Applied GeoSystems, Inc.
A RESNA Company

RESNA
Working To Restore Nature

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

92 APR -7 PM 2:08

TRANSMITTAL

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

DATE: 4/6/92
PROJECT NUMBER: 60006.03
SUBJECT: ARCO STATION 6041, 7249 VILLAGE PARKWAY, DUBLIN, CALIFORNIA.

FROM: JOEL COFFMAN
TITLE: PROJECT GEOLOGIST

WE ARE SENDING YOU [ ] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [X] Reports [ ] Specifications

[ ] Letters [ ] Change Orders [ ] _____

COPIES	DATED	NO.	DESCRIPTION
1	4/6/92		FINAL-LETTER REPORT ON QUARTERLY GROUNDWATER MONITORING FOR THE FOURTH QUARTER 1991 AT THE ABOVE SUBJECT SITE.

THESE ARE TRANSMITTED as checked below:

[ ] For review and comment [ ] Approved as submitted [ ] Resubmit ___ copies for approval

[X] As requested [ ] Approved as noted [ ] Submit___ copies for distribution

[ ] For approval [ ] Return for corrections [ ] Return ___ corrected prints

[ ] For your files [ ] _____

REMARKS: THIS REPORT HAS BEEN FORWARDED TO YOU AT THE REQUEST OF MR. MICHAEL WHELAN ,ARCO PRODUCTS COMPANY.

Copies: 1 to project file no. 60006.03

*Revision Date: 11/21/91
*File Name: TRANSMT.PRJ

10

January 14, 1992

92 JAN 15 PM 2:17

Mr. Edgar Howell
Alameda County Department of Environmental Health
80 Swan Way
Oakland, California 94621

ARCO Products Company Facilities in Alameda County

Dear Mr. Howell:

Please find attached, Quarterly Summary Reports (QSRs) for ARCO Products Company Service Stations in Alameda County. The QSRs summarize activities conducted by ARCO at the respective sites during the fourth quarter of 1991; also included are projected site activities for the first quarter of 1992 and a bibliography of reports submitted for each location.

The QSRs are classified by city and address within Alameda County. We are submitting this document and attached QSRs as agreed. Please note that we are forwarding copies of the QSRs to the Regional Water Quality Control Board (RWQCB).

Please note that ARCO Products Company has reviewed the RWQCB's February 19, 1991 printout of ARCO fuel leak sites. We have evaluated each site with respect to ARCO's responsibility for investigation, monitoring, and/or remediation. Those locations for which ARCO is not responsible were listed and described in the QSR package delivered to you on July 15, 1991. The attached QSRs therefore represent only those locations for which ARCO is responsible.

ARCO is planning a subsequent comprehensive QSR submittal for ARCO sites on April 15, 1992. Please do not hesitate to contact us with any questions regarding this submittal.

Sincerely yours,

James D Ritchie /for

Kyle A. Christie
Environmental Engineer

Attachments: ARCO Facility QSRs

A:\arcoqsrs\consmrg.ltr
50013-004-06

UST LEAK SITE UPDATE

Date of Last Review/Update: September 6, 1991

Current Date: January 6, 1992

SITE IDENTIFICATION

Name: ARCO Products Company 6041 Case No.:

Address: 7249 Village Parkway (Street Number / Street)

Dublin (City) ZIP Code:

County: Alameda Substance: Gasoline

Local Agency: Alameda County Health Care Services Agency

Regional Board: Regional Water Quality Control Board - San Francisco Bay Area

LEAD STAFF PERSON

ACHCSA - Larry Seto

CASE TYPE

X	Undetermined		Soil Only		Ground Water		Drinking Water

STATUS (Date indicates when case moved into status)

	No Action Taken	
X	Leak Being Confirmed	Date 9/26/90
X	Preliminary Site Assessment Workplan Submitted	Date 8/22/91
X	Preliminary Site Assessment Underway	Date 9/91
	Pollution Characterization	Date
	Remediation Plan	Date
	Remedial Action Underway	Date
	Post Remedial Action Monitoring	Date
	Case Referred to Regional Board	Date
	Case Referred to Dept. of Health Services	Date
	Case Closed	Date

COMMENTS/MILESTONES:

Waste-oil tank removed from site in June 1990; approximately 20 cubic yards of soil was removed. No further work necessary in area of former waste-oil tank (soil samples nondetectable).

RECENT ACTIVITIES/FINDINGS:

Last Quarter Activities: Submitted Work Plan for further investigation at the site on 8/22/91.

Current Quarter Activities: Drilled and installed three groundwater monitoring wells (MW-1 through MW-3) in September 1991. Performed monthly groundwater monitoring and reporting.

ANTICIPATED ACTIVITIES:

Next Quarter Activities: Submit report of subsurface investigation. Submit Addendum to Work Plan. ARCO to perform monthly groundwater monitoring, and prepare quarterly groundwater monitoring report.

Reports documenting the site's history are listed on page 2.

REPORT	DATE	CONSULTANT
Work Plan for Subsurface Investigations and Remediation at ARCO 6041 60006.02	8/22/91	RESNA/Applied GeoSystems
Addendum One to Work Plan Subsurface Investigation at ARCO Station 6041 60006.02	8/22/91	RESNA/Applied GeoSystems
Letter Report-Limited Subsurface Investigation Related to the Removal of Waste-Oil Tank at ARCO Station 6041 60006.01	9/19/90	Applied GeoSystems

UST LEAK SITE UPDATE

Date of Last Review/Update _____

Current Date July 15, 1991

SITE IDENTIFICATION

Name ARCO SERVICE STATION #6041 Case No. _____

Address 7249 Village Parkway
Street Number Street

Dublin, CA
City Zip Code

Alameda County Substance hydrocarbons
County

Local Agency Alameda County Environmental Health Department

Regional Board San Francisco Bay Region

LEAD STAFF PERSON unknown

CASE TYPE

_____ Undetermined _____ Soil Only _____ Ground Water _____ Drinking Water

STATUS (Date indicates when case moved into status)

_____	No Action Taken	Date _____
_____	Leak Being Confirmed	Date _____
_____	Preliminary Site Assessment Workplan Submitted	Date _____
_____	Preliminary Site Assessment Underway	Date _____
_____	Pollution Characterization	Date _____
_____	Remediation Plan	Date _____
_____	Remedial Action Underway	Date _____
_____	Post Remedial Action Monitoring	Date _____
_____	Case Referred to Regional Board	Date _____
_____	Case Referred to Dept. of Health Services	Date _____
_____	Case Closed	Date _____

REMEDIAL ACTION

COMMENTS

ARCO is currently evaluating data from this site for further activities.

