



EMCON

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

CALIFORNIA ENVIRONMENTAL PROTECTION

97 MAR 24 PM 4: 00 Date March 21, 1997
Project 20805-127.003

To:

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

744

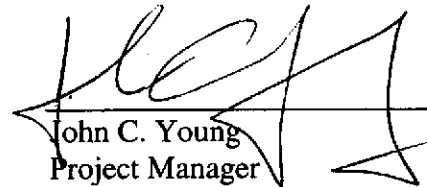
We are enclosing:

Copies	Description
<u>1</u>	<u>Fourth quarter 1996 groundwater monitoring results</u> <u>for ARCO service station 2111, San Leandro, California</u>
<u>1</u>	<u>First Christian Church letter</u>

For your:	<u> X </u>	Use	Sent by:	<u> X </u>	Regular Mail
	<u> </u>	Approval		<u> </u>	Standard Air
	<u> </u>	Review		<u> </u>	Courier
	<u> </u>	Information		<u> </u>	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





Date: March 14, 1997

Re: ARCO Station #

2111 • 1156 Davis Street • San Leandro, CA
Fourth 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:

A handwritten signature in cursive script that reads "Paul Supple".

Paul Supple
Environmental Engineer



EMCON

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

March 19, 1997
Project 20805-116.008

STO # 744

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

*Arco
1156 Davis St
San Leandro, California*

Re: Purge or non-purge sampling procedures

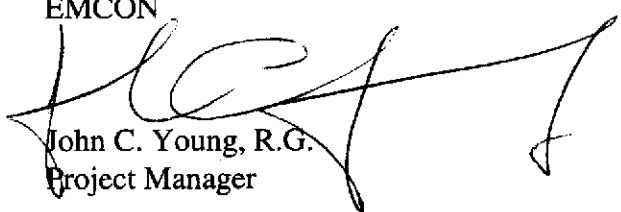
Dear Mr. Tinsley:

On behalf of ARCO, EMCON has prepared this letter to inform you that we will be sampling wells at ARCO Station 2111 in San Leandro, California, per the requirements set forth in the San Francisco Bay Regional Water Quality Control Board's letter dated January 31, 1997, regarding utilization of non-purge approach for sampling of monitoring wells impacted by petroleum hydrocarbons, BTEX and MTBE. EMCON will gauge depth to water in each well before sampling to ensure the RWQCB's procedures are met.

If you have questions on the sampling procedures, please call.

Sincerely,

EMCON


John C. Young, R.G.
Project Manager

cc: Paul Supple, ARCO

EMCON





EMCON

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

March 19, 1997
Project 20805-127.003

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

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

Dear Mr. Supple:

This letter presents the results of the fourth 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.

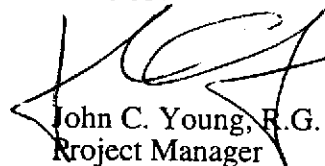
LIMITATIONS

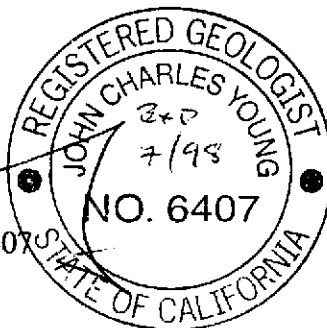
No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site,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



March 19, 1997

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 /Kevin Tinsley Case No. STID 744

WORK PERFORMED THIS QUARTER (Fourth- 1996):

1. Conducted quarterly groundwater monitoring and sampling for fourth quarter 1996.
2. Prepared and submitted quarterly monitoring report for third quarter 1996.

WORK PROPOSED FOR NEXT QUARTER (First- 1997):

1. Perform quarterly groundwater monitoring and sampling for first quarter 1997.
2. Submit quarterly report for fourth 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: 17.00 feet
Groundwater Gradient (Average): 0.007 ft/ft toward west-northwest (consistent with past events)

ATTACHED:

- Table 1 - Groundwater Monitoring Data, Fourth 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, Fourth Quarter 1996
- Appendix A - Analytical Results and Chain of Custody Documentation, Fourth Quarter 1996 Groundwater Monitoring Event

