EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

96 DEC 17 AM 9:57

Date December 13, 1996
Project 20805-127.003

To:

Mr. Dale Klettke
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

STID 744

We are enclosing:

Copies	Description
1	Third quarter 1996 groundwater monitoring results for ARCO service station 2111, San Leandro, California
1	First Christian Church letter

For your:		Sent by:	
	X Use		X Regular Mail
	Approval		Standard Air
	Review		Courier
	Information		Other:

Comments:

The enclosed groundwater monitoring report is being sent to you per the request of ARCO Products Company. Please call if you have questions or comments.

John C. Young
Project Manager

cc: Kevin Graves, RWQCB - SFBR
Mike Bakaldin, San Leandro Hazardous Materials Program
Paul Supple, ARCO Products Company
File

ARCO Products Company

Date:
December 12, 1996

Re: ARCO Station #

2111 • 1156 Davis Street • San Leandro, CA
Third Quarter 1996 Groundwater Monitoring Results

"I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached proposal or report are true and correct."

Submitted by:

Paul Supple
Environmental Engineer

EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

December 12, 1996
Project 20805-127.003

Mr. Paul Supple
ARCO Products Company
P.O. Box 6549
Moraga, California 94570

Re: Third quarter 1996 groundwater monitoring program results, ARCO service station 2111, San Leandro, California

Dear Mr. Supple:

This letter presents the results of the third quarter 1996 groundwater monitoring program at ARCO Products Company (ARCO) service station 2111, 1156 Davis Street , San Leandro, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

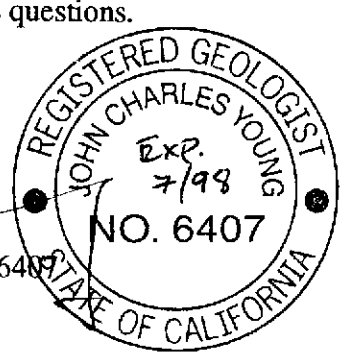
LIMITATIONS

No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the scope, limitations, and cost of work performed during the monitoring event.

Please call if you have questions.

Sincerely,

EMCON



John C. Young, R.G. 6407
Project Manager

EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • **(408) 453-7300** • Fax (408) 437-9526

December 12, 1996
Project 20805-127.003

Reverend Sura D. Phoenix
First Christian Church
1190 Davis Street
San Leandro, California 94577

Re: Third quarter 1996 laboratory analytical results, groundwater samples, First Christian Church, 1190 Davis Street, San Leandro, California

Dear Reverend Phoenix:

Enclosed please find copies of the laboratory analytical results for the groundwater sample collected from well MW-5 during the third quarter of 1996. This well is located at the First Christian Church, 1190 Davis Street, San Leandro, California. The groundwater samples were collected on August 9, 1996, during quarterly sampling of the ARCO Products Company service station 2111, 1156 Davis Street, San Leandro. The laboratory analytical results indicate that the groundwater sample concentrations were not detectable for total petroleum hydrocarbons as gasoline, and the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes.

Please call if you have questions.

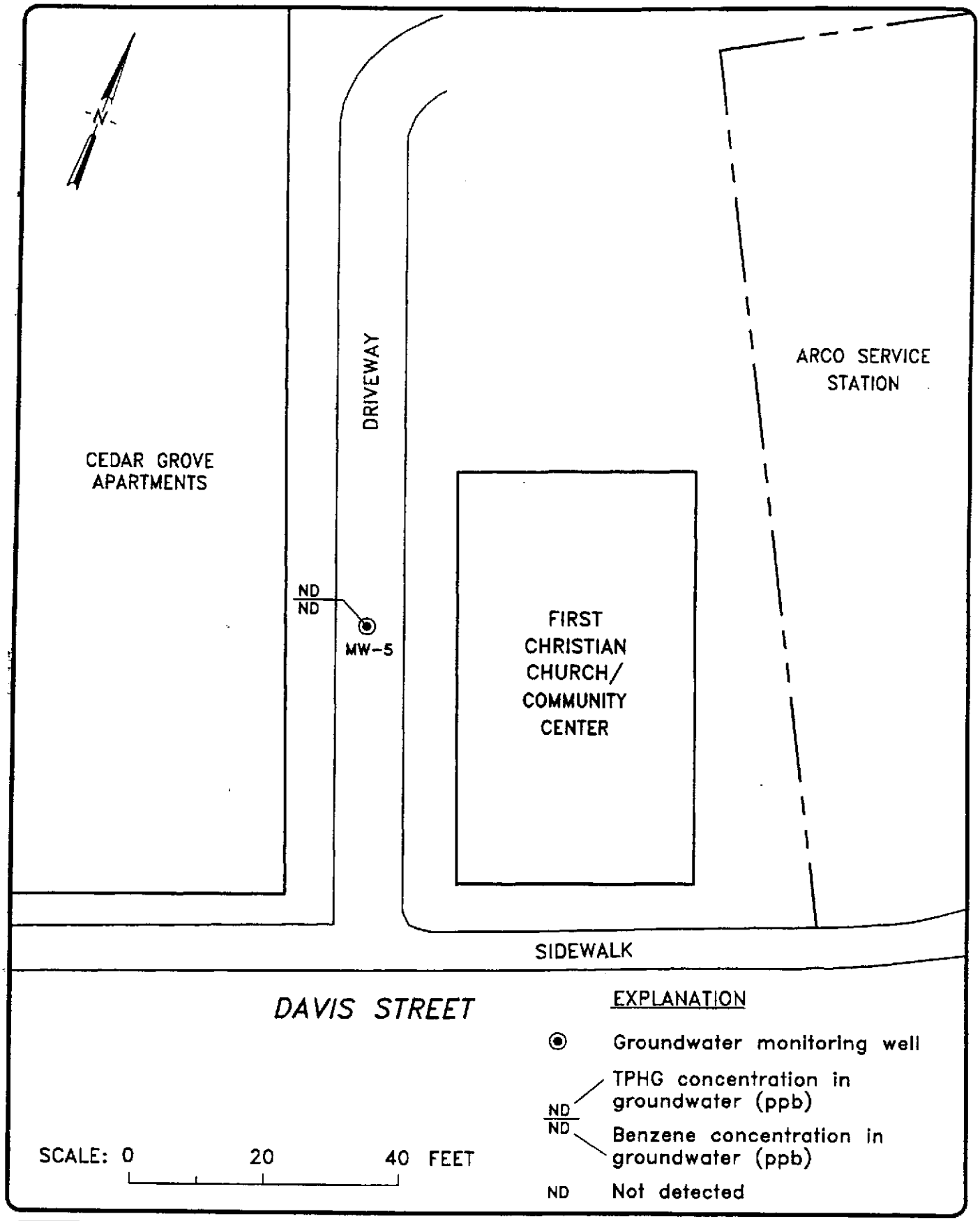
Sincerely,

EMCON

John C. Young
Project Manager

Attachments: Figure 1 - Generalized Site Plan
Attachment A -Copy of Analytical Results and Chain-of-Custody Documentation, Well MW-5, Third Quarter 1996