RESPONSIBLE PARTY IDENTIFICATION (Only if newly discovered or changed)

Name _____

Contact _____ Phone ( ) _____

Address _____
Street Number Street

_____
City State Zip Code

USTARCO.FRM/12/90ssj

July 15, 1991

Alameda County Department of Environmental Health
80 Swan Way
Oakland, California 94621

Attention: Mr. Rafat Shahid

ARCO Products Company Facilities in Alameda County - RWQCB Fuel Leaks List

Dear Mr. Shahid

Please find attached, Quarterly Summary Reports (QSRs) for ARCO Products Company Service Stations in Alameda County. The QSRs summarize activities conducted by ARCO at the respective sites during the second quarter of 1991; also included are projected site activities for the third quarter of 1991 and a bibliography of reports submitted for each location.

The QSRs are classified by address within the County. We are submitting this document and attached QSRs as agreed in our recent meeting with the RWQCB. Please note that we are forwarding copies of the QSRs to the RWQCB as well.

ARCO Products Company has reviewed the Regional Water Quality Control Board's (RWQCB) February 19, 1991 printout of ARCO fuel leak sites in the San Francisco Bay Area. We have evaluated each site with respect to ARCO's responsibility for investigation, monitoring, and/or remediation. It is ARCO's belief that several of the sites originally attributed to ARCO are actually the responsibility of other parties. We have therefore prepared QSRs and a brief discussion regarding those sites which we believe should either be removed from ARCO responsibility or be considered for closure.

ARCO is planning a subsequent comprehensive QSR submittal for ARCO sites on October 15, 1991. Please do not hesitate to contact us with any questions regarding this submittal.

Sincerely,

for Kyle A. Christie
Environmental Engineer

Attachments:
Non-ARCO Facility/Site Closure Discussion and QSRs
ARCO Facility QSRs

Alameda County Sites

Two ARCO facilities including Station Numbers 4977 and 6002 (located at 2770 Castro Valley Road, Castro Valley and 6235 Seminary Avenue, Oakland) experienced vapor/vent line failure during UST system precision testing. In accordance with State Water Resources Control Board (SWRCB) letter LG-43, ARCO requests that these facilities be removed from the RWQCB fuel leaks list.

A small volume of hydrocarbons were released from ARCO Station Number 498 located at 286 South Livermore Avenue, Livermore. The product was released to an on-site secondary containment trench and was subsequently removed; no product was released to the soil or groundwater. Alameda County issued a letter to ARCO on May 24, 1991 stating that no further action is necessary at this site.

A total of seven Alameda County ARCO facilities listed by the RWQCB were not ARCO-owned at the time of the release discovery and/or report. These sites include Station Numbers 188, 329, and 623 (respectively located at 4191 First Street, Pleasanton, 2032 12th Street, Oakland, and 2110 Mountain, Oakland) and facilities located at 2951 High Street, 4401 Market Street, 2844 Mountain Boulevard, and 2740 98th Street, Oakland.

ARCO has prepared QSRs for each of these facilities; however, we request that the cases be omitted from the leaks list or be referred to the actual responsible party, as appropriate. The ownership information for the individual sites is included on the attached QSRs.

Finally, the RWQCB February 19, 1991 printout lists two sites which are actually the same. The facility listed as 71 MacArthur Boulevard is actually ARCO Service Station Number 4931 located at 731 West MacArthur Boulevard in Oakland.

Attachment:
Non-ARCO Facility QSRs

NON-ARCO FACILITY/SITE CLOSURE DISCUSSION AND QSRS

Alameda County

Applied GeoSystems, Inc.
A RESNA Company

RESNA
Working To Restore Nature

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

LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Fourth Quarter 1991
at
ARCO Station 6041
7249 Village Parkway
Dublin, California

4/5/92

60006.03

Applied GeoSystems, Inc.
A RESNA Company

RESNA
Working To Restore Nature

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

April 5, 1992
0212ccar
60006.03

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

Subject: Fourth Quarter 1991 Groundwater Monitoring Report for ARCO Station 6041, 7249 Village Parkway, Dublin, California.

Mr. Whelan:

At the request of ARCO Products Company (ARCO), this letter report summarizes the methods and results of fourth quarter 1991 groundwater monitoring performed by RESNA Industries, Inc. (RESNA) at the above-referenced site. The station is located in a commercial and residential area at 7249 Village Parkway, Dublin, California, as shown on the Site Vicinity Map, Plate 1. ARCO has requested that RESNA perform quarterly groundwater monitoring and sampling of all onsite monitoring wells to evaluate trends in gasoline hydrocarbon concentrations associated with a reported fuel spill and the local groundwater gradient over time.

Prior to the present monitoring, RESNA (formerly Applied GeoSystems [AGS]) performed the following environmental and subsurface investigations for the site. On June 6 and 7, 1990, RESNA supervised the excavation and removal of one 550-gallon waste-oil tank (AGS, September 1990). Based on field observations during tank removal that indicated that the tank was in good condition laboratory analyses results that indicated the soil beneath the tank was not significantly impacted by petroleum hydrocarbons, it was decided that extensive excavation of soil in the vicinity of the tank was not required. On September 25, 1990, a spill of approximately 10 gallons (estimated by Tom Hathocox of Dogherty Regional Fire Department) was reported. In September 1991, RESNA performed a subsurface environmental investigation which included drilling three soil borings (B-1 through B-3), collecting soil samples from the borings, constructing 4-inch-diameter groundwater monitoring wells in the borings (MW-1 through MW-3, respectively), and developing and sampling the monitoring wells (RESNA, February 1992). 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

RESNA personnel performed initial groundwater monitoring in September 1991 as part of the subsurface investigation and initiated monthly groundwater monitoring in October 1991. RESNA personnel performed the monthly groundwater monitoring on October 22, November 27, and December 16, 1991, and quarterly groundwater sampling on December 16, 1991. Field work consisted of measuring depth-to-water (DTW) levels, subjectively analyzing water for the presence of petroleum hydrocarbon sheen and floating product, and on December 16, 1991, purging and sampling wells MW-1 through MW-3 for laboratory analyses. The groundwater sampling protocol is attached in Appendix A.

The DTW levels, wellhead elevations, and groundwater elevations for these monitoring episodes are summarized in Table 1, Cumulative Groundwater Monitoring Data. Water elevations fluctuated up to 0.44 feet between September and December 1991. The groundwater gradients interpreted for October, November, and December 1991, indicate a very flat gradient (<0.01) toward the southwest, north, and northeast, respectively. The fluctuating groundwater direction may be due to local pumping for irrigation or other causes. Water elevation data from October, November, and December 1991, were interpreted as shown on the Groundwater Gradient Maps, Plates 3 through 5.

During our subjective analyses of groundwater samples from wells MW-1 through MW-3 during this quarter we did not observe evidence of petroleum hydrocarbons. The results of our field observations are summarized in Table 1.

On December 16, 1991, wells MW-1 through MW-3 were purged and sampled in accordance with the attached protocol (Appendix A). Well purge water was disposed by a licensed waste hauler. A copy of the Monitoring Well Purge Water Disposal Form is attached in Appendix A.

Laboratory Methods

Water samples collected from wells MW-1 through MW-3 were delivered under Chain of Custody protocol to Sequoia Analytical in Redwood City, California (Hazardous Waste Testing Laboratory Certification No. 1210). These water samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg), and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8015/8020.

