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

Date March 31, 1996
Project 20805-127.001

To:

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

We are enclosing:

Copies	Description
1	Fourth quarter 1995 groundwater monitoring results for ARCO service station 2111, San Leandro, California

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

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
Michael Whelan, ARCO Products Company
Ivy Inouye, EMCON
File

ARCO Products Company

Date:

March 31, 1996

Re: ARCO Station #

2111 • 1156 Davis Street • San Leandro, CA
Fourth Quarter 1995 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:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

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

March 14, 1996
Project 20805-127.001

Mr. Michael Whelan
ARCO Products Company
P.O. Box 612530
San Jose, California 95161

Re: Fourth quarter 1995 groundwater monitoring program results, ARCO service station 2111, San Leandro, California

Dear Mr. Whelan:

This letter presents the results of the fourth quarter 1995 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

REGISTERED GEOLOGIST
JOHN CHARLES YOUNG
Exp 7/96
NO. 6407
STATE OF CALIFORNIA

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

SJ/H:\2111\2111_LTR.DOC-95 imi:20805-127.001

March 14, 1996

ARCO QUARTERLY REPORT

Station No.: 2111 Address: 1156 Davis Street, San Leandro, California
EMCON Project No. 20805-127.001
ARCO Environmental Engineer/Phone No.: Michael Whelan/(408) 453-1640
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 -(Fourth 1995):

1. Conducted quarterly groundwater monitoring and sampling for fourth quarter 1995.

WORK PERFORMED DURING FIRST QUARTER 1996:

1. Installed groundwater monitoring wells MW-5, MW-6, MW-7, and vapor extraction wells V-1, V-2, V-3, and V-4 between February 28 and March 1, 1996.

WORK PROPOSED FOR NEXT QUARTER (First- 1996):

1. Perform quarterly groundwater monitoring and sampling for first quarter 1996.
2. Submit quarterly report for fourth quarter 1995.

Current Phase of Project: Site Assessment and Quarterly Groundwater Monitoring
Frequency of Sampling: Quarterly (groundwater)
Frequency of Monitoring: Quarterly (groundwater)
Is Free Product (FP) Present On-site (Well #'s): ☐ Yes ☒ No
Water Wells or Surface Waters within 2000 ft.
Radius and Their Respective Directions: San Leandro Creek, approximately 2000 feet north
Current Remediation Techniques: None
Approximate Depth to Groundwater: 16 feet
Groundwater Gradient NA ft/ft toward NA

ATTACHED:

- Table 1 - Groundwater Monitoring Data, Fourth Quarter 1995
- Table 2 - Historical Groundwater Elevation Data
- Table 3 - Historical Groundwater Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Figure 1 - Site Location
- Figure 2 - Site Plan
- Figure 3 - Groundwater Data, Fourth Quarter 1995
- Appendix A - Field Data Sheets, Fourth Quarter 1995 Groundwater Monitoring Event
- Appendix B - Analytical Results and Chain of Custody Documentation, Fourth Quarter 1995 Groundwater Monitoring Event

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

Table 1
Groundwater Monitoring Data
Fourth Quarter 1995

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

Date: 03-12-96

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	12-14-95	NR	17.09	NR	ND	NR	NR	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-2	12-14-95	NR	15.36	NR	ND	NR	NR	12-14-95	7300	900	25	180	1000	<200*	--	--
MW-3	12-14-95	NR	16.70	NR	ND	NR	NR	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	<0.5	<50
MW-4	12-14-95	NR	15.35	NR	ND	NR	NR	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--

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
- - : not analyzed
*: method reporting limit was raised due to high analyte concentration requiring sample dilution
NR: not reported; data not available or not measurable
ND: none detected

Table 2
Historical Groundwater Elevation Data

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

Date: 03-12-96

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 foot/foot
MW-1	08-01-95	NR	17.45	NR	ND	NR	NR
MW-1	12-14-95	NR	17.09	NR	ND	NR	NR
MW-2	08-01-95	NR	15.67	NR	ND	NR	NR
MW-2	12-14-95	NR	15.36	NR	ND	NR	NR
MW-3	08-01-95	NR	17.00	NR	ND	NR	NR
MW-3	12-14-95	NR	16.70	NR	ND	NR	NR
MW-4	08-01-95	NR	15.65	NR	ND	NR	NR
MW-4	12-14-95	NR	15.35	NR	ND	NR	NR