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

emcon

Table 1
Groundwater Monitoring Data
Fourth Quarter 1996

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

Date: 02-06-97

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
MW-1	11-06-96	39.60	18.66	20.94	ND	WNW	0.007	11-06-96	<50	<0.5	<0.5	<0.5	<0.5	△3	--	--
MW-2	11-06-96	37.99	16.98	21.01	ND	WNW	0.007	11-06-96	750	76	<1*	15	51	110	--	--
MW-3	11-06-96	39.32	18.33	20.99	ND	WNW	0.007	11-06-96	<50	<0.5	<0.5	<0.5	<0.5	△3	--	--
MW-4	11-06-96	38.10	17.00	21.10	ND	WNW	0.007	11-06-96	<50	<0.5	<0.5	<0.5	<0.5	△3	--	--
MW-5	11-06-96	37.21	16.36	20.85	ND	WNW	0.007	11-06-96	<50	<0.5	<0.5	<0.5	<0.5	100	--	--
MW-6	11-06-96	37.11	Not surveyed: Car parked on well			WNW	0.007	11-06-96	Not surveyed: Car parked on well							
MW-7	11-06-96	38.68	16.95	21.73	ND	WNW	0.007	11-06-96	9500	440	<10*	210	150	<100*	--	--

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

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

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

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

Date: 02-06-97

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	Δ	--	--
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	Δ	--	--
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	Δ	--	--
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	Δ	--	--
MW-1	11-06-96	39.60	18.66	20.94	ND	WNW	0.007	11-06-96	<50	<0.5	<0.5	<0.5	<0.5	Δ	--	--
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-2	11-06-96	37.99	16.98	21.01	ND	WNW	0.007	11-06-96	750	76	<1*	15	51	110	--	--
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	Δ	<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	Δ	<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	Δ	<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	Δ	<500	--
MW-3	11-06-96	39.32	18.33	20.99	ND	WNW	0.007	11-06-96	<50	<0.5	<0.5	<0.5	<0.5	Δ	--	--

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

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

Date: 02-06-97

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	TPHC 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-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-4	11-06-96	38.10	17.00	21.10	ND	WNW	0.007	11-06-96	<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	--	--	
MW-5	11-06-96	37.21	16.36	20.85	ND	WNW	0.007	11-06-96	<50	<0.5	<0.5	<0.5	<0.5	100	--	--	
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-6	11-06-96	37.11	Not surveyed: Car parked on well			WNW	0.007	11-06-96	Not surveyed: 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*	--	--	
MW-7	11-06-96	38.68	16.95	21.73	ND	WNW	0.007	11-06-96	9500	440	<10*	210	150	<100*	--	--	