Laboratory Results

Results of these and previous water analyses are summarized in Table 2, Cumulative Results of Laboratory Analyses of Groundwater Samples. The TPHg and benzene concentrations are summarized on Plates 6 and 7, respectively. Laboratory analysis reports are included in Appendix A.

Results of this quarter's laboratory analyses of water samples indicated the following.

- TPHg was detected in the groundwater at concentrations of 840 parts per billion (ppb) in MW-1, 83 ppb in MW-2, and 1,000 ppb in MW-3.

- Benzene was detected in the groundwater at concentrations of 50 ppb in MW-1 and 180 ppb in MW-3, which are greater than the State Maximum Contaminant Level (MCL) of 1 ppb benzene; benzene concentration of 0.96 ppb was detected in MW-2, which is less than the MCL.

- Toluene was detected in the groundwater at concentrations of 50 ppb in MW-1 and 5.1 ppb in MW-3, but were not detected in MW-2. These concentrations are less than the recommended action levels (DWAL) of 100 ppb toluene.

- Ethylbenzene was detected in the groundwater at concentrations of 3.9 ppb in MW-1 and 23 ppb in MW-3, but was not detected in MW-2. These concentrations are less than the MCL of 680 ppb ethylbenzene.

- Total xylenes were detected in the groundwater at concentrations of 12 ppb in MW-1 and 4.3 ppb in MW-3, but were not detected in MW-2. These concentrations are less than the MCL of 1,750 ppb total xylenes.

Conclusions and Recommendations

Groundwater on this site has been impacted by gasoline hydrocarbons; the lateral extent of petroleum hydrocarbons has not been delineated. The laboratory results for this quarterly monitoring period are generally consistent with those from our limited environmental investigation performed on September 20, 1991. RESNA recommends continued quarterly

groundwater monitoring at this site and laboratory analyses of groundwater samples for TPHg and BTEX. Additional recommendations will be included under separate cover.

Schedule

Monthly DTW measurements and quarterly sampling will continue. At ARCO's request, RESNA will continue to analyze and report monthly and quarterly groundwater data. The next quarterly sampling episode is scheduled for March 1992.

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

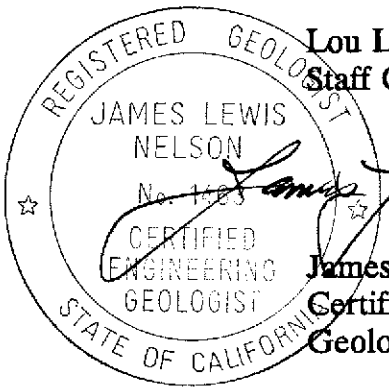
Mr. Ravi Arulanantham
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Mr. Eddy So
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

Lou Leet
Staff Geologist



James L. Nelson
Certified Engineering
Geologist 1463

RESNA

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 22, 1991
Plate 4, Groundwater Gradient Map, November 27, 1991
Plate 5, Groundwater Gradient Map, December 16, 1991
Plate 6, TPHg Concentrations in Groundwater, December 16, 1991
Plate 7, Benzene Concentrations in Groundwater, December 16, 1991

Table 1, Cumulative Groundwater Monitoring Data
Table 2, Cumulative Results of Laboratory Analyses of Groundwater Samples

Appendix A: Groundwater Sampling Protocol
Chain of Custody Record
Laboratory Analysis Reports
Monitoring Well Purge Water Disposal Form

REFERENCES CITED

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.

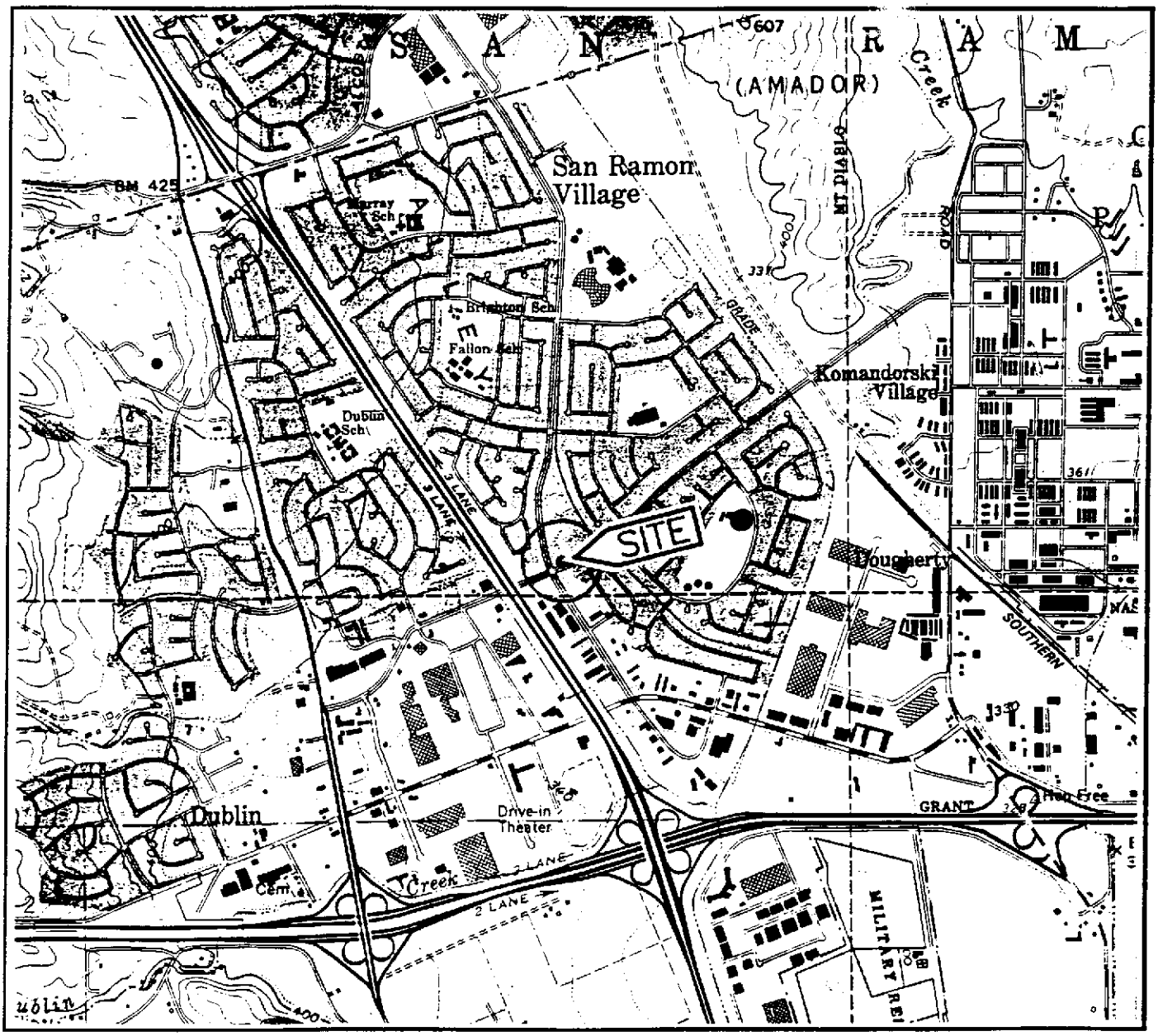
California Department of Water Resources, 1974. Evaluation of Ground-Water Resources Engineering Livermore and Sunol Valleys; Bulletin No. 118-2, Appendix A.

