery		CAS Acceptance
Analyte	Spike Level	Sample Result	MS	DMS	MS	DMS	Criteria
Benzene	500.	181.	685.	708.	101.	105.	39-150
Toluene	500.	99.7	629.	663.	106.	113.	46-148
Ethylbenzene	500.	448.	1,030.	1,060.	116.	122.	32-160

Approved by: Kevin Murphy Date: February 26, 1993

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMCGC-92-1

Chain of Custody

ARCO Facility no. 6041	City (Facility) Dublin	Project manager (Consultant) JIM BUTERA	Laboratory name CAS
ARCO engineer Kyle Christie	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-0719	Fax no. (Consultant) 453-0452
Consultant name ERICON Associates	Address (Consultant) 1938 Junction Avenue San Jose		Contract number 07077

Method of shipment: Sampler will deliver

Sample I.D.	Lab no	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015 CAS	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 ☐ Sem VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
MW-1(17')	1-2	2		X		X	HCl	2-10-93	1414		X									
MW-2(14')	3-4	2		X		X			1312		X									
MW-3(14')	5-6	2		X		X			1350		X									
MW-4(14')	7-8	2		X		X			1131		X									
MW-5(17')	9-10	2		X		X			1205		X									
MW-6(15')	11-12	2		X		X			1244		X									
EB-1	13-14	2		X		X			1414		X									

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40 ml HCl VOA's

0670-035.01

Lab number 0188 SJ93-219

Turnaround time

- Priority Rush 1 Business Day [ ]
- Rush 2 Business Days [ ]
- Expedited 5 Business Days [ ]
- Standard 10 Business Days [X]

Condition of sample: OK

Temperature received: cool

	Date	Time	
Relinquished by sampler	2-10-93	1525	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory

Date: 2-10-93 Time: 15:30

White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-055.01 SAMPLE ID: MW-1

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6041

SAMPLED BY: M Gallegos LOCATION: Dublin, 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.): 5.12

DEPTH TO WATER (feet): 9.65 CALCULATED PURGE (gal.): 15.35

DEPTH OF WELL (feet): 17.5 ACTUAL PURGE VOL. (gal.): 50

DATE PURGED: 2-10-93 Start (2400 Hr) 1402 End (2400 Hr) 1405

DATE SAMPLED: 2-10-93 Start (2400 Hr) 1412 End (2400 Hr) 1414

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1405	50	7.49	3330	66.8	Clear	Heavy
1414	recharge	7.41	3290	67.3	"	"

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

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

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good LOCK #: 3250

REMARKS: Sheen on top of Purge water

All Samples taken.

Meter Calibration: Date: 2-10-93 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 2

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-035-01 SAMPLE ID: MW-2

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6041

SAMPLED BY: M. Gallegos LOCATION: Dublin, 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.): 41.37

DEPTH TO WATER (feet): 7.30 CALCULATED PURGE (gal.): 13.13

DEPTH OF WELL (feet): 14.0 ACTUAL PURGE VOL. (gal.): 135

DATE PURGED: 2-10-93 Start (2400 Hr) 1256 End (2400 Hr) 1305

DATE SAMPLED: 2-10-93 Start (2400 Hr) 1310 End (2400 Hr) 1312

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1259	41.5	7.71	3830	66.2	Cloudy	Heavy
1302	90	7.22	4040	65.9	"	"
1305	135	7.13	4040	66.1	"	"

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

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump X Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: All Samples Taken

Meter Calibration: Date: 2-10-93 Time: ___ Meter Serial #: 41972 Temperature °F: ___

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

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: ___ Page 2 of ___

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-035-01 SAMPLE ID: MW-3

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6141

SAMPLED BY: M. Gallegos LOCATION: San Jose, Austin, TX

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

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

CASING ELEVATION (feet/MSL): N.R VOLUME IN CASING (gal.): 4.39

DEPTH TO WATER (feet): 7.87 CALCULATED PURGE (gal.): 13.19

DEPTH OF WELL (feet): 14.6 ACTUAL PURGE VOL (gal.): 5.0

DATE PURGED: 2-10-93 Start (2400 Hr) 1339 End (2400 Hr) 1341

DATE SAMPLED: 2-10-93 Start (2400 Hr) 1348 End (2400 Hr) 1350

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1341	4.5	7.75	2600	65.7	Cloudy	Heavy
1350	recharge	7.51	2590	65.9	"	"