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
NR: not reported; data not available or not measurable
ND: none detected

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

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

Date: 03-12-96

Well Designation	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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-1	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-2	08-01-95	23000	1300	310	500	3500	--	--	--
MW-2	12-14-95	7300	900	25	180	1000	<200*	--	--
MW-3	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	0.6	76^
MW-3	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	<0.5	<50
MW-4	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-4	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--

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
-- : not analyzed
^: 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

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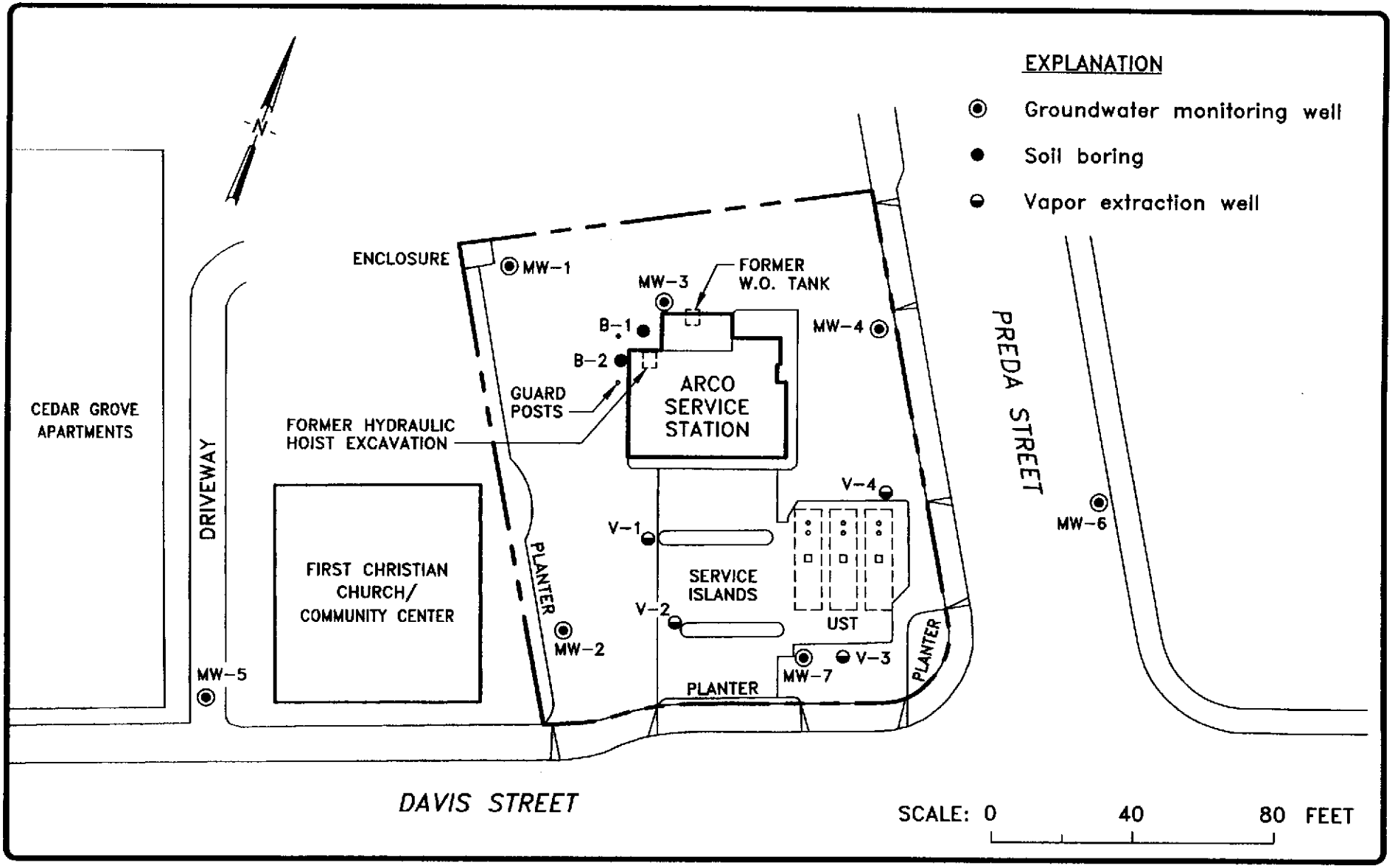
emcon

