PACIFIC
ENVIRONMENTAL
GROUP INC.

779

December 8, 1992
Project 330-06.14

Ms. Juliett Shin
Department of Environmental Health
Hazardous Materials Division
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94621

Re: ARCO Service Station 608
17601 Hesperian Boulevard
San Lorenzo, California

Dear Ms. Shin:

As requested in Alameda County Health Care Services Agency's (ACHCS's) letter dated June 5, 1992, Pacific Environmental Group, Inc. (PACIFIC) is preparing a baseline health risk assessment on behalf of ARCO Products Company. This assessment will determine the potential health risk to the domestic irrigation water well owners resulting from petroleum hydrocarbon-impacted groundwater located downgradient of the referenced site. Potential health risk will be calculated for adults and children via inhalation, ingestion, and dermal contact exposure route pathways.

As you are aware, the determination of maximum reasonable risk should be based on site-specific characterization data when available. PACIFIC has prepared this letter to request ACHCS assistance in determining the appropriate values for the carcinogenic risk parameters (i.e., exposure frequency, concentration, etc.) based on available site-specific data. This letter presents the recommended risk assessment parameter values with justification for your review and approval.

2025 Gateway Place, Suite 440, San Jose, California 95110 (408) 441-7500 FAX (408) 441-7539
620 Contra Costa Blvd., Suite 209, Pleasant Hill, California 94523 (510) 825-0855 FAX (510) 825-0882

RISK PARAMETER VALUES

Based on site-specific characterization data, the following parameter values are recommended:

Concentration in Water

Contaminant concentration in water should be based on the average benzene concentration (95th percentile) of the hydrocarbon-impacted groundwater. The average benzene concentration (95th percentile) in the domestic irrigation water wells is currently 3.5 parts per billion, and is based on previous analytical data (Table 1). This concentration will be recalculated as additional quarterly sampling data are collected. This concentration is considered conservative because: (1) the average concentration of the impacted groundwater is significantly below the 95th percentile average, (2) primary source removal and hydraulic control of the hydrocarbon-impacted groundwater on site has been achieved, reducing the risk of future migration of on-site dissolved hydrocarbons, and (3) benzene concentrations should decline naturally with time.

Concentration in Air

Contaminant concentration in air should be based on the average benzene concentration (95th percentile) observed before, during, and after domestic irrigation water well operation. The average benzene concentration (95th percentile) in air is 18.9 parts per billion, by volume, and is based on air samples collected July 22, 1992 (Table 2). The certified analytical reports and chain-of-custody documentation are attached. This value is considered conservative because: (1) the background average benzene concentration (95th percentile) in air is 57.6 parts per billion, by volume, which results presumably from automobile traffic, and (2) it assumes the well owners would experience direct and continuous exposure (at the well head without natural dilution effects) during the entire operation of the well.

Ingestion Rate

Ingestion rate should be based on the likelihood of groundwater ingestion by adults and children. Previous analytical results (attached) indicate that the groundwater exceeds the State of California drinking water standards for color, odor, and turbidity (Table 3). Because the likelihood of groundwater ingestion is reduced when aesthetic water quality is low, PACIFIC recommends that an ingestion rate of 0.5 liters per day is appropriate as a maximum. Additionally, the

domestic irrigation water well owners confirmed that the domestic irrigation water wells are used for irrigation purposes only, and not as a drinking water source.

Exposure Time and Frequency

Exposure time and frequency should be based on actual domestic irrigation water well operational data. Based on data collected from all domestic irrigation water well owners (Table 4), the average exposure time, or duration of well operation, is 2.7 hours per day (95th percentile), and the average exposure frequency, or frequency of well operation, is 140 days per year (95th percentile). These values are considered conservative because they assume well owner direct and continuous exposure to (similar to showering with) the extracted groundwater during the entire operation of the well.

Exposure Duration

Exposure duration is generally based on the national average time at one residence. The national average time at one residence (90th percentile) is 30 years (EPA, 1989). PACIFIC suggests that this residence time is an inappropriate residence time for California homeowners, especially homeowners located in the San Francisco Bay area. The national average time (50th percentile) at one residence is 9 years (EPA, 1989). Although this confidence interval is closer to one standard deviation, PACIFIC suggests that this value better corresponds with California and San Francisco Bay area residence times. This confidence interval is further supported by Chicago Title, a title and deed company. Based on their data, the median California residence time during 1991 (a recessionary year) was 12.4 years. Therefore, even though the national average time of 9 years (50th percentile) may be warranted, PACIFIC recommends the more conservative residence time of 12.4 years for exposure duration.