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



Base: U.S. Geological Survey
7.5–Minute Quadrangle
Dublin, California
Photorevised 1980

LEGEND

⊙ = Site Location

N

Approximate Scale

2000 1000 0 2000 4000

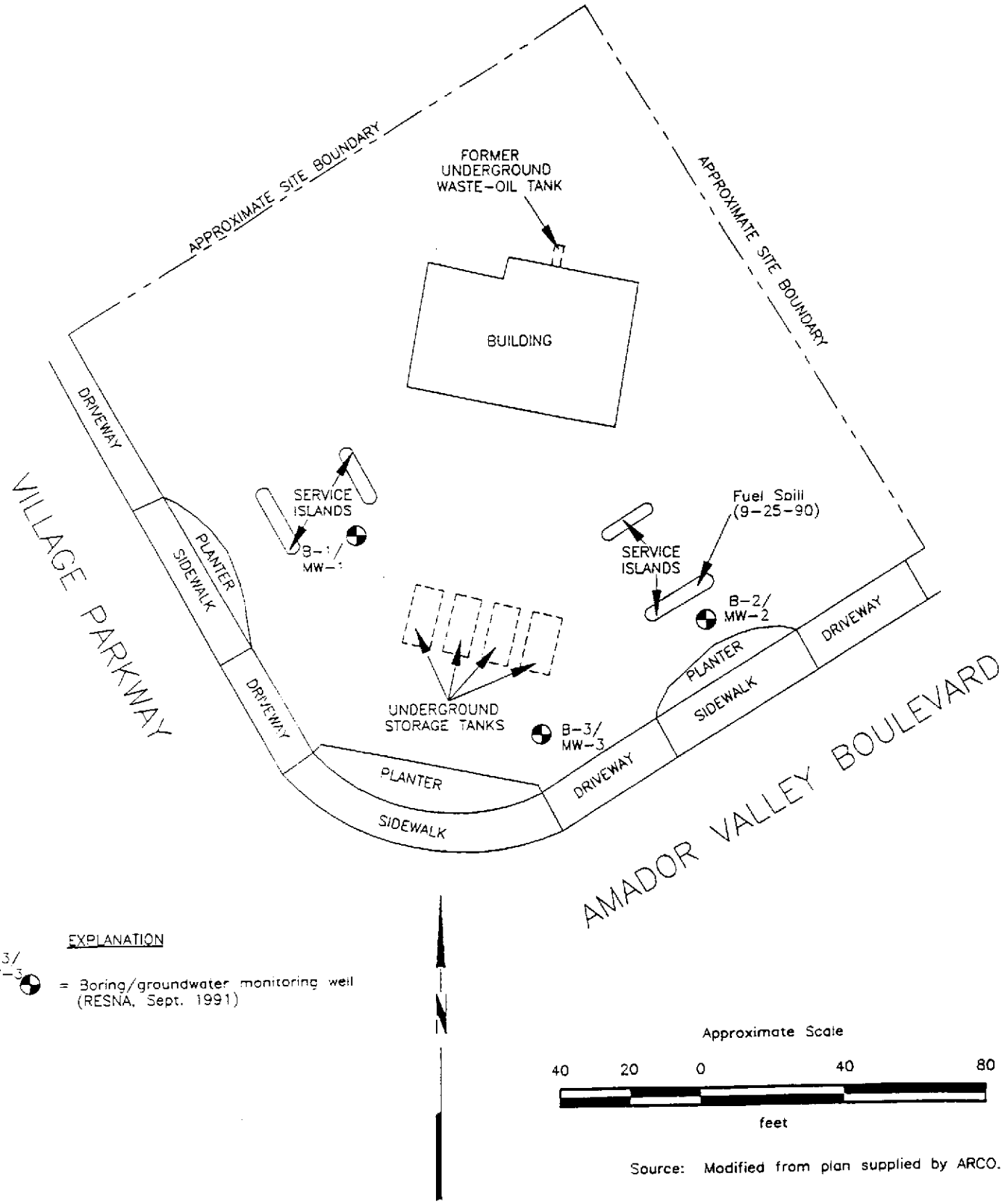
feet

RESNA

PROJECT 60006.03

SITE VICINITY MAP
ARCO Service Station 6041
7249 Village Parkway
Dublin, California

PLATE 1



EXPLANATION

B-3/ MW-3 = Boring/groundwater monitoring well (RESNA, Sept. 1991)

N

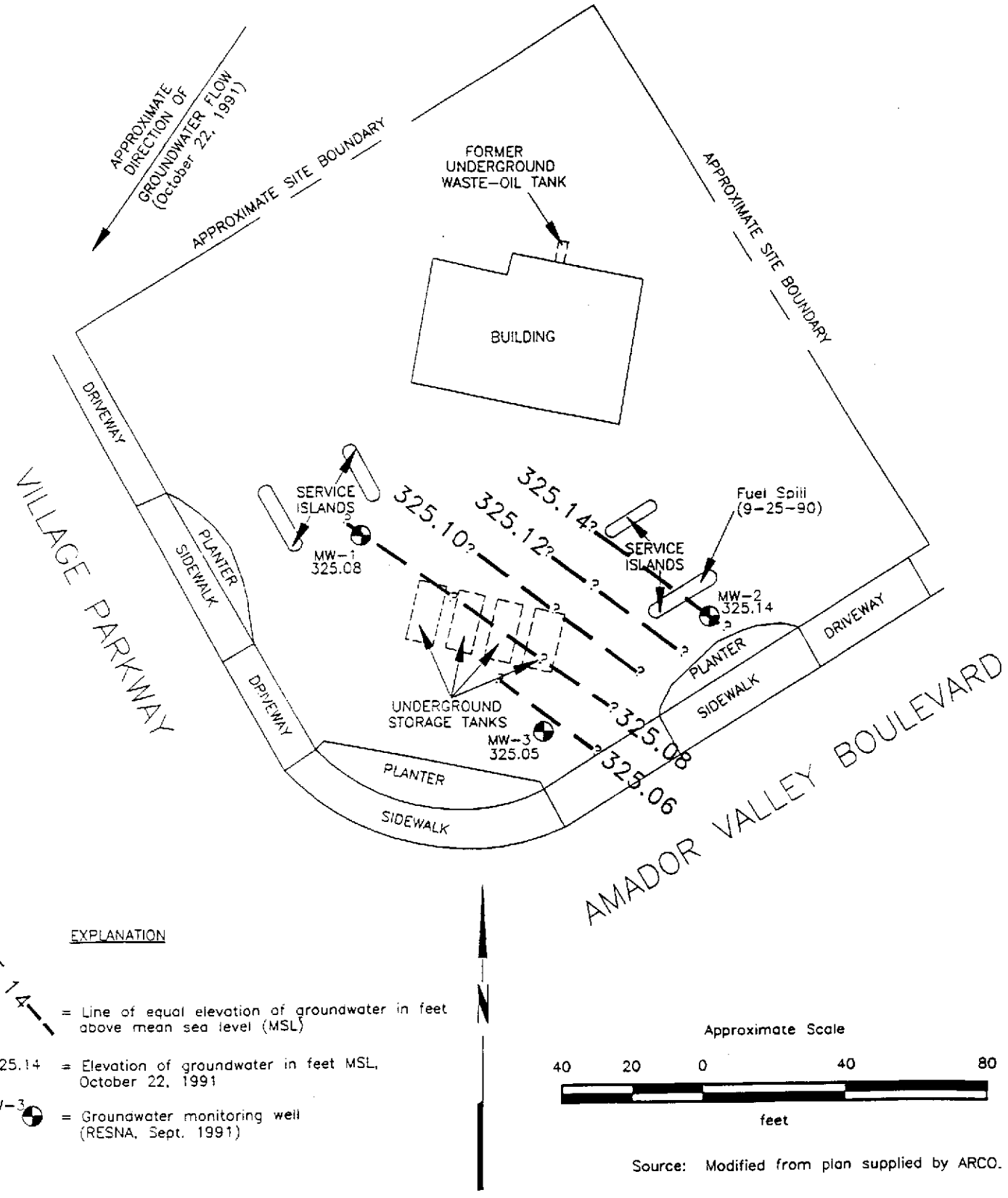
Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