cc: Dale Klettke, ACHCSA
Kevin Graves, RWQCB - SFBR
Paul Supple, ARCO Products Company
File



EMCON

FIRST CHRISTIAN CHURCH
1190 DAVIS STREET
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

GENERALIZED SITE PLAN

FIGURE
1
PROJECT NO.
805-127.03

ATTACHMENT A

COPY OF ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION, WELL MW-5, THIRD QUARTER 1996

Columbia Analytical Services, Inc.

August 22, 1996

Service Request No.: S9601361

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 2111 SAN LEANDRO/20805-127.003/TO#19350.00

Dear Mr. Young:

Attached are the results of the samples submitted to our lab on August 9, 1996. For you reference, our service request number for this work is S9601361.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 7, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

If you have questions or further needs, please call me at (408) 428-1283.

Sincerely,

Steven L. Green
Project Chemist

SG/sh

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9601361
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:		**MW-5(23)**	**Method Blank**
Lab Code:		S9601361-001	S960813-WB1
Date Analyzed:		8/13/96	8/13/96
Analyte	**MRL**		
TPH as Gasoline	50	ND	ND
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
Methyl *tert*-Butyl Ether	3	8	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: 2111 San Leandro / #20805-127-0032/TO#19350.00
Sample Matrix: Water

Service Request: S9601361
Date Collected: 8/9/96
Date Received: 8/9/96
Date Extracted: NA
Date Analyzed: 8/13/96

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

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α–Trifluorotoluene
MW-5(23)	S9601361-001	103	102
Batch QC (MS)	S9601297-010MS	100	101
Batch QC (DMS)	S9601296-010DMS	99	97
Method Blank	S0960813-WB1	99	98
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9601361
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA
		Date Analyzed:	8/13/96

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S9601276-010

Analyte	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference
Benzene	25	25	0.7	25.9	24.7	101	96	75-135	5
Toluene	25	25	ND	25.6	24.3	102	97	73-136	5
Ethylbenzene	25	25	ND	25.3	24.2	101	97	69-142	4

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: 2111 San Leandro / #20805-127-0032/TO#19350.00

Service Request: S9601361
Date Analyzed: 8/13/96

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.6	102	85-115
Toluene	25	26.1	104	85-115
Ethylbenzene	25	25.6	102	85-115
Xylenes, Total	75	77.2	103	85-115
Gasoline	250	251	100	90-110
Methyl *tert*-Butyl Ether	50	48	96	85-115

ICV25AL/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 19350.00

Chain of Custody

ARCO Facility no. 2111	City (Facility) San Leandro	Project manager (Consultant) John Young	
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 453-0452
Consultant name EMCON		Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131	

Laboratory name: CAS

Contract number:

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 incl. MTBE 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 ☐		
[redacted]		2		X		X	HCL	8/9/94	1027		X											
[redacted]		2		X		X	HCL		1010		X											
[redacted]		4		X		X	HCL		1055		X			X								
MW-5(23')		2		X		X	HCL		0935		X			Report on separate CAR per Guy Inouye, Melody								
[redacted]		2		X		X	HCL		-		X	no samples taken car parked on well.										
[redacted]		2		X		X	HCL		1035		X											
[redacted]		[redacted]		X		X	HCL		1100		X											

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2 - 40ml HCL VOAs All Wells

MW-3 add 2 1 liter NP Glass

#20805-127.003

Lab number: 59601361 ~~9601306~~

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 [signature]	Date 8-9-96	Time 15:00	Received by [signature] Jonne Brown	15:00 8/9/96
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 ~~Lab added HCl to samples~~

APPC-3292 (2-91)

December 12, 1996

ARCO QUARTERLY REPORT

Station No.: 2111	Address: 1156 Davis Street, San Leandro, California
EMCON Project No.	20805-127.003
ARCO Environmental Engineer/Phone No.:	Paul Supple /(510) 299-8891
EMCON Project Manager/Phone No.:	John C. Young /(408) 453-7300
Primary Agency/Regulatory ID No.:	ACHCSA /Dale Klettke Case No. STID 744

WORK PERFORMED THIS QUARTER (Third- 1996):

1. Conducted quarterly groundwater monitoring and sampling for third quarter 1996.
2. Prepared and submitted quarterly monitoring report for second quarter 1996.
3. Prepared and submitted *Soil and Groundwater Assessment Report, ARCO Service Station 2111, San Leandro, California* (EMCON, September 1996).
4. Prepared and submitted *Tier 1, Tier 2, Risk-Based Corrective Action Evaluation for ARCO Service Station 2111, 1156 Davis Street, San Leandro, California* (EMCON, September 1996).

WORK PROPOSED FOR NEXT QUARTER (Fourth- 1996):

1. Perform quarterly groundwater monitoring and sampling for fourth quarter 1996.
2. Submit quarterly report for third quarter 1996.