SUMMARY

On behalf of ARCO, PACIFIC is preparing a baseline health risk assessment for the referenced site. PACIFIC has requested ACHCS assistance in determining the appropriate carcinogenic risk parameter values based on available site-specific data. This letter presents the recommended risk assessment parameter values with justification for ACHCS review and approval.

ARCO and PACIFIC greatly appreciate ACHCS cooperation and assistance with the review and approval of the recommended parameter values. We look forward to working closely with ACHCS to expedite remedial action to maintain protection of public health. Toward this end, we would like to meet with you after you have

had an opportunity to review this letter, to discuss this project in detail and to present a schedule for remedial action.

If you have any questions regarding this letter, please do not hesitate to contact us.

Sincerely,

Pacific Environmental Group, Inc.

Keith Winemiller
Senior Staff Engineer

Debra J. Moser
Project Manager

Attachments: Table 1 - Domestic Irrigation Water Well Sampling Results - Total Petroleum Hydrocarbons Analyses
Table 2 - Off-Site Air Sampling Results - Total Petroleum Hydrocarbons Analyses
Table 3 - Domestic Irrigation Water Well Analytical Results - Drinking Water Analyses
Table 4 - Domestic Irrigation Water Well Operational Data
Certified Analytical Reports and Chain-of-Custody Documentation

REFERENCE

Environmental Protection Agency (EPA), 1989, *Risk Assessment Guidance for Superfund, Volume I. Human Health Evaluation Manual (Part A) Interim Final*, Office of Emergency and Remedial Response, EPA/540/1-89/002.

cc: Mr. Michael Whelan, ARCO Products Company
Mr. Chris Winsor, ARCO Products Company
Mr. Charles Lapin, ARCO Products Company
Mr. John Meck, ARCO Products Company
Mr. Eddie So, Regional Water Quality Control Board

Table 1
Domestic Irrigation Water Well Sampling Results -
Total Petroleum Hydrocarbons Analyses

ARCO Service Station 608
17601 Hesperian Boulevard
San Lorenzo, California

Well Address	Sampled 09-11/91 Gasoline (ppb)	Sampled 09-11/91 Benzene (ppb)	Sampled 10/92 Gasoline (ppb)	Sampled 10/92 Benzene (ppb)
17349 VM	780	13	2,200	<5.0
17372 VM	300	5.5	220	<1.0
17302 VM	72	0.64	NS	NS
590 H	<30	<0.3	<50	<0.5
633 H	NS	NS	NS	NS
634 H	NS	NS	NS	NS
642 H	<30	<0.3	<50	<0.5
675 H	NS	NS	NS	NS
17197 VM	<30	<0.3	<50	<0.5
17200 VM	440	2.7	NS	NS
17203 VM	<30	<0.3	NS	NS
17348 VM	NS	NS	NS	NS
17371 VM	870	9.0	<50	<0.5
17393 VM	31	<0.3	NS	NS
Average (50th percentile)	NA	3.2	NA	0.7
Average (95th percentile)	NA	6.4	NA	1.6
Benzene average (95th percentile) of all sampling events				**3.5**

ppb = Parts per billion
NS = Not sampled
NA = Not applicable
Averages include ND-samples calculated as one-half of the noted detection limit.