RESNA	**GENERALIZED SITE PLAN** **ARCO Service Station 6041** **7249 Village Parkway** **Dublin, California**	**PLATE** **2**
PROJECT 60006.03		



EXPLANATION

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

325.14 = Elevation of groundwater in feet MSL, October 22, 1991

MW-3 = Groundwater monitoring well (RESNA, Sept. 1991)

Approximate Scale

40 20 0 40 80

feet

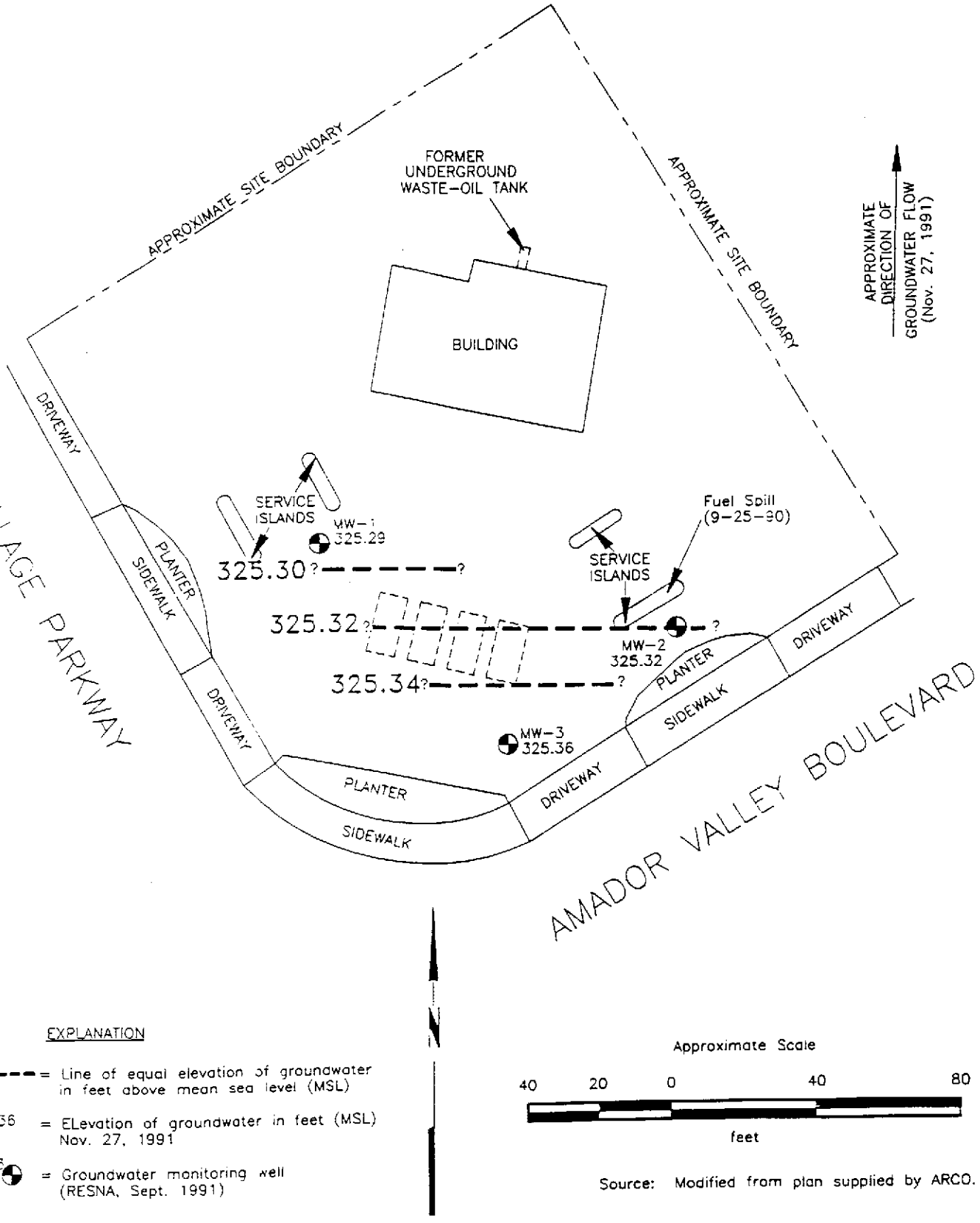
Source: Modified from plan supplied by ARCO.