QUARTERLY MONITORING:

Current Phase of Project:	Quarterly Groundwater Monitoring
Frequency of Sampling:	Quarterly (groundwater)
Frequency of Monitoring:	Quarterly (groundwater)
Is Floating Product (FP) Present On-site:	☐ Yes ☒ No
Bulk Soil Removed to Date :	Unknown
Bulk Soil Removed This Quarter :	None
Water Wells or Surface Waters, within 2000 ft., impacted by site:	None
Current Remediation Techniques:	None
Approximate Depth to Groundwater:	15.60 feet
Groundwater Gradient (Average):	0.01 ft/ft toward west-northwest (consistent with past events)

ATTACHED:

- Table 1 - Groundwater Monitoring Data, Third Quarter 1996
- Table 2 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Figure 1 - Site Location
- Figure 2 - Site Plan
- Figure 3 - Groundwater Data, Third Quarter 1996
- Appendix A - Field Data Sheets, Third Quarter 1996 Groundwater Monitoring Event
- Appendix B - Analytical Results and Chain of Custody Documentation, Third Quarter 1996 Groundwater Monitoring Event

cc: Dale Klettke, ACHCSA
Kevin Graves, RWQCB-SFBR
Mike Bakaldin, San Leandro Hazardous Materials Program

Table 1
Groundwater Monitoring Data
Third Quarter 1996

ARCO Service Station 2111
1156 Davis Street, San Leandro, California

Date: 11-15-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	**TPHG** LUFT Method	**Benzene** EPA 8020	**Toluene** EPA 8020	**Ethylbenzene** EPA 8020	**Total Xylenes** EPA 8020	**MTBE** EPA 8020	**TRPH** EPA 418.1	**TPHD** LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	08-09-96	39.60	17.89	21.71	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	- -	- -
MW-2	08-09-96	37.99	16.10	21.89	ND	WNW	0.01	08-09-96	2800	290	6	75	320	50	- -	- -
MW-3	08-09-96	39.32	17.58	21.74	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	- -
MW-4	08-09-96	38.10	16.10	22.00	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	- -	- -
MW-5	08-09-96	37.21	15.60	21.61	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	8	- -	- -
MW-6	08-09-96	37.11	Not surveyed: Car parked on well					08-09-96	Not sampled: Car parked on well							
MW-7	08-09-96	38.68	15.33	23.35	ND	WNW	0.01	08-09-96	14000	390	<10*	180	470	<200*	- -	- -

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United Statest Environmental Protection Agency
MTBE: methyl-tert-butyl ether
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
ND: none detected
WNW: west-northwest
- - : not available, not analyzed
*: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

esj/h:\2111\2111mdb.xls\Table 1:imi
20805-127.003

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 2111
1156 Davis Street, San Leandro, California

Date: 11-15-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	08-01-95	39.60	17.45	22.15	ND	NR	NR	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-1	12-14-95	39.60	17.09	22.51	ND	W	0.002	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-1	03-21-96	39.60	14.72	24.88	ND	WSW	0.005	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-1	05-24-96	39.60	15.94	23.66	ND	W	0.003	05-24-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-1	08-09-96	39.60	17.89	21.71	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-2	08-01-95	37.99	15.67	22.32	ND	NR	NR	08-01-95	23000	1300	310	500	3500	--	--	--
MW-2	12-14-95	37.99	15.36	22.63	ND	W	0.002	12-14-95	7300	900	25	180	1000	<200*	--	--
MW-2	03-21-96	37.99	12.84	25.15	ND	WSW	0.005	03-21-96	9600	850	30	280	1400	250	--	--
MW-2	05-24-96	37.99	14.03	23.96	ND	W	0.003	05-24-96	2300	300	<5*	73	310	<25*	--	--
MW-2	08-09-96	37.99	16.10	21.89	ND	WNW	0.01	08-09-96	2800	290	6	75	320	50	--	--
MW-3	08-01-95	39.32	17.00	22.32	ND	NR	NR	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	600	76^
MW-3	12-14-95	39.32	16.70	22.62	ND	W	0.002	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	<50
MW-3	03-21-96	39.32	14.17	25.15	ND	WSW	0.005	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	<50
MW-3	05-24-96	39.32	15.30	24.02	ND	W	0.003	05-24-96	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	<50
MW-3	08-09-96	39.32	17.58	21.74	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	--
MW-4	08-01-95	38.10	15.65	22.45	ND	NR	NR	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-4	12-14-95	38.10	15.35	22.75	ND	W	0.002	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-4	03-21-96	38.10	12.74	25.36	ND	WSW	0.005	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-4	05-24-96	38.10	14.03	24.07	ND	W	0.003	05-24-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-4	08-09-96	38.10	16.10	22.00	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-5	03-21-96	37.21	12.60	24.61	ND	WSW	0.005	03-22-96	<50	<0.5	<0.5	<0.5	<0.5	82	--	--
MW-5	05-24-96	37.21	13.71	23.50	ND	W	0.003	05-24-96	<50	<0.5	<0.5	<0.5	<0.5	7	--	--
MW-5	08-09-96	37.21	15.60	21.61	ND	WNW	0.01	08-09-96	<50	<0.5	<0.5	<0.5	<0.5	8	--	--