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

SITE LOCATION

FIGURE
1
PROJECT NO.
805-127.01

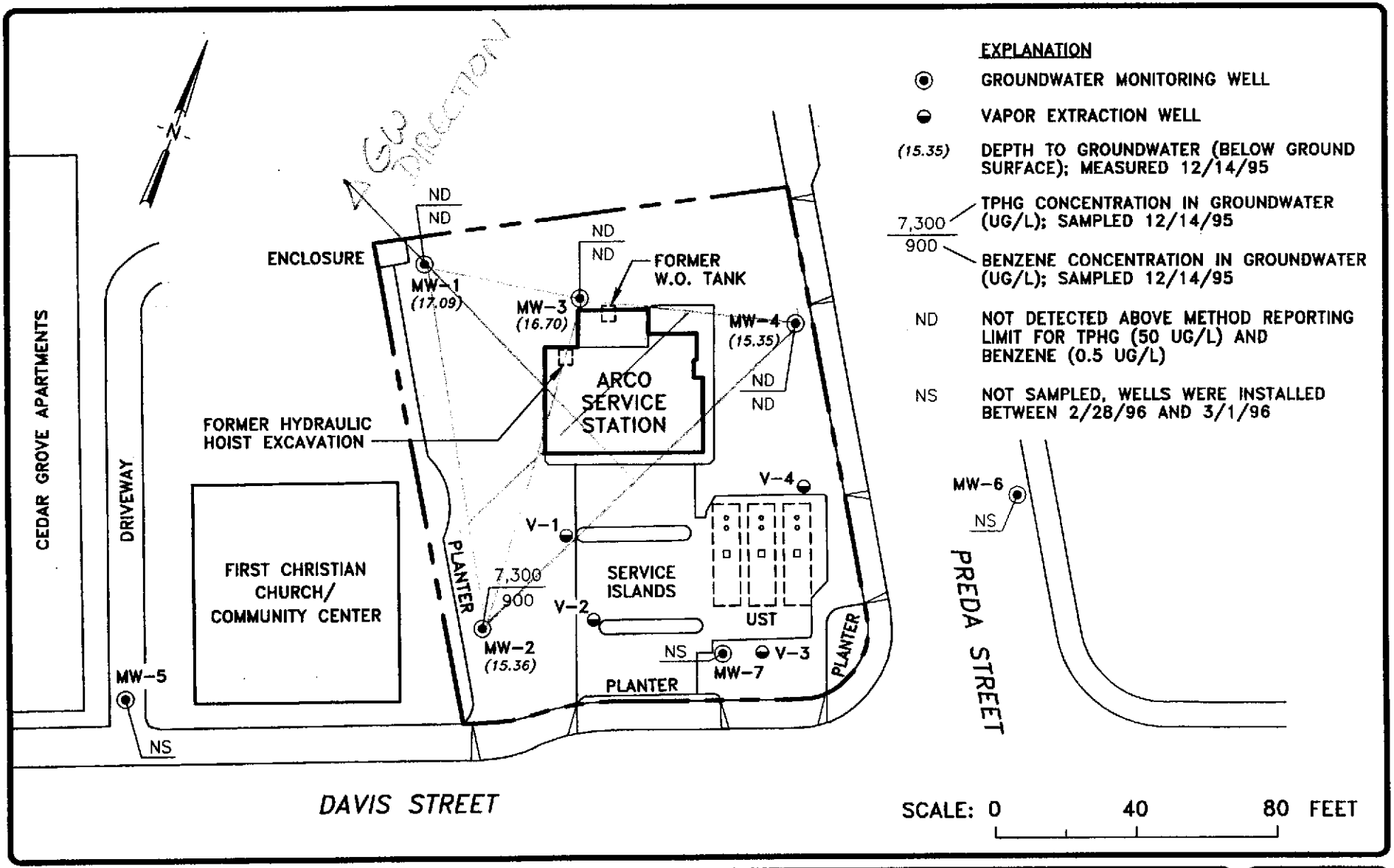


EMCON

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

SITE PLAN

FIGURE
2
PROJECT NO.
805-127.01



EMCON

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

GROUNDWATER DATA
FOURTH QUARTER 1995

FIGURE
3
PROJECT NO.
805-127.01

APPENDIX A

FIELD DATA SHEETS, FOURTH QUARTER 1995 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-226.01 STATION ADDRESS : 1156 Davis Street, San Leandro DATE : 12-14-95