RESNA

PROJECT 60006.03

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

PLATE
3



EXPLANATION

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

325.36 = ELevation of groundwater in feet (MSL) Nov. 27, 1991

MW-3 = Groundwater monitoring well (RESNA, Sept. 1991)

Approximate Scale

40 20 0 40 80

feet

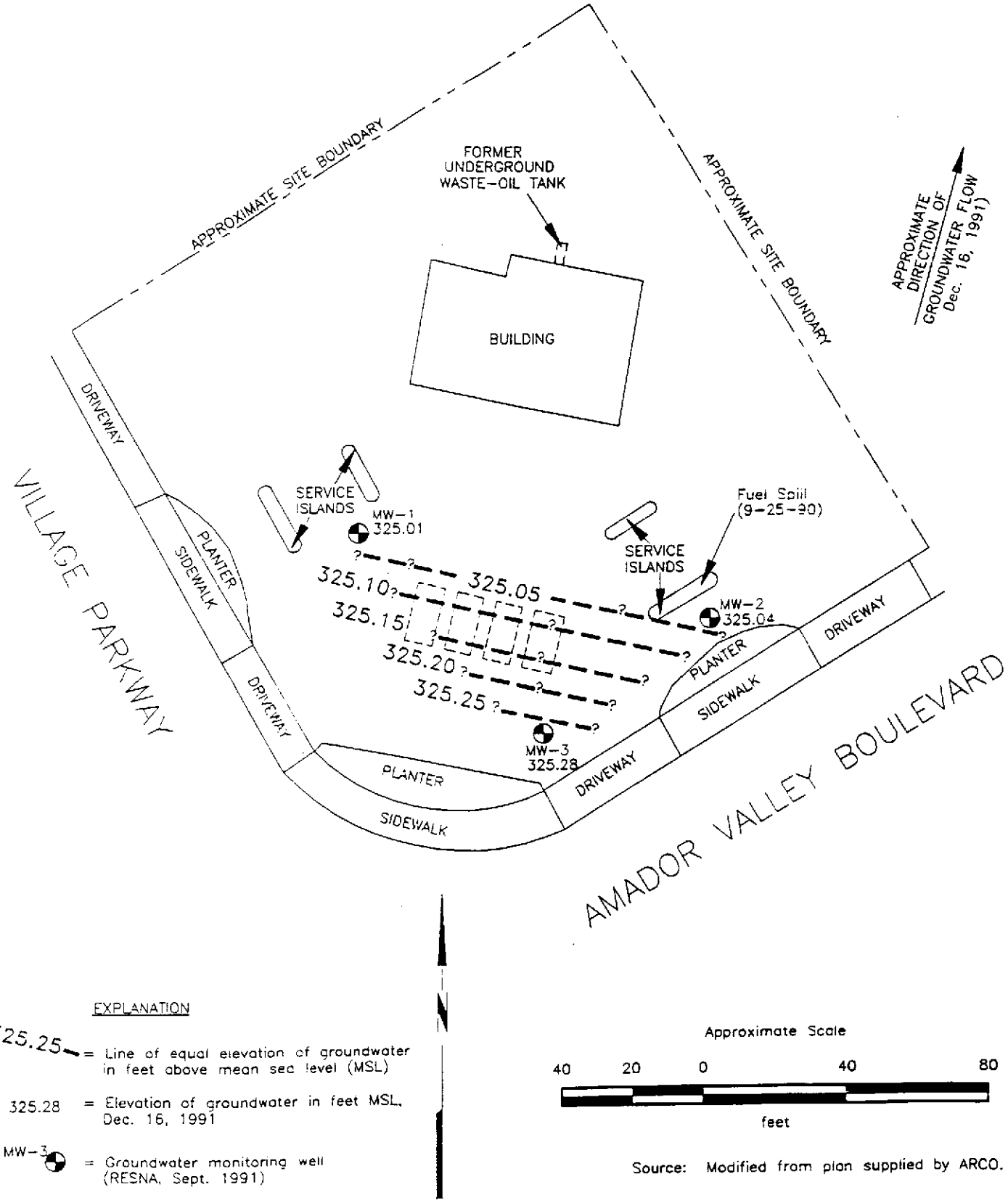
Source: Modified from plan supplied by ARCO.

RESNA

PROJECT 60006.03

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

PLATE
4



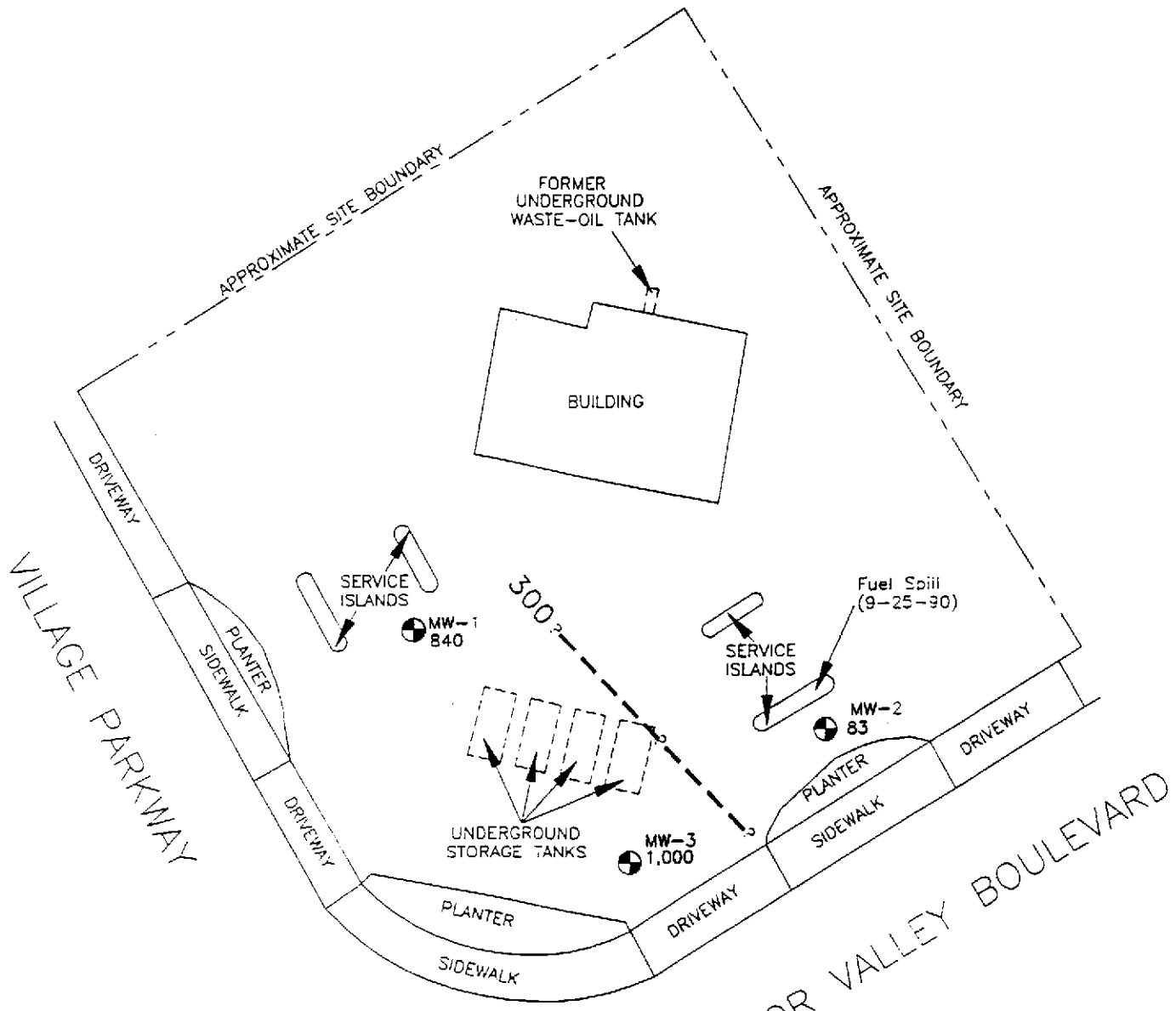
Source: Modified from plan supplied by ARCO.