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents

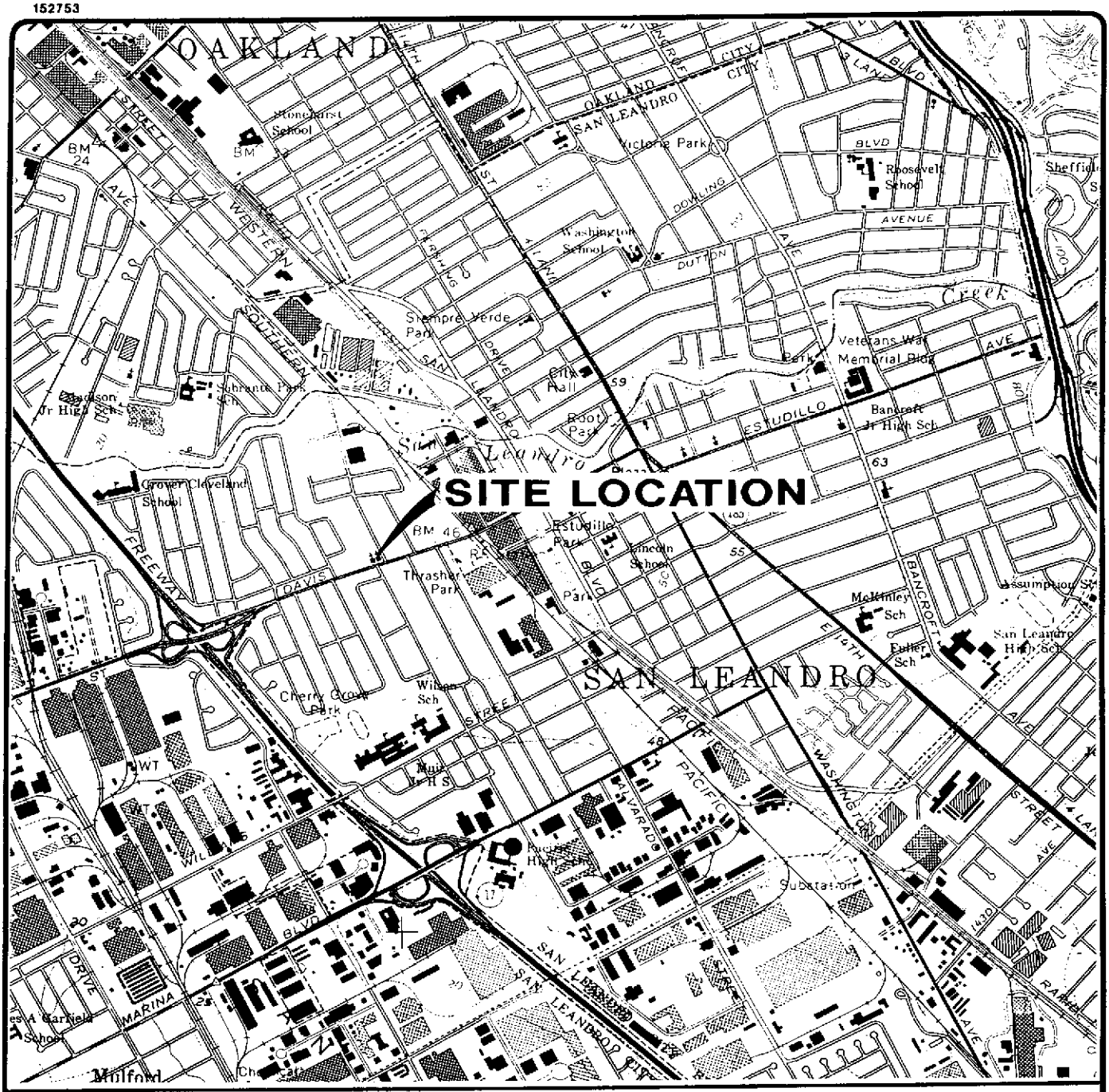
ARCO Service Station 2111
1156 Davis Street, San Leandro, California

Date: 11-15-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	**TPHG** LUFT Method	**Benzene** EPA 8020	**Toluene** EPA 8020	**Ethylbenzene** EPA 8020	**Total Xylenes** EPA 8020	**MTBE** EPA 8020	**TRPH** EPA 418.1	**TPHD** LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-6	03-21-96	37.11	11.55	25.56	ND	WSW	0.005	03-22-96	<50	<0.5	1.9	<0.5	<0.5	<3	--	--
MW-6	05-24-96	37.11	12.80	24.31	ND	W	0.003	05-24-96	<50	<0.5	<0.5	<0.5	<0.5	6	--	--
MW-6	08-09-96	37.11	Not surveyed: Car parked on well					08-09-96	Not sampled: Car parked on well							
MW-7	03-21-96	38.68	13.32	25.36	ND	WSW	0.005	03-22-96	32000	870	450	970	4900	280	--	--
MW-7	05-24-96	38.68	14.58	24.10	ND	W	0.003	05-24-96	22000	570	40	42	1900	<200*	--	--
MW-7	08-09-96	38.68	15.33	23.35	ND	WNW	0.01	08-09-96	14000	390	<10*	180	470	<200*	--	--

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United States Environmental Protection Agency
MTBE: Methyl-tert-butyl ether
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel. California DHS LUFT Method
NR: not reported; data not available or not measurable
ND: none detected
W: west
WSW: west-southwest
NW: northwest
WNW: west-northwest
^: chromatogram fingerprint is not characteristic of diesel
*: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference
- -: not available