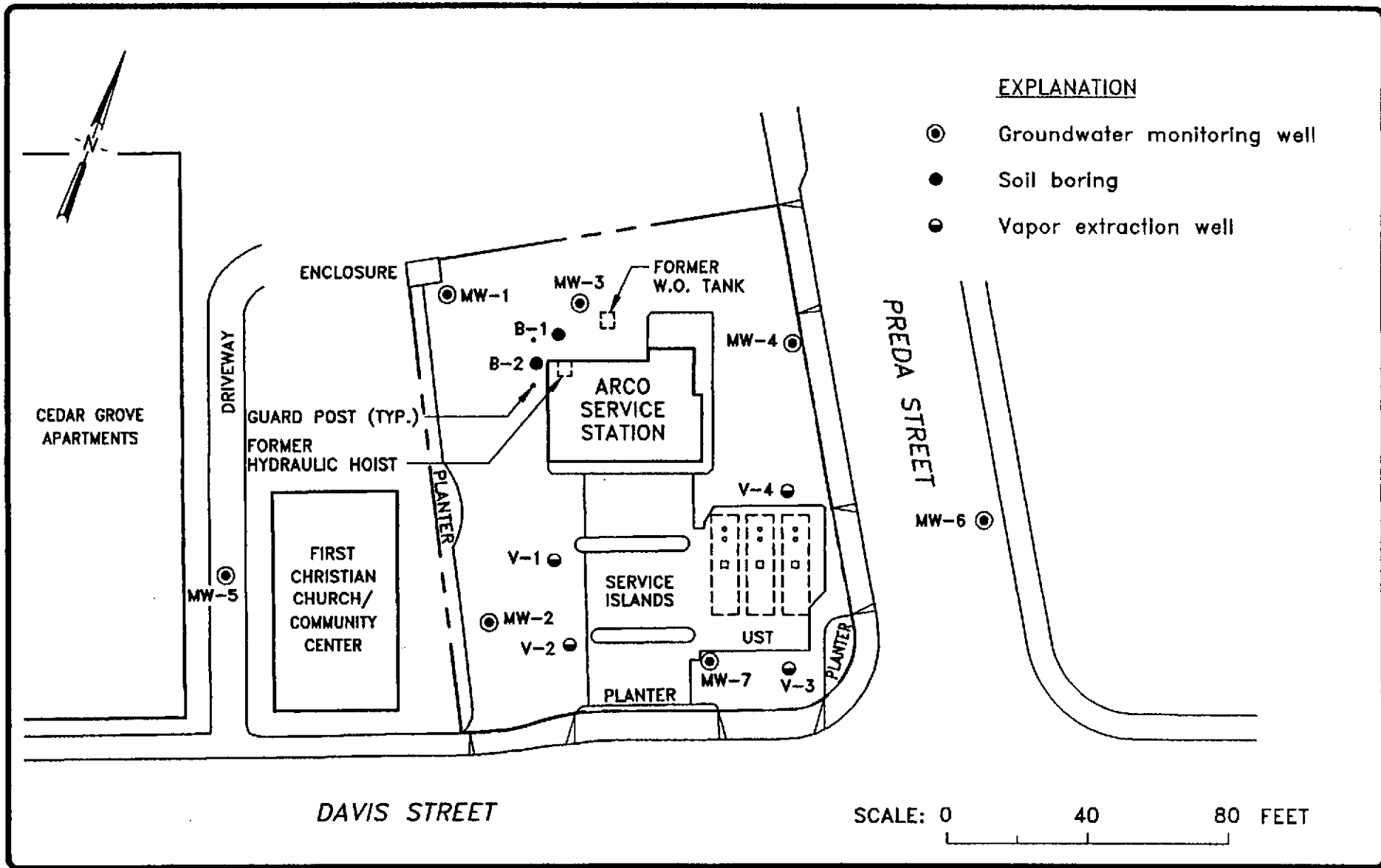
Table 2
 Historical Groundwater Elevation and Analytical Data
 Petroleum Hydrocarbons and Their Constituents

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

Date: 02-06-97

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
------------------	---------------------------	--------------------------------------	------------------------	------------------------------------	---------------------------------------	--------------------------------------	--------------------------------	----------------------------	-----------------------------	-----------------------------	-----------------------------	----------------------------------	-----------------------------------	--------------------------	---------------------------	-----------------------------