RESNA

PROJECT 60006.03

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

PLATE
5



EXPLANATION

300 = Line of equal concentration of TPHg in groundwater, in ppb

1,000 = Concentration of TPHg in groundwater, in ppb, December 16, 1991

MW-3 = Groundwater monitoring well (RESNA, Sept. 1991)

N

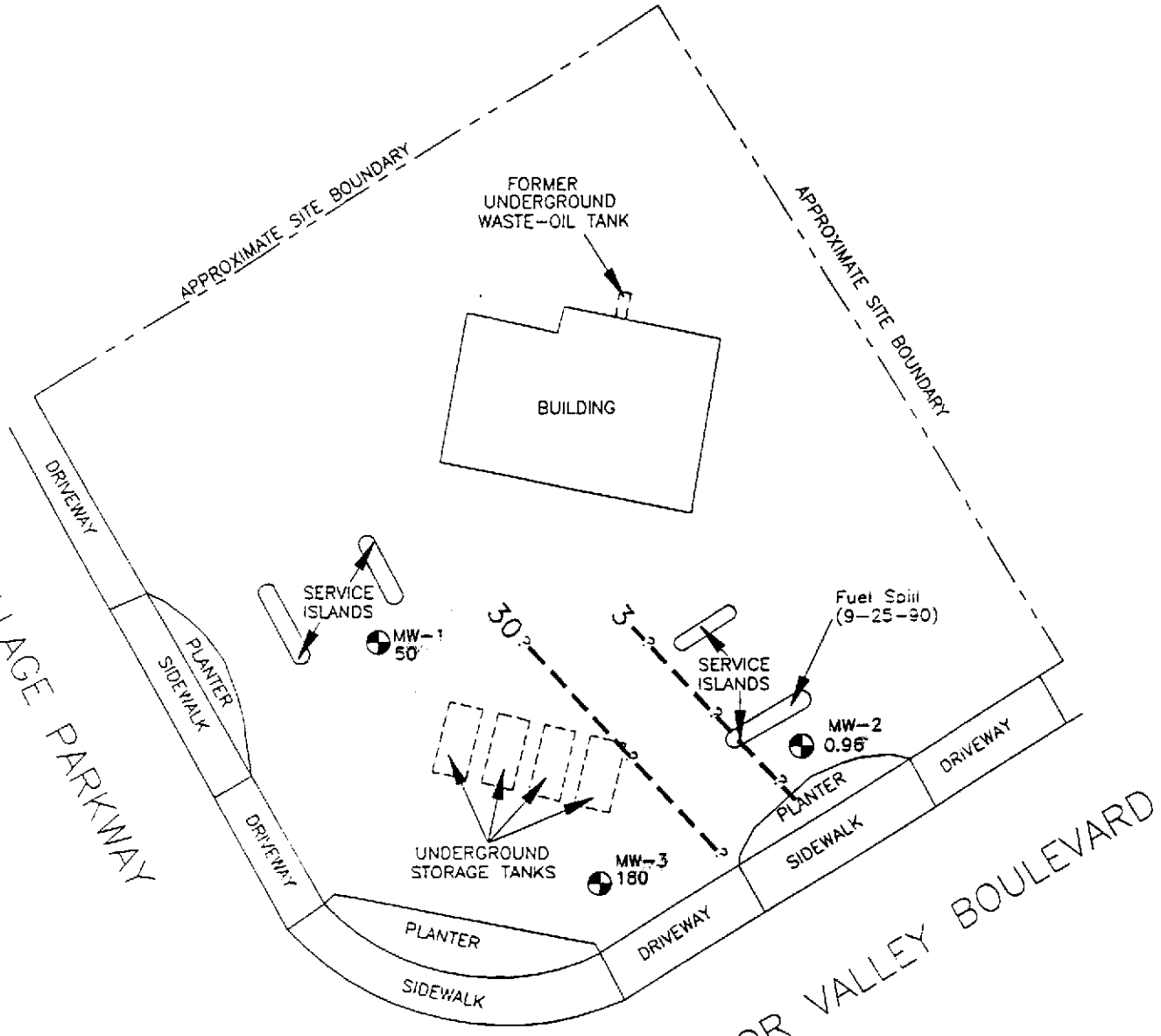
Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

RESNA	**TPHg CONCENTRATIONS IN GROUNDWATER ARCO Service Station 6041 7249 Village Parkway Dublin, California**	**PLATE 6**
PROJECT 60006.03		



EXPLANATION

30 = Line of equal concentration of Benzene in groundwater, in ppb

180 = Concentration of Benzene in groundwater, in ppb, December 16, 1991

MW-3 = Groundwater monitoring well (RESNA, Sept. 1991)

N

Approximate Scale

40 20 0 40 80

feet

Source: Modified from plan supplied by ARCO.

RESNA	**BENZENE CONCENTRATIONS IN GROUNDWATER ARCO Service Station 6041 7249 Village Parkway Dublin, California**	**PLATE 7**
PROJECT 60006.03		

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6041
Dublin, California

Date Measured	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1				
9-20-91	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
MW-2				
9-20-91	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
MW-3				
9-20-91	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

Measurements in feet.
Wells surveyed on October 11, 1991. Datum is City of Dublin = (USGS)

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF GROUNDWATER SAMPLES
ARCO Station 6041
Dublin, California

Sample ID	TPHg	Benzene	Toluene	Ethyl-benzene	Total xylenes
MW-1					
9-20-91	410	28	36	4.3	89
12-16-91	[illegible]	50	50	3.9	12
MW-2					
9-20-91	130	6.6	0.96	1.4	1.5
12-16-91	83	0.96	<0.30	<0.30	<0.30
MW-3					
9-20-91	990	50	100	11	200
12-16-91	[illegible]	[illegible]	5.1	23	4.3
MCL	—	1	—	680	1,750
DWAL	—	—	100	—	—

Results in parts per billion (ppb)
Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 5030/8015/8020.
TPHg: Total petroleum hydrocarbons as gasoline (analyzed by EPA Method 5030/8015/8020).
MCL: Maximum contaminant level in drinking water (DHS, July 1989).
DWAL: Department of Health Services Recommended drinking water action level (DHS, January 1990).

Sample Identification: MW-3
└— Monitoring well number

APPENDIX A

GROUNDWATER SAMPLING PROTOCOL
CHAIN OF CUSTODY RECORD
LABORATORY ANALYSIS REPORTS
MONITORING WELL PURGE WATER DISPOSAL FORM

GROUNDWATER SAMPLING PROTOCOL

The static water level in each well that contained water was measured with a Solinst® water-level indicator; this instrument is accurate to the nearest 0.01 foot. These groundwater depths were subtracted from wellhead elevations measured on October 11, 1991 by John Koch, Licensed Land Surveyor, of Oakland, California to calculate the differences in groundwater elevations.