D. O. (ppm): N.R ODOR: None NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X 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: Good LOCK #: 8259

REMARKS: Well Dried at 5.0 gallons

All Samples taken

Meter Calibration: Date: 2-10-93 Time: ___ Meter Serial #: 4922 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: [signature] Reviewed By: ___ Page 3 of 3

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-035-01 | SAMPLE ID: MW-4

PURGED BY: M Gallegos | CLIENT NAME: ARCO #6041

SAMPLED BY: M. Gallegos | LOCATION: Dublin, 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.): 5.03

DEPTH TO WATER (feet): 6.50 | CALCULATED PURGE (gal.): 15.09

DEPTH OF WELL (feet): 14.5 | ACTUAL PURGE VOL (gal.): 12.0

DATE PURGED: 2-10-93 | Start (2400 Hr) 1116 | End (2400 Hr) 1124

DATE SAMPLED: 2-10-93 | Start (2400 Hr) 1129 | End (2400 Hr) 1131

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1118	5.0	6.93	6620	62.4	Cloudy	Heavy
1122	10.0	7.16	6610	64.1	"	"
1131	recharge	7.07	6500	64.0	"	"

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

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good | LOCK #: 3259

REMARKS: Purged dry at 12.0 gallons

All samples taken

Meter Calibration: Date: 2-10-93 | Time: 1115 | Meter Serial #: 4972 | Temperature °F: 64.5

(EC 1000 ~~1265~~ 806 / 1000) (DI ___) (pH 7 6.34 / 7.00) (pH 10 8.55 / 10.00) (pH 4 4.03 / ___)

Location of previous calibration: ___

Signature: [signature] | Reviewed By: JK | Page ___ of ___

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-035-01 SAMPLE ID: MW-5

PURGED BY: M. Ballegos CLIENT NAME: ARCO #6041

SAMPLED BY: M Ballegos LOCATION: Alameda, 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.): 1.14

DEPTH TO WATER (feet): 8.00 CALCULATED PURGE (gal.): 18.42

DEPTH OF WELL (feet): 17.4 ACTUAL PURGE VOL (gal.): 18.5

DATE PURGED: 2-10-93 Start (2400 Hr) 1145 End (2400 Hr) 1157

DATE SAMPLED: 2-10-93 Start (2400 Hr) 1203 End (2400 Hr) 1205

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1149	6.0	7.95	5330	63.7	Cloudy	Heavy
1152	12.0	7.72	5420	65.1	Cloudy-Brn	Heavy
1157	18.5	7.70	5420	65.7	Cloudy-Brn	Heavy

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

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump X Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: 3255

REMARKS: All Samples taken

Meter Calibration: Date: 2-10-93 Time: ___ Meter Serial #: 4497 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: Michael J. Ballegos Reviewed By: JP Page 5 of 5

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-035-01 | SAMPLE ID: MW-6

PURGED BY: M. Gallegos | CLIENT NAME: ARCO #6041

SAMPLED BY: M. Gallegos | LOCATION: Dublin, 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.): 4.95

DEPTH TO WATER (feet): 8.22 | CALCULATED PURGE (gal.): 14.85

DEPTH OF WELL (feet): 15.8 | ACTUAL PURGE VOL (gal.): 15.0

DATE PURGED: 2-10-93 | Start (2400 Hr) 1227 | End (2400 Hr) 1236

DATE SAMPLED: 2-10-93 | Start (2400 Hr) 1242 | End (2400 Hr) 1244

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1230	5.0	7.99	7120	67.5	BROWN	Heavy
1233	10.0	7.80	7210	68.1	"	"
1236	15.0	7.71	7180	68.1	"	"

D. O. (ppm): NR | ODOR: None | 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

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good | LOCK #: 3254

REMARKS: All Samples taken

Meter Calibration: Date: 2-10-93 Time: ___ Meter Serial #: 4672 Temperature °F: ___

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

Location of previous calibration: MW-4

Signature: M. Gallegos | Reviewed By: ___ | Page 6 of ___

EMCON
ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date January 25, 1993
Project 0G70-035.01

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 Results
	January 1993 monthly water level survey, ARCO
	station 6041, 7249 Village Parkway, Dublin, 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:

Jim Butera JB

Robert C Porter

Robert Porter, Senior Project Engineer.