152753

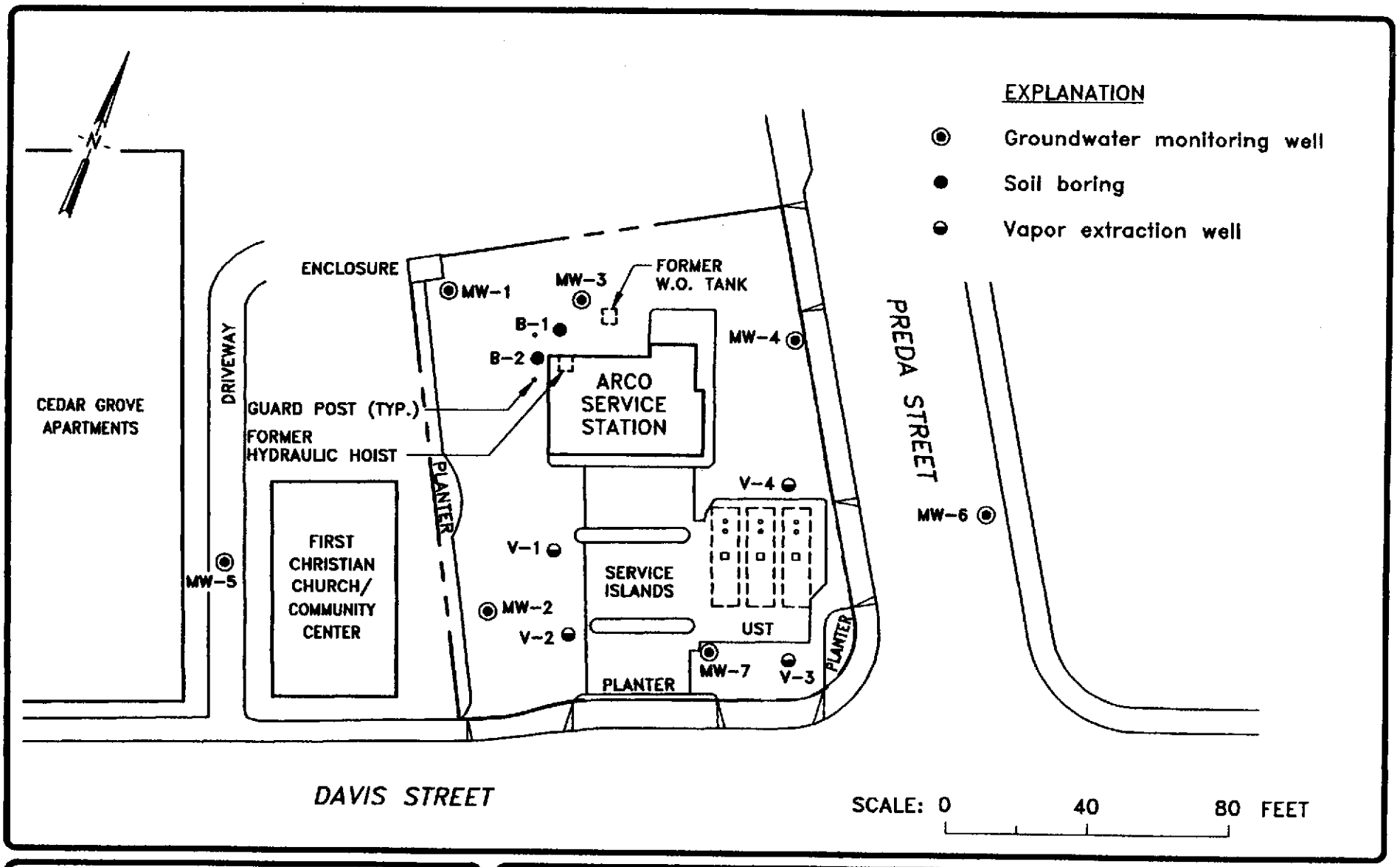


EMCON

ARCO PRODUCTS COMPANY
SERVICE STATION 2111, 1156 DAVIS STREET
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

SITE LOCATION

FIGURE
1
PROJECT NO.
805-127.03



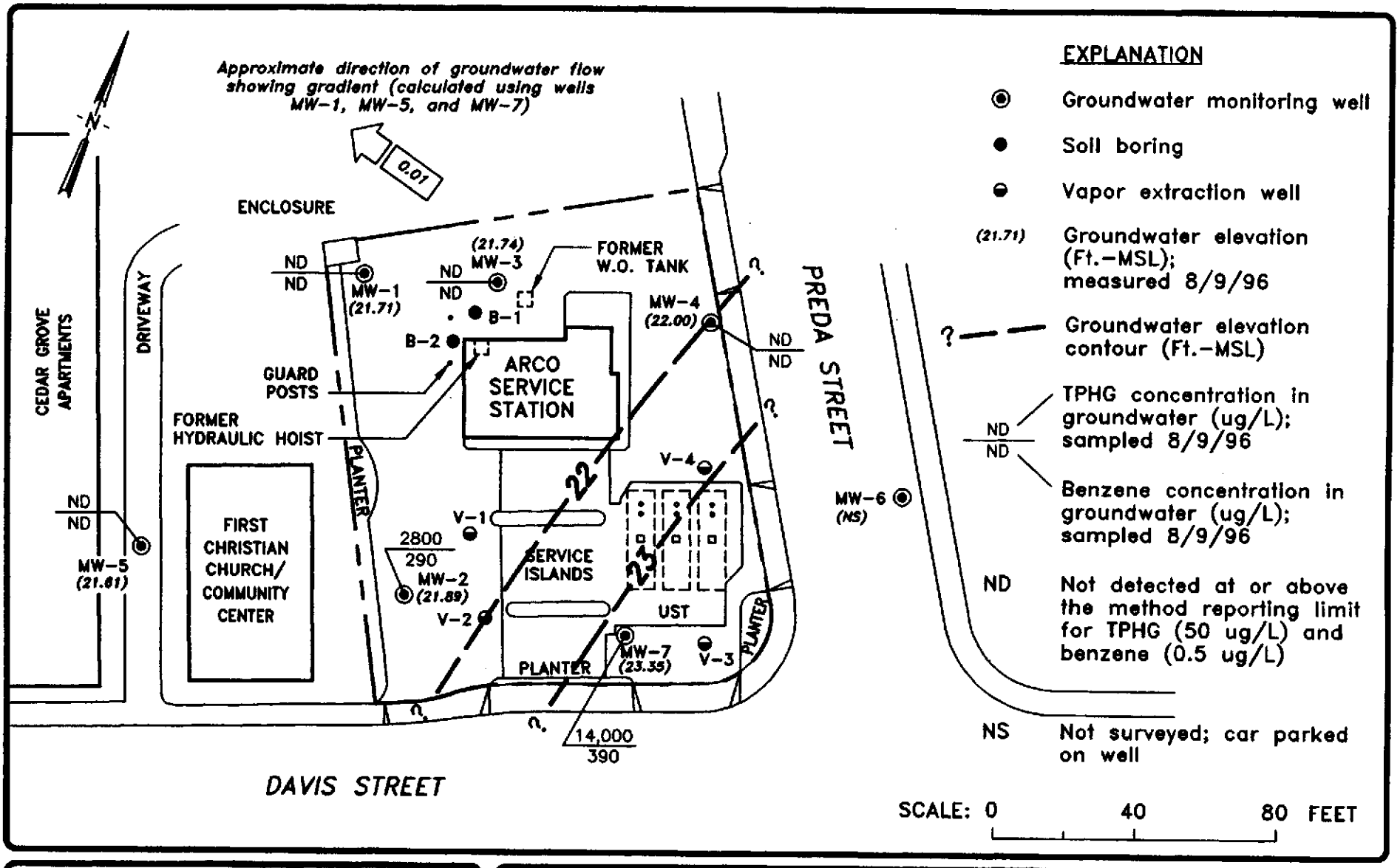
EMCON

ARCO PRODUCTS COMPANY
SERVICE STATION 2111, 1156 DAVIS STREET
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

SITE PLAN

FIGURE
2
PROJECT NO.
805-127.03

G:\805-127\G00-NEW REV 0 09/17/96 11:40:48 KAJ DJ



emcon

ARCO PRODUCTS COMPANY
SERVICE STATION 2111, 1156 DAVIS STREET
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

GROUNDWATER DATA
THIRD QUARTER 1996

FIGURE
3
PROJECT NO.
805-127.003

APPENDIX A

FIELD DATA SHEETS, THIRD QUARTER 1996 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : **21775-226.002** STATION ADDRESS : **1156 Davis Street, San Leandro** DATE : 8-9-96