Water samples collected for subjective evaluation were collected by gently lowering approximately half the length of a new, disposable bailer past the air-water interface (if possible) and collecting a sample from near the surface of the water in the well. The samples were checked for evidence of free hydrocarbon product.

Before water samples were collected from the groundwater monitoring wells, the wells were purged until stabilization of the temperature, pH, and conductivity was obtained. A minimum of approximately 1 well casing volume of water was purged before these wells were pumped dry. The quantity of water purged from the wells was calculated as follows:

1 well casing volume = $\pi r^2 h(7.48)$ where:
r = radius of the well casing in feet.
h = column of water in the well in feet (well depth - depth to water).
7.48 = conversion constant from cubic feet to gallons.

Gallons of water purged/gallons in 1 well casing volume = well casing volume removed.

After purging, each well was allowed to recharge to at least approximately 80% of the initial water level, unless well recovery was extremely slow. Water samples were then collected with a new, disposable bailer. The water samples were carefully poured into 40-milliliter glass vials, which were filled so as to produce a positive meniscus. Each sample container was preserved with hydrochloric acid, sealed with a cap containing a Teflon® septum, and subsequently examined for air bubbles to avoid headspace which would allow volatilization to occur. The samples were promptly transported in iced storage in a thermally-insulated ice chest, accompanied by a Chain of Custody Record, to a California-certified laboratory. Purged water was removed by a licensed hazardous waste hauler.

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 6041-91-5

Chain of Custody

ARCO Facility no.	6041-60006.03
City (Facility)	DUBLIN
Project manager (Consultant)	JOEL COFFMAN/ LOU LEET
Laboratory name	SEQUOIA
ARCO engineer	CHUCK CARMEL
Telephone no. (ARCO)	
Telephone no. (Consultant)	(408) 264-7723
Fax no. (Consultant)	(408) 264-2435
Contract number	
Consultant name	RESNA
Address (Consultant)	3315 ALMANEN EXPESS WAY, SUITE 34 SAN JOSE, CA

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	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-11-MW1		3		X		X	X		1:45		X											
W-7.8-MW2		3		X		X	X		1:30		X											
W-13-MW3		3		X		X	X		2:10		X											
W-RINSATE		1		X		X	X		1:30		HOLD											

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

Priority Rush 1 Business Day ☐

Rush 2 Business Days ☐

Expedited 5 Business Days ☐

Standard 10 Business Days ☒

Condition of sample:

Temperature received:

Relinquished by sampler	Date	Time	Received by
L. Ju Leet	12-17-91	9:15	Ken Folto
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
APPC-3292 (2-91)

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Joel Coffman

Project: Arco 6041, Dublin

Enclosed are the results from 3 water samples received at Sequoia Analytical on December 17,1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1123208	Water, W-11-MW-1	12/16/91	EPA 5030/8015/8020
1123209	Water, W-9.8-MW-2	12/16/91	EPA 5030/8015/8020
1123210	Water, W-13-MW-3	12/16/91	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Maria Lee

Maria Lee
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RESNA	Client Project ID:	Arco 6041, Dublin	Sampled:	Dec 16, 1991
3315 Almaden Expwy., Suite 34	Matrix Descript:	Water	Received:	Dec 17, 1991
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Dec 19, 1991
Attention: Joel Coffman	First Sample #:	112-3208	Reported:	Dec 31, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
112-3208	W-11-MW-1	840	50	50	3.9	12
112-3209	W-9.8-MW-2	83	0.96	N.D.	N.D.	N.D.
112-3210	W-13-MW-3	1,000	180	5.1	23	4.3
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

1123208.RRR <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Joel Coffman

Client Project ID: Arco 6041, Dublin

QC Sample Group: 112-3208

Reported: Dec 31, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	C. Donohue	C. Donohue	C. Donohue	C. Donohue
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Dec 19, 1991	Dec 19, 1991	Dec 19, 1991	Dec 19, 1991
QC Sample #:	Gblk121991	Gblk121991	Gblk121991	Gblk121991
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.4	9.3	9.4	29
Matrix Spike % Recovery:	94	93	94	97
Conc. Matrix Spike Dup.:	10	10	10	31
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	6.2	7.3	6.2	6.7

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Joel Coffman

Client Project ID: Arco 6041, Dublin

QC Sample Group: 1123209-10

Reported: Dec 31, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	C. Donohue	C. Donohue	C. Donohue	C. Donohue
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Dec 19, 1991	Dec 19, 1991	Dec 19, 1991	Dec 19, 1991
QC Sample #:	Gblk121991	Gblk121991	Gblk121991	Gblk121991
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.2	9.2	9.0	27
Matrix Spike % Recovery:	92	92	90	90
Conc. Matrix Spike Dup.:	8.7	8.7	8.6	26
Matrix Spike Duplicate % Recovery:	87	87	86	87
Relative % Difference:	5.6	5.6	4.5	3.8

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

$$\text{\% Recovery:} = \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} = \frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$$

#1002

MONITORING WELL PURGE WATER DISPOSAL FORM

RECEIVED
JAN 27 1992
RESNA
SAN JOSE

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.	#2010	2110 Old Middlefield @ Rengstorf, Mountain View, CA	224
2.	#6041	7249 Village Parkway @ Amador, Dublin CA	54
3.	#0573	610 Woodside Rd @ Hudson, Redwood City, CA	35
4.	#2130	7906 N. El Dorado St @ Hammer Lane, Stockton, CA	293
5.	#2063	2924 Mc Henry Ave @ Rumble Rd, Modesto, CA	110
6.	#6228	2747 Pinole Valley Rd @ S of Estate Bcat, Pinole, CA	324
7.	#6064	3611 S. Mooney Blvd @ Caldwell, Visalia, CA	113
8.	#2153	2800 Homestead Rd @ Kiely, Santa Clara, CA	106
9.	#0313	3600 Alameda De Las Pulgas @ Avy, Menlo Park, CA	40
10.	#2052	2407 Porter St, Soquel, CA	157

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

KYLE CHRISTIE Kyle Christie by Jon R. Zon 1-22-92
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TRANSPORTER

NAME ALLIED OIL & PUMPING

ADDRESS P.O. BOX 32128

CITY, STATE, ZIP SAN JOSE, CA

PHONE NO (408)432-0333

TRUCK UNIT I.D. NO

ED TAYLOR 1-22-92
TYPED OR PRINTED FULL NAME & SIGNATURE DATE

TSD FACILITY

NAME GIBSON OIL & REFINING

ADDRESS 475 SEAPORT BLVD ☒ RECYCLE ☐ OTHER

CITY, STATE, ZIP REDWOOD CITY, CA 94063

PHONE NO (415)368-5511 RELEASE#11320

GIB REL # GIB-92-009

GAL. 1456

BILL LEON 1-22-92
TYPED OR PRINTED FULL NAME & SIGNATURE DATE