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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-035.01 STATION ADDRESS : 7249 Village Parkway, Dublin, CA DATE : 1-15-93

ARCO STATION # : 6041 FIELD TECHNICIAN : REICHELDERFER / ADLER DAY : FRIDAY

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-4	OK	YES	OK	3259	OK	7.27	7.27	ND	NA	14.5	—
2	MW-5	OK	YES	OK	3259	OK	8.14	8.14	ND	NA	17.4	—
3	MW-6	OK	YES	OK	3259	OK	7.64	7.64	ND	NA	15.8	BOX COMPLETELY FULL OF WATER; WELL IS UNDER PRESS.
4	MW-2	OK	YES	OK	3259	BAD	7.20	7.20	ND	NA	14.1	NEEDS NEW LINC; BOX COMPLETELY FULL OF WATER
5	MW-1	OK	YES	OK	3259	OK	8.88	8.88	ND	NA	17.5	WATER IN BOX, ABOVE LWC
6	MW-3	OK	YES	OK	3251	OK	7.66	7.66	ND	NA	19.7	↓

SURVEY POINTS ARE TOP OF WELL CASINGS

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

February 2, 1993
Project: 0G70-035.01

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

Re: First quarter 1993 monitoring event at ARCO service station 6041, located at 7249 Village Parkway, Dublin, California.

Dear Mr. Coffman:

The first quarter 1993 monitoring event for the ARCO site located at 7249 Village Parkway, Dublin, California, is scheduled for February 9, 1993.

A copy of the proposed ground-water sampling and analysis request form is attached for your review.

Unless otherwise indicated, all samples will be analyzed by Columbia Analytical Services in San Jose, California.

Please make any changes or corrections to the request in **red ink**. Sign and date the request in the appropriate location in the upper right-hand corner, and return the request to me by February 8,1993.

If you have any problems with the scheduling of this job, please contact me at (408) 453-2266.

Very truly yours,

EMCON Associates

Jim Butera
Sampling Coordinator

Attachment: Proposed first quarter 1993 sampling and analysis request form
cc: Kyle Christie, ARCO Products Company

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

Associates - Ground Water Sampling and Analysis Request Form

PROJECT NAME : **ARCO STATION 6041**
7249 Village Parkway, Dublin, CA

EMCON Project # : 0G70-035.01

DATE SUBMITTED : ~~09-Feb-93~~

Lead Consultant: RESNA

Authorized By: B. Ziemiński

Date: 02/08/93

Lead Contact: Joel Coffman
[redacted]ski

Phone Number: (408) 264-7723

Results Due By: 9-Mar-93

Site Contact: _____

Site Phone#: _____

Well Locks: Master Lock 3259

SPECIAL INSTRUCTIONS / CONSIDERATIONS :
Quarterly Monitoring - Second Month of the Quarter
Perform a water level survey prior to sampling (see ARCO SOP).
Well survey points are top of well casings.
Purge three (3) casing volumes.
Purging equipment must be the same from quarter to quarter.
You will have to bring one lined drum for purge water transport
Bring 15/16 socket for well access
MW-3 may dry and is very slow to recharge.
Dry this well first and dedicate a teflon bailer so as to not cross contaminate.
Sample each well with a Teflon bailer. Sample IDs should include the depth at which the sample was collected [i.e.MW-1(10) means well MW-1 was sampled at a depth of 10 feet]. This should be done on both the sample bottles and the chain-of-custody forms.

Well ID or Source	Casing Diameter (inches)	Casing Length (feet)	Floating Product (feet)	Scheduled Purging Equipment	Analyses Requested
MW-4	4.0	14.5	NA	PVC Bailer	**TPH-Gasoline**
MW-5	4.0	17.5	NA	PVC Bailer	**BTEX**
MW-6	4.0	15.8	NA	PVC Bailer	
MW-2	4.0	14.1	ND	PVC Bailer	
MW-3	4.0	14.7	ND	PVC Bailer	
MW-1	4.0	17.5	ND	PVC Bailer	

Above wells in indicated order

FB-1 (Field Blank)

Laboratory Instructions:
Provide lowest detection limits possible.

ND = None Detected IP = Intermitent Product