ARCO STATION # : **2111** FIELD TECHNICIAN : M. Gallegos DAY : Friday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket Present	Lock Number	Type Of Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	**MW-1**	Good	Good	Yes	3490	Loc.	17.89	17.89	ND	NA	26.2	
2	**MW-4**				3490		16.10	16.10			21.6	
3	**MW-3**				3490		17.58	17.58			26.7	
4	**MW-5**				3616		15.60	15.60			23.9	
5	**MW-6**				3490		Cap	—			—	Cap on top of well
6	**MW-2**				3490		16.10	16.10			26.6	
7	**MW-7**	↓	↓	↓	Dolphin	↓	15.33	15.33	↓	↓	27.1	**Please replace lock w/ 3490**

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

(26)

EMCON ASSOCIATES

PROJECT NO: 21775-226-002 SAMPLE ID: MW-1

PURGED BY: J WILLIAMS CLIENT NAME: ARCO 2111

SAMPLED BY: L LOCATION: SAN LEANDRO, CA

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

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

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 5.4

DEPTH TO WATER (feet): 17.89 CALCULATED PURGE (gal.): 16.28

DEPTH OF WELL (feet): 26.2 ACTUAL PURGE VOL. (gal.): 16.5

DATE PURGED: 08-09-96 Start (2400 Hr) 1017 End (2400 Hr) 1027

DATE SAMPLED: L Start (2400 Hr) ___ End (2400 Hr) 1077

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1019	5.5	6.44	719	75.5	CLEAR	TRACE
1021	11	6.36	735	70.1	L	L
1022	16.5	6.46	740	70.0	L	L

D. O. (ppm): NA ODOR: None

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

COLOR (COBALT 0 - 500): NA

TURBIDITY (NTU 0 - 200 or 0 - 1000): NA

PURGING EQUIPMENT

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: OK LOCK #: 5490

REMARKS: ___

Meter Calibration: Date: 8-9-96 Time: 0952 Meter Serial #: ___ Temperature °F: 73.4

(EC 1000 1004 / 1000) (DI ___) (pH 7 7.12 / 7.00) (pH 10 10.02 / 10.00) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 1 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21775-226-GO2 SAMPLE ID: MW-2 (26')

PURGED BY: M. Gallegos CLIENT NAME: PRIDE 211

SAMPLED BY: " LOCATION: San Leandro, 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): N/A VOLUME IN CASING (gal.): 6.86

DEPTH TO WATER (feet): 16.10 CALCULATED PURGE (gal.): 20.58

DEPTH OF WELL (feet): 26.6 ACTUAL PURGE VOL. (gal.): 21.0

DATE PURGED: 8-5-96 Start (2400 Hr) 1023 End (2400 Hr) 1029

DATE SAMPLED: " Start (2400 Hr) 1035 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1025	7.0	6.87	720	72.9	clear	1,2+
1027	14.0	6.77	702	70.1	"	clear
1029	21.0	6.71	697	70.1	"	"

D. O. (ppm): N/A ODOR: none N/A (COBALT 0 - 500) N/A (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: N/A

Parameters field filtered at this well: N/A

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good LOCK #: 3450

REMARKS: Oil Sample taken

Meter Calibration: Date: 8-5-96 Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: [signature] Page 2 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

(26)

EMCON ASSOCIATES

PROJECT NO: 2775-126-002 SAMPLE ID: MW-3

PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 2111

SAMPLED BY: L LOCATION: SAN LEANDRO CA

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

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

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 5.95

DEPTH TO WATER (feet): 17.59 CALCULATED PURGE (gal.): 17.87

DEPTH OF WELL (feet): 26.7 ACTUAL PURGE VOL. (gal.): 18

DATE PURGED: 08-09-96 Start (2400 Hr) 1040 End (2400 Hr) 1046

DATE SAMPLED: L Start (2400 Hr) — End (2400 Hr) 1055

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1043	6	6.55	7.63	70.2	BROWN	MOD
1045	12	6.54	7.64	70.3	CLEAR	TRACE
1046	18	6.50	7.67	70.3	L	L

D. O. (ppm): NA ODOR: ___ NA (COBALT 0 - 500) NA (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
✓ 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: OK LOCK #: ___

REMARKS: ___

Meter Calibration: Date: 8-9-96 Time: 0952 Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 3 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 2175-226-002 SAMPLE ID: MW-4 (21')

PURGED BY: M. Gallegos CLIENT NAME: Arco #211

SAMPLED BY: ↓ LOCATION: San Leandro, 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):	N/A	VOLUME IN CASING (gal.):	3.59
DEPTH TO WATER (feet):	16.10	CALCULATED PURGE (gal.):	10.78
DEPTH OF WELL (feet):	21.6	ACTUAL PURGE VOL. (gal.):	11.0

DATE PURGED: 8-9-96 Start (2400 Hr) 0955 End (2400 Hr) 1004

DATE SAMPLED: ↓ Start (2400 Hr) 1010 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
0955	3.5	6.86	1306	73.8	THN	MOD
1001	7.0	6.64	801	71.7	↓	↓
1004	11.0	6.60	798	71.0	↓	↓

D. O. (ppm): N/R ODOR: None N/R N/R

(COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: N/R

Parameters field filtered at this well: N/R

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: Good LOCK #: 3450

REMARKS: Oil Sample taken

Meter Calibration: Date: 8/5/96 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: [signature] Page 4 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-226-002 SAMPLE ID: MW-5 (23')

PURGED BY: M. GALLEGOS CLIENT NAME: ARCO 2111

SAMPLED BY: V LOCATION: San Leandro, CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	1.35
DEPTH TO WATER (feet):	15.60	CALCULATED PURGE (gal.):	4.06
DEPTH OF WELL (feet):	23.9	ACTUAL PURGE VOL. (gal.):	4.5