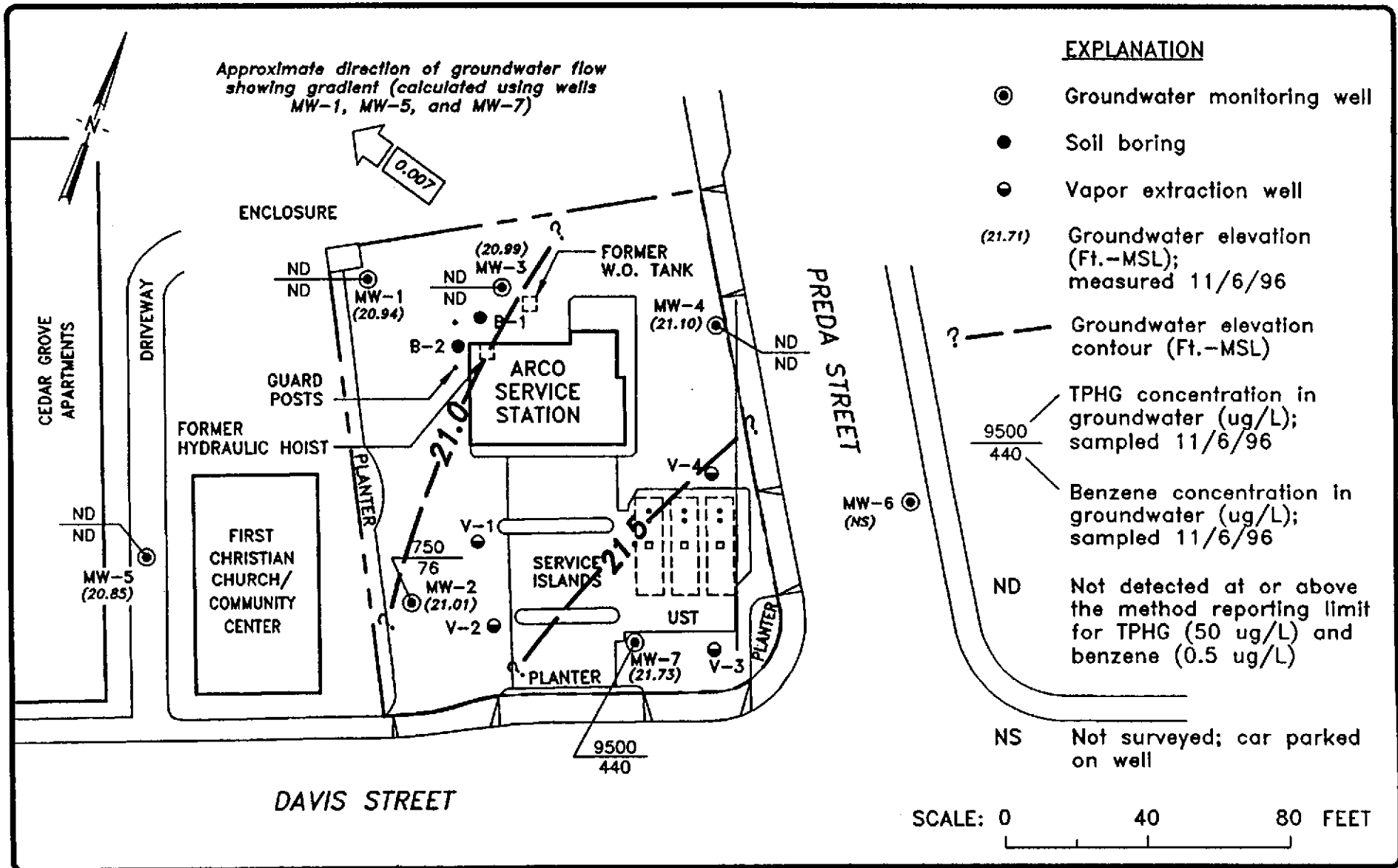
ft-MSL: elevation in feet, relative to mean sea level
 MWN: ground-water flow direction and gradient apply to the entire monitoring well network
 ft/ft: foot per foot
 TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
 µg/L: micrograms per liter
 EPA: United States Environmental 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



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

SITE PLAN

FIGURE
2
 PROJECT NO.
 805-127.03



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

GROUNDWATER DATA
 FOURTH QUARTER 1996

FIGURE
3
 PROJECT NO.
 805-127.003

APPENDIX A

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

**Columbia
Analytical
Services^{INC.}**

November 19, 1996

Service Request No.: S9601853

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

RE: 2111 San Leandro/20805-127.002/TO#19350.00

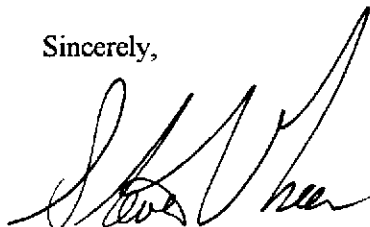
Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on November 6, 1996. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

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 9, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,



Steven L. Green
Project Chemist

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
TTLIC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#19350.00
Sample Matrix: Water

Service Request: S9601853
Date Collected: 11/6/96
Date Received: 11/6/96
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:	S9601853-001	S9601853-002	S9601853-003
Date Analyzed:	11/14/96	11/14/96	11/14/96

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 <i>tert</i> -Butyl Ether	3	ND	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#19350.00
Sample Matrix: Water

Service Request: S9601853
Date Collected: 11/6/96
Date Received: 11/6/96
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)	M-7 (27)	Method Blank
Lab Code:	S9601853-004	S9601853-005	S961114-WB1
Date Analyzed:	11/15/96	11/15/96	11/14/96

Analyte	MRL			
TPH as Gasoline	50	750	9,500	ND
Benzene	0.5	76	440	ND
Toluene	0.5	<1 C	<10 C	ND
Ethylbenzene	0.5	15	210	ND
Total Xylenes	0.5	51	150	ND
Methyl <i>tert</i> -Butyl Ether	3	110	<100 C	ND

C The MRL is elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#19350.00
Sample Matrix: Water

Service Request: S9601853
Date Collected: 11/6/96
Date Received: 11/6/96
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: S961115-WB1
Date Analyzed: 11/15/96

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 <i>tert</i> -Butyl Ether	3	ND