ARCO STATION # : 2111 FIELD TECHNICIAN : Mike Ross DAY : THURSDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	**MW-1**	Good	Yes	~~No~~	3490	Yes	17.09	17.09	NA	NA	26.5	
2	**MW-4**	Good	Yes	~~No~~	3490	Yes	15.35	15.35	NA	NA	21.6	
3	**MW-3**	Good	Yes	No	3490	Yes	16.70	16.70	NA	NA	26.8	
4	**MW-2**	Good	Yes	No	3490	Yes	15.36	15.36	NA	NA	26.7	

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-226.01 SAMPLE ID: MW-1(26)

PURGED BY: M. ROSS CLIENT NAME: ARCO 2111

SAMPLED BY: M. ROSS LOCATION: San Leandro

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.): 6.01

DEPTH TO WATER (feet): 17.09 CALCULATED PURGE (gal.): 18.05

DEPTH OF WELL (feet): 26.3 ACTUAL PURGE VOL. (gal.): 18.5

DATE PURGED: 12-14-95 Start (2400 Hr) 1020 End (2400 Hr) 1031

DATE SAMPLED: 12-14-95 Start (2400 Hr) 1040 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1023	6.5	6.26	797	Light Brn → 62.9	→	MOD
1027	12.5	6.21	801	64.4	Lt Brn	MOD
1031	18.5	6.19	792	64.1	Lt Brn	TRACE

D. O. (ppm): NA ODOR: NONE COLOR: NA (COBALT 0 - 500) TURBIDITY: 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: GOOD LOCK #: 3490

REMARKS: ___

Meter Calibration: Date: 12-14-95 Time: 0955 Meter Serial #: 9210 Temperature °F: 58.8

(EC 1000 989 / 1000) (DI —) (pH 7 705 / 700) (pH 10 1003 / 1006) (pH 4 397 / —)

Location of previous calibration: —

Signature: Mike Ross Reviewed By: [illegible] Page 1 of 4

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-226.01 SAMPLE ID: MW-2(26)

PURGED BY: M. ROSS CLIENT NAME: ARCO 2111

SAMPLED BY: M. ROSS LOCATION: San Leandro

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.):	7.40
DEPTH TO WATER (feet):	15.36	CALCULATED PURGE (gal.):	22.22
DEPTH OF WELL (feet):	26.7	ACTUAL PURGE VOL. (gal.):	22.5

DATE PURGED: 12-14-95 Start (2400 Hr) 1212 End (2400 Hr) 1216

DATE SAMPLED: 12-14-95 Start (2400 Hr) 1230 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1214	7.5	6.32	789	64.4	Light Brown	Mod
1215	15.0	6.43	792	66.0	"	Trace
1216	22.5	6.35	802	66.3	Cldy	Trace

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

COLOR (COBALT 0 - 500): NA

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

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: Good LOCK #: 3490

REMARKS: ___

Meter Calibration: Date: 12-14-95 Time: 0955 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: MW-1

Signature: Mike Ross Reviewed By: SE Page 2 of 4

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-226.01 SAMPLE ID: MW-3(26)

PURGED BY: M. ROSS CLIENT NAME: ARCO 2111

SAMPLED BY: M. ROSS LOCATION: San Leandro

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

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ✓ 4.96 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 6.59

DEPTH TO WATER (feet): 16.70 CALCULATED PURGE (gal.): 19.79

DEPTH OF WELL (feet): 26.8 ACTUAL PURGE VOL. (gal.): 20.0

DATE PURGED: 12-14-95 Start (2400 Hr) 1130 End (2400 Hr) 1139

DATE SAMPLED: 12-14-95 Start (2400 Hr) 1150 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1132	7.00	6.42	786	64.7	BRN	MOD
1135	13.5	6.36	789	64.9	Cldy	TRACE
1139	20.0	6.44	787	65.0	Cldy	clr

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

COLOR (COBALT 0 - 500): NA

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

Field QC samples collected at this well: NA

Parameters field filtered at this well: 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: Good LOCK #: 3490