DATE PURGED: 8-9-96 Start (2400 Hr) 0925 End (2400 Hr) 0932

DATE SAMPLED: V Start (2400 Hr) 0925 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
0927	1.5	6.34	711	69.4	BRN	HEAVY
0929	3.0	6.56	706	68.6		
0932	4.5	6.62	701	68.2		

D. O. (ppm): NR ODOR: none

COLOR (visual): NR (COBALT 0 - 500)

TURBIDITY (visual): NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

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

WELL INTEGRITY: Good LOCK #: 3490

REMARKS: oil Sample taken

Meter Calibration: Date: 8-9-96 Time: 0923 Meter Serial #: 9204 Temperature °F: 69.5

(EC 1000 944 / 1000) (DI ___) (pH 7 700 / 700) (pH 10 1000 / 1000) (pH 4 400 / 400)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 5 of 7

Rev. 3. 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21775-276.002 SAMPLE ID: MW-6( )

PURGED BY: Joe William CLIENT NAME: ARCC #2111

SAMPLED BY: ↓ LOCATION: San Leandro CA

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

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

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

DEPTH TO WATER (feet): ___ CALCULATED PURGE (gal.): ___

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

DATE PURGED: 8/19/96 Start (2400 Hr) ___ End (2400 Hr) ___

DATE SAMPLED: ↓ Start (2400 Hr) ___ End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
		No Sample				
		Car On Well				

D. O. (ppm): ___ ODOR: ___

Field QC samples collected at this well: ___

Parameters field filtered at this well: ___

(COBALT 0 - 500) (NTU 0 - 200 or 0 - 1000)

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: ___ LOCK #: ___

REMARKS: ___

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

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

Location of previous calibration: ___

Signature: [signature] for Well Reviewed By: [signature] Page 6 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 21775-2R6.002 SAMPLE ID: MW-7(27')

PURGED BY: M. Ballegeo CLIENT NAME: ARCO #2111

SAMPLED BY: ✓ LOCATION: San Leandro, 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): NA VOLUME IN CASING (gal.): 7.6.8

DEPTH TO WATER (feet): 15.33 CALCULATED PURGE (gal.): 23.06

DEPTH OF WELL (feet): 27.1 ACTUAL PURGE VOL. (gal.): 9.0

DATE PURGED: 8-9-94 Start (2400 Hr) 1052 End (2400 Hr) 1055

DATE SAMPLED: ✓ Start (2400 Hr) 1100 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1055	8.0	6.50	1098	72.2	Tan	mod
	~~10~~ well dried up			9.0	Sediments	
1102	Discharge	6.49	1003	72.0	Brn	Heavy

D. O. (ppm): NR ODOR: Strong ✓

NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NC

Parameters field filtered at this well: NR

PURGING EQUIPMENT

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: Good LOCK #: 3490

REMARKS: Cell Sample Taken

Meter Calibration: Date: 8/9/94 Time: ___ Meter Serial #: 92041 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: [signature] Page 7 of 7

APPENDIX B

ANALYTICAL RESULTS AND CHAIN OF CUSTODY DOCUMENTATION, THIRD QUARTER 1996 GROUNDWATER MONITORING EVENT

Columbia Analytical Services inc.

August 22, 1996 Service Request No.: S9601306

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 2111 SAN LEANDRO/20805-127.0032/TO#19350.00

Dear Mr. Young:

Attached are the results of the samples submitted to our lab on August 9, 1996. For you reference, our service request number for this work is S9601306.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 12, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

If you have questions or further needs, please call me at (408) 428-1283.

Sincerely,

Steven L. Green
Project Chemist

SG/sh

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	L9603478
Project:	2111 SAN LEANDRO/#20805-127.0032/TO# 19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	8/13/96
		Date Analyzed:	8/13/96

Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Method 418.1
Units: mg/L (ppm)

Sample Name	Lab Code	MRL	Result
MW-3 (26)	L9603478-001	0.5	ND
Method Blank	L9603478-MB	0.5	ND

1AMRL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9601306
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

	Sample Name:	**MW-1 (26)**	**MW-4 (21)**	**MW-3 (26)**
	Lab Code:	S9601306-001	S9601306-002	S9601306-003
	Date Analyzed:	8/13/96	8/13/96	8/13/96
Analyte	**MRL**			
TPH as Gasoline	50	ND	ND	ND
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
Methyl *tert*-Butyl Ether	3	ND	ND	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9601306
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

		Sample Name:	**MW-2 (26)**	**MW-7 (27)**	**Method Blank**
		Lab Code:	S9601306-005	S9601306-006	S060813-WB1
		Date Analyzed:	8/14/96	8/14/96	8/13/96
Analyte	**MRL**				
TPH as Gasoline	50		2,800	14,000	ND
Benzene	0.5		290	390	ND
Toluene	0.5		6.0	<10*	ND
Ethylbenzene	0.5		75	180	ND
Total Xylenes	0.5		320	470	ND
Methyl *tert*-Butyl Ether	3		50	<200**	ND

* Raised MRL due to high analyte concentration requiring sample dilution.
** Raised MRL due to matrix interference.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9601306
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	**Method Blank**
Lab Code:	S060814-WB1
Date Analyzed:	8/14/96

Analyte	**MRL**	
TPH as Gasoline	50	ND
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	0.5	ND
Methyl *tert*-Butyl Ether	3	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	L9603478
Project:	2111 SAN LEANDRO/#20805-127.0032/TO# 19350.00	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	8/13/96
		Date Analyzed:	8/13/96

Matrix Spike/Duplicate Matrix Spike Summary
Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Method 418.1
Units: mg/L (ppm)

Sample Name: BATCH QC
Lab Code: L9603423-045

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
TRPH	1.90	1.90	ND	1.74	1.74	92	92	45-155	<1

DMS1S/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	L9603478
Project:	2111 SAN LEANDRO/#20805-127.0032/TO# 19350.00	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	8/13/96
		Date Analyzed:	8/13/96

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary
Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Method 418.1
Units: mg/L (ppm)

	True Value		Result		Percent Recovery			
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	CAS Acceptance Limits	**Relative Percent Difference**
TRPH	1.99	1.99	1.79	1.72	90	86	75-125	4

DLCS/032395

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9601306
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA
		Date Analyzed:	8/13-14/96

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

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α–Trifluorotoluene
MW-1 (26)	S9601306-001	101	99
MW-4 (21)	S9601306-002	99	102
MW-3 (26)	S9601306-003	101	102
MW-2 (26)	S9601306-005	100	108
MW-7 (27)	S9601306-006	96	107*
Batch QC (MS)	S9601276-010MS	100	101
Batch QC (DMS)	S9601276-010DMS	99	97
Method Blank	S960813-WB1	99	98
Method Blank	S960814-WB1	99	99
CAS Acceptance Limits:		69-116	69-116

* The surrogate used for this sample was 4-Bromofluorobenzene.