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#19350.00
Sample Matrix: Water

Service Request: S9601853
Date Collected: 11/6/96
Date Received: 11/6/96
Date Extracted: NA
Date Analyzed: NA

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

Sample Name	Lab Code	PID Detector	FID Detector
		Percent Recovery 4-Bromofluorobenzene	Percent Recovery α,α,α -Trifluorotoluene
MW-1 (26)	S9601853-001	101	97
MW-4 (21)	S9601853-002	102	94
MW-3 (26)	S9601853-003	101	97
MW-2 (26)	S9601853-004	100	103
M-7 (27)	S9601853-005	97	109
Batch QC (MS)	S9601827-007MS	99	109
Batch QC (DMS)	S9601827-007DMS	98	109
Method Blank	S961114-WB1	100	94
Method Blank	S961115-WB1	100	95

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	Service Request:	S9601853
Project:	2111 San Leandro / #20805-127.002/TO#19350.00	Date Collected:	11/6/96
Sample Matrix:	Water	Date Received:	11/6/96
		Date Extracted:	NA
		Date Analyzed:	11/14/96

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

Sample Name: Batch QC
 Lab Code: S9601827-007MS, DMS

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery				Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS	CAS Acceptance Limits		
	Gasoline	250		250	ND	240	240	96	96	

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#19350.00

Service Request: S9601853
Date Analyzed: 11/14/96

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	24.7	99	85-115
Toluene	25	24.5	98	85-115
Ethylbenzene	25	23.9	96	85-115
Xylenes, Total	75	72.2	96	85-115
Gasoline	250	249	100	90-110
Methyl <i>tert</i> -Butyl Ether	50	46	92	85-115

**Columbia
Analytical
Services^{inc.}**

November 19, 1996

Service Request No.: S9601852

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

RE: 2111 SAN LEANDRO/20805-127.002/TO#19350.00

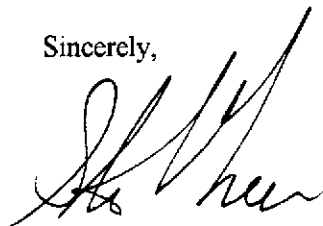
Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on November 6, 1996. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

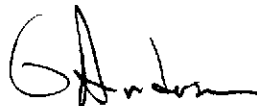
Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 7, following, have been thoroughly reviewed and approved for release in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

Please feel welcome to contact me should you have questions or further needs.

Sincerely,



Steven L. Green
Project Chemist



Greg Anderson
Regional QA Coordinator

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
TTLIC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#193650.00
Sample Matrix: Water

Service Request: S9601852
Date Collected: 11/6/96
Date Received: 11/6/96
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	Method Blank
Lab Code:	S9601852-001	S961114-WB1	S961115-WB1
Date Analyzed:	11/14-15/96	11/14/96	11/15/96

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 <i>tert</i> -Butyl Ether	3	100	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#193650.00
Sample Matrix: Water

Service Request: S9601852
Date Collected: 11/6/96
Date Received: 11/6/96
Date Extracted: NA
Date Analyzed: NA

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

Sample Name	Lab Code	PID Detector	FID Detector
		Percent Recovery 4-Bromofluorobenzene	Percent Recovery α,α,α -Trifluorotoluene
MW-5 (23)	S9601852-001	101	101
Batch QC (MS)	S9601827-007MS	99	109
Batch QC (DMS)	S9601827-007DMS	98	109
Method Blank	S961114-WB1	100	94
Method Blank	S961115-WB1	100	95

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	Service Request:	S9601852
Project:	2111 San Leandro / #20805-127.002/TO#193650.00	Date Collected:	11/6/96
Sample Matrix:	Water	Date Received:	11/6/96
		Date Extracted:	NA
		Date Analyzed:	11/14/96

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

Sample Name: Batch QC
 Lab Code: S9601827-007MS, DMS

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS		
	Gasoline	250		250	ND	240	240		

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 2111 San Leandro / #20805-127.002/TO#193650.00

Service Request: S9601852
Date Analyzed: 11/14/96

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	24.7	99	85-115
Toluene	25	24.5	98	85-115
Ethylbenzene	25	23.9	96	85-115
Xylenes, Total	75	72.2	96	85-115
Gasoline	250	250	100	90-110
Methyl <i>tert</i> -Butyl Ether	50	46	92	85-115