REMARKS: ___

Meter Calibration: Date: 12-14-95 Time: 0955 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: MW-1

Signature: Mike Ross Reviewed By: SF Page 3 of 4

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-226.01 SAMPLE ID: MW-4(21)

PURGED BY: M. Ross CLIENT NAME: ARCO 2111

SAMPLED BY: M. Ross LOCATION: San Leandro

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.): 4.08

DEPTH TO WATER (feet): 15.35 CALCULATED PURGE (gal.): 12.25

DEPTH OF WELL (feet): 21.6 ACTUAL PURGE VOL. (gal.): 12.5

DATE PURGED: 12-14-95 Start (2400 Hr) 1054 End (2400 Hr) 1105

DATE SAMPLED: 12-14-95 Start (2400 Hr) 1115 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1059	4.5	6.33	822	64.5	BRN	Heavy
1102	8.5	6.36	812	65.8	BRN	Heavy
1105	12.5	6.37	296	65.4	BRN	MOD

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

COLOR (COBALT 0 - 500): NA

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

Field QC samples collected at this well: NA

Parameters field filtered at this well: 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: Good LOCK #: 3490

REMARKS: ___

Meter Calibration: Date: 12-14-95 Time: 0955 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: MW-1

Signature: Mike Ross Reviewed By: SJ Page 4 of 4

APPENDIX B

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION, FOURTH QUARTER 1995, GROUNDWATER MONITORING EVENT

Columbia Analytical Services inc.

December 28, 1995

Service Request No: S9501611

John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **0805-127.01 / TO# 17075.00 / 2111 San Leandro**

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on December 14, 1995. 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 14, 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:

Christina V. Rayburn for

Steven L. Green
Project Chemist

Annelise Jade Bazar

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

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:**	S9501611
Project:	0805-127.01 / TO# 17075.00 / 2111 San Leandro	**Date Collected:**	12/14/95
Sample Matrix:	Water	**Date Received:**	12/14/95
		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:	S9501611-001	S9501611-002	S9501611-003
		Date Analyzed:	12/21/95	12/21/95	12/21/95
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:	ARCO Products Company	**Service Request:**	S9501611
Project:	0805-127.01 / TO# 17075.00 / 2111 San Leandro	**Date Collected:**	12/14/95
Sample Matrix:	Water	**Date Received:**	12/14/95
		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)**	**Method Blank**	**Method Blank**
	Lab Code:	S9501611-004	S951221-WB	S951222-WB
	Date Analyzed:	12/22/95	12/21/95	12/22/95
Analyte	**MRL**			
TPH as Gasoline	50	7,300	ND	ND
Benzene	0.5	900	ND	ND
Toluene	0.5	25	ND	ND
Ethylbenzene	0.5	180	ND	ND
Total Xylenes	0.5	1,000	ND	ND
Methyl-tert-butyl ether	3	<200 *	ND	ND

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	L9504364
Project:	ARCO Products Company #2111/#0805-127.01	**Date Collected:**	12/14/95
Sample Matrix:	Water	**Date Received:**	12/14/95
		Date Extracted:	12/20/95
		Date Analyzed:	12/20/95

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

Sample Name	Lab Code	MRL	Result
MW-3	L9504364-001	0.5	ND
Method Blank	L9504364-MB	0.5	ND

1AMRL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9501611
Project:	0805-127.01 / TO# 17075.00 / 2111 San Leandro	**Date Collected:**	12/14/95
Sample Matrix:	Water	**Date Received:**	12/14/95
		Date Extracted:	12/27/95
		Date Analyzed:	12/27,28/95

TPH as Diesel
EPA Method 3510/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name	Lab Code	MRL	Result
MW-3 (26)	S9501611-003	50	ND
Method Blank	S951227-WB	50	ND

1AMRL/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-127.01 / TO# 17075.00 / 2111 San Leandro
Sample Matrix: Water

Service Request: S9501611
Date Collected: 12/14/95
Date Received: 12/14/95
Date Extracted: NA
Date Analyzed: 12/21,22/95

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)	S9501611-001	94	95
MW-4 (21)	S9501611-002	93	93
MW-3 (26)	S9501611-003	94	92
MW-2 (26)	S9501611-004	90	105
MW-4 (21) MS	S9501611-001MS	95	96
MW-4 (21) DMS	S9501611-001DMS	95	100
Method Blank	S951221-WB	91	91
Method Blank	S951222-WB	94	96
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-127.01 / TO# 17075.00 / 2111 San Leandro