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9601306
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA
		Date Analyzed:	8/13/96

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S0601276-010

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Benzene	25	25	0.7	25.9	24.7	101	96	75-135	5
Toluene	25	25	ND	25.6	24.3	102	97	73-136	5
Ethylbenzene	25	25	ND	25.3	24.2	101	97	69-142	4

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9601306
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Analyzed:**	8/13/96

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.6	102	85-115
Toluene	25	26.1	104	85-115
Ethylbenzene	25	25.6	102	85-115
Xylenes, Total	75	77.2	103	85-115
Gasoline	250	251	100	90-110
Methyl *tert*-Butyl Ether	50	48	96	85-115

ARCO Products Company Division of AtlanticRichfieldCompany

Task Order No. 19350.CC

Chain of Custody

ARCO Facility no.	2111
City (Facility)	San Leandro
Project manager (Consultant)	John Young
ARCO engineer	Mike Whelan
Telephone no. (ARCO)	
Telephone no. (Consultant)	(408) 453-7300
Fax no. (Consultant)	(408) 453 0452
Consultant name	EMCON
Address (Consultant)	1921 Ringwood Ave. San Jose CA 95131
Laboratory name	CAS
Contract number	
Method of shipment	Sampler will deliver
Special detection Limit/reporting	Lowest Possible
Special QA/QC	As Normal
Remarks	2 - 40ml HCL VOAs All Wells. MW-3 add 2 Liter NP Glass #20805-197.CC3
Lab number	S9601306

	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 ☐		
1	MW-1 (26')		2		X		X	HCL	8/9/96	1027		X											
2	MW-4 (21')		2		X		X	HCL	↓	1010		X											
3	MW-3 (26')		4		X		X	HCL		1055		X			X								
4	MW-5 (23')		2		X		X	HCL		0935		X			Report on separate CAR per Ivy Inouye								
~~8~~	MW-6 ( )		2		X		X	HCL	–	–		X	no samples taken car parked over well										
5	MW-7 (26')		2		X		X	HCL		1035		X											
6	MW-7 (27')		2		X		X	HCL	↓	1100		X											

8/9/96

Condition of sample:		Temperature received:	
Relinquished by sampler [signature]	Date 8-9-96 Time 15:00	Received by Joanne Brown	15:00 8/9/96
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

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

APPC-3292 (2-91)

S Lab added HCl to samples * for 418.1

Columbia Analytical Services INC.

August 22, 1996 Service Request No.: S9601361

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 2111 SAN LEANDRO/20805-127.003/TO#19350.00

Dear Mr. Young:

Attached are the results of the samples submitted to our lab on August 9, 1996. For you reference, our service request number for this work is S9601361.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 7, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

If you have questions or further needs, please call me at (408) 428-1283.

Sincerely,

Steven L. Green
Project Chemist

SG/sh

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. The highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9601361
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:		**MW-5(23)**	**Method Blank**
Lab Code:		S9601361-001	S960813-WB1
Date Analyzed:		8/13/96	8/13/96
Analyte	**MRL**		
TPH as Gasoline	50	ND	ND
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
Methyl *tert*-Butyl Ether	3	8	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9601361
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA
		Date Analyzed:	8/13/96

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

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α–Trifluorotoluene
MW-5(23)	S9601361-001	103	102
Batch QC (MS)	S9601297-010MS	100	101
Batch QC (DMS)	S9601296-010DMS	99	97
Method Blank	S0960813-WB1	99	98
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9601361
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Collected:**	8/9/96
Sample Matrix:	Water	**Date Received:**	8/9/96
		Date Extracted:	NA
		Date Analyzed:	8/13/96

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S9601276-010

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Benzene	25	25	0.7	25.9	24.7	101	96	75-135	5
Toluene	25	25	ND	25.6	24.3	102	97	73-136	5
Ethylbenzene	25	25	ND	25.3	24.2	101	97	69-142	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9601361
Project:	2111 San Leandro / #20805-127-0032/TO#19350.00	**Date Analyzed:**	8/13/96

Initial Calibration Verification (ICV) Summary
BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.6	102	85-115
Toluene	25	26.1	104	85-115
Ethylbenzene	25	25.6	102	85-115
Xylenes, Total	75	77.2	103	85-115
Gasoline	250	251	100	90-110
Methyl *tert* -Butyl Ether	50	48	96	85-115

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 19350.00

Chain of Custody

ARCO Facility no. 2111	City (Facility) San Leandro	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131		Contract number

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 incl. MTBE 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 ☐		
1 ~~MW-1(26')~~		~~2~~		X		X	HCL	8/9/96	1027		X											
2 ~~MW-4(21')~~		~~2~~		X		X	HCL	↓	1010		X											
3 ~~MW-3(20')~~		~~4~~		X		X	HCL		1055		X			X								
4 MW-5(23')		2		X		X	HCL		0935		X		Report on separate CAR per Ivy Inouye, Mgr									
~~MW-6( )~~		2		X		X	HCL	-	-		X	no samples taken car parked on well.										
5 ~~MW-2(20')~~		2		X		X	HCL		1035		X											
6 ~~MW-7(27')~~		~~2~~		X		X	HCL	↓	1100		X											

4/96

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2 - 40ml HCL VOAs All Wells

MW-3 add 2 1 liter NP Glass

#20805-127.003

Lab number: 9608136 ~~9608136~~

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		
[signature]	8-9-96	15:00	Joanne Brown	15:00	8/9/96
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 ~~3 Lab added HCl to samples~~

APPC-3292 (2-91)