Service Request: S9501611
Date Analyzed: 12/21/95

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	24.8	99	85-115
Toluene	25	24.7	99	85-115
Ethylbenzene	25	24.5	98	85-115
Xylenes, Total	75	75.3	100	85-115
Gasoline	250	233	93	90-110
Methyl-tert-butyl Ether	50	50.1	100	85-115

ICV25AL/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9501611
Project:	0805-127.01 / TO# 17075.00 / 2111 San Leandro	**Date Collected:**	12/14/95
Sample Matrix:	Water	**Date Received:**	12/14/95
		Date Extracted:	NA
		Date Analyzed:	12/21,22/95

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

Sample Name: MW-4 (21)
Lab Code: S951611-002

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Benzene	25	25	ND	24.2	24.8	97	99	75-135	2
Toluene	25	25	ND	24.4	25.0	98	100	73-136	2
Ethylbenzene	25	25	ND	24.2	24.9	97	100	69-142	3

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	L9504364
Project:	ARCO Products Company #2111/#0805-127.01	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	12/20/95

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	2.03	2.03	1.86	1.86	92	92	75-125	<1

* Sample quantity was insufficient to perform matrix spike and matrix spike duplicate. Three separate, replicate one liter samples are required to analyze sample and spikes.

DLCS/032395

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9501611
Project:	0805-127.01 / TO# 17075.00 / 2111 San Leandro	**Date Collected:**	12/14/95
Sample Matrix:	Water	**Date Received:**	12/14/95
		Date Extracted:	12/27/95
		Date Analyzed:	12/27,28/95

Surrogate Recovery Summary
TPH as Diesel
EPA Method 3510/California DHS LUFT Method

Sample Name	Lab Code	Percent Recovery p-Terphenyl
MW-3 (26)	S9501611-003	96
MW-3 (26) MS	S9501611-003MS	78
MW-3 (26) DMS	S9501611-003DMS	88
Method Blank	S951227-WB	77

CAS Acceptance Limits: 66-123

SUR1/062994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9501611
Project:	0805-127.01 / TO# 17075.00 / 2111 San Leandro	**Date Analyzed:**	12/27/95

Initial Calibration Verification (ICV) Summary
TPH as Diesel
California DHS LUFT Method
Units: ppm

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
TPH as Diesel	1,000	999	100	90-110

ICV25AL/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9501611
Project:	0805-127.01 / TO# 17075.00 / 2111 San Leandro	**Date Collected:**	12/14/95
Sample Matrix:	Water	**Date Received:**	12/14/95
		Date Extracted:	12/27/95
		Date Analyzed:	12/27,28/95

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Diesel
EPA Method 3510/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name: MW-3 (26)
Lab Code: S9501611-003

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
TPH as Diesel	5,240	5,240	ND	6,790	6,070	130	116	61-141	11

DMSTS/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 17075.00 — 29804.369

Chain of Custody

ARCO Facility no. 2111 — City (Facility) Santa [illegible]
ARCO engineer Mike Whelan — Telephone no. (ARCO) [illegible]
Project manager (Consultant) John Young
Telephone no. (Consultant) (408) 453-7300 — Fax no. (Consultant) (408) 453-7842
Consultant name EMCON — Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131
Laboratory name: [illegible]
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 (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 ☐	TPH - Diesel	
MW-1(26)	1	2		X		X	HCL	12-14-95	1040		X											
MW-4(21)	2	2		X		X	HCL	↓	1115		X											
MW-3(26)	3	6	-1	X		X	HCL	↓	1150		X			X							X	
MW-7(26)	4	2		X		X	HCL	↓	1230		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: All Wells 2-40ml HCL VOAs. MW-3 add 2-1liter glass HCL, 2-1liter glass NP. #0805-127.01

Lab number: S950l611

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒ — Due 12-29

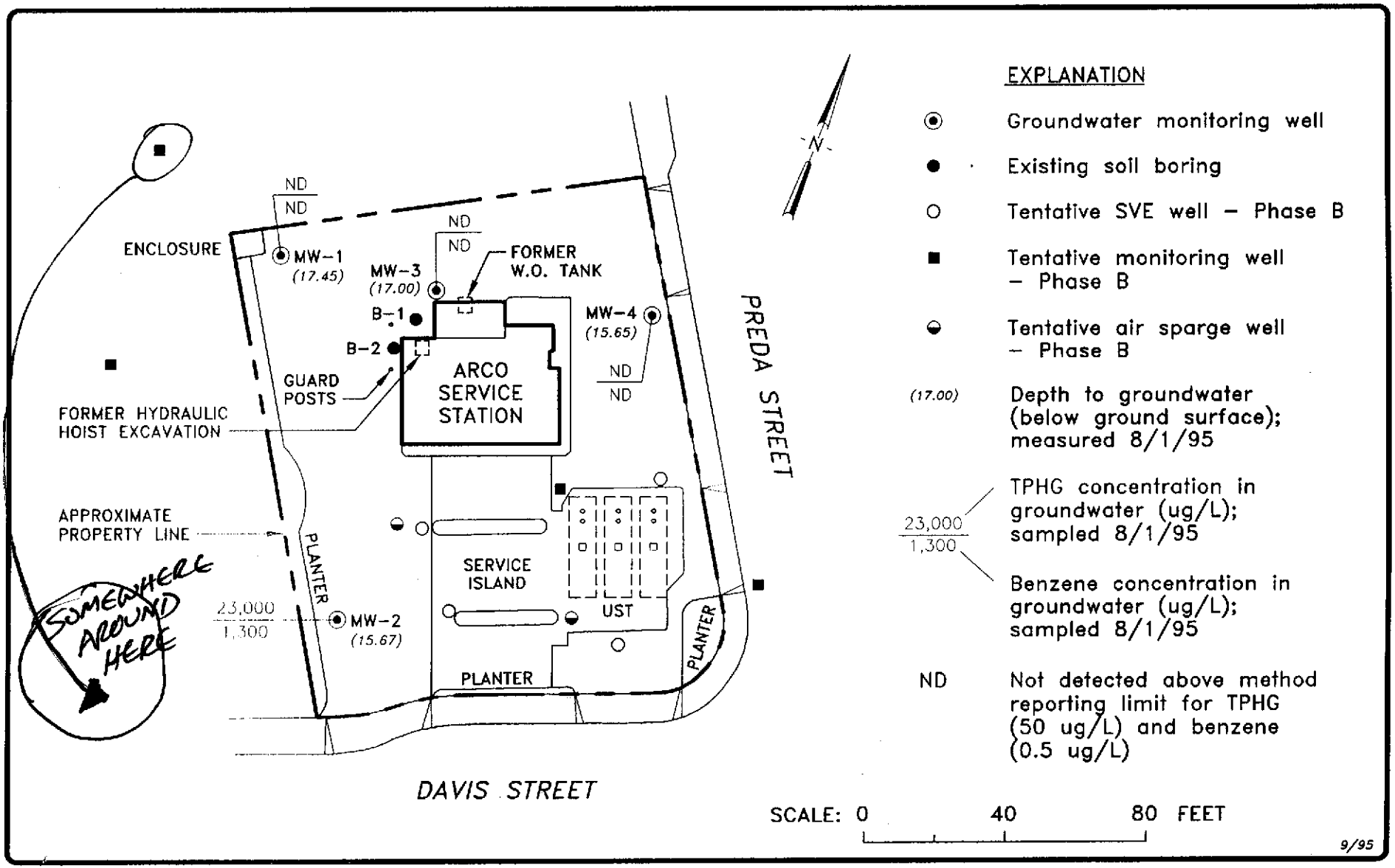
Condition of sample:

Temperature received:

Relinquished by	Date	Time	Received by
Relinquished by sampler: [signature]	12-14-95	1335	Joanne Brown
Relinquished by:			Received by:
Relinquished by: Joanne Brown	12-14-95	1700	Received by laboratory: Catherine Haarspaa — Date 12/15/95 — Time 500pm

CAS-L: 418.1 / CAS-S: 6 BTEX (MTBE) TPH-D

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



emcon

ARCO PRODUCTS COMPANY
SERVICE STATION NO. 2111, 1156 DAVIS STREET
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

GROUNDWATER CONDITIONS

FIGURE
2
PROJECT NO.
805-127.01