what is your detection limit

0.25 ppb

Table 2
Off-Site Air Sampling Results -
Total Petroleum Hydrocarbons Analyses

ARCO Service Station 608
17601 Hesperian Boulevard
San Lorenzo, California

Sample Identification	Sample Date	Benzene (ug/m^3)	Sample Location Description
AVM100	07/22/92	3.4	Across Via Magdalena 100' Downwind
AH&VM	07/22/92	9.6	Corner of Hacienda Avenue and Via Magdalena
AH&H	07/22/92	6.8	Corner of Hacienda Avenue and Hesperian Boulevard
AVM+P	07/22/92	*	Corner of Via Magdalena and Potrero Court
Background Average (50th percentile)		6.6 ug/m^3, (or 26.6 ppbv)	
Background Average (95th percentile)		14.3 ug/m^3, (or 57.6 ppbv)	
BO17349	07/22/92	2.5	Well 17349 (Well Before Operation)
DO17349	07/22/92	2.8	Well 17349 (Well During Operation)
AO17349	07/22/92	3.8	Well 17349 (Well After Operation)
Well 17349 Average (50th percentile)		3.0 ug/m^3, (or 12.1 ppbv)	
Well 17349 Average (95th percentile)		4.7 ug/m^3, (or 18.9 ppbv)	
IV17349	07/22/92	2.5	Irrigation Vapor (During Well 17349 Operation)
P17349	07/22/92	2.1	Plant Vapor (During Well 17349 Operation)

ug/m^3 = Micrograms per cubic meter
ppbv = Parts per billion, by volume
* = Sample container failed (no analysis was conducted on sample)

Table 3
Domestic Irrigation Water Well Analytical Results - Drinking Water Analyses

ARCO Service Station 608
17601 Hesperian Boulevard
San Lorenzo, California

Well Identification	Odor (units)	Color (units)	Turbidity (NTU)
Well 17349	-	20	9
Well 17203	50	5	8.6
Regulatory Limit*	3	15	5

NTU = Nephelometric Turbidity Unit
* = California Secondary Standards for Drinking Water
Samples collected July 22, 1992

Table 4
Domestic Irrigation Water Well Operational Data

ARCO Service Station 608
17601 Hesperian Boulevard
San Lorenzo, California

Well Identification	Well Status	Frequency of Operation (days/year)	Duration of Operation (hours/day)
590	Operational	52	6 to 7
633	Non-Operational	NA	NA
634	Non-Operational	NA	NA
642	Operational	260	1 to 1.5
675	Non-Operational	NA	NA
17197	Unknown*	52	NA
17200	Non-Operational	NA	NA
17203	Operational	24	1.5
17302	Unknown*	156	5
17348	Non-Operational	NA	NA
17349	Operational	260	1
17371	Operational	24	2
17372	Operational	260	2
17393	Non-Operational	NA	NA
Average (50th percentile)		78	1.5
Average (95th percentile)		140	2.7

NA = Not available
* = Classified as operational until status is confirmed
Averages include non-operational status wells.

Environmental Analytical Service, Inc.

August 5, 1992
Reference Number: 20961

Keith Winemiller
Pacific Environmental Group
2025 Gateway Plaza, Suite 440
San Jose, CA 95110

Dear Keith:

Enclosed is the analytical report for the samples which were received by Environmental Analytical Service on July 23, 1992.

The report consists of the following sections:

I. Sample Description
II. Analysis Request
III. Laboratory Narrative
IV. Quality Control Report
V. Analysis Results

If you have any questions on the analytical data or the report please contact myself or Vivian Longacre at (805) 541-3666.

Sincerely,

Steven D. Hoyt, Ph.D.
Laboratory Director

SDH/sg
enclosures

170-C Granada San Luis Obispo, CA 93401 (805) 541-3666 FAX: (805) 541-4550

ANALYTICAL REPORT

Reference Number: 20961
Analysis performed for: Pacific Environmental Group

I. Sample Description

The following samples were received for analysis by the methods described in Section 1.2.

Client Number	Lab Number	Client Number	Lab Number
B017349	20961	AVM100	20962
AH&VM	20963	AH&H	20964
1V173492	20965	D017349	20966
A017349	20967	P17349	20968

II. Analysis Requested

GC/FID BTXE (1-10)/TPH

III. Laboratory Narrative

All laboratory quality control criteria were met for the samples in this report.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above.

Steven D. Hoyt - Laboratory Director

Vivian Longacre - Air Lab Supervisor

ANALYTICAL REPORT

Reference Number: 20961
Analysis performed for: Pacific Environmental Group

IV. Quality Control

Project Specific QC Report.

No project specific QC (i.e. spikes and/or duplicates) was requested

Normal Laboratory QC Report.

A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your samples. A copy of the batch blank is included with the report.

Duplicate Control Samples.

A DCS is a well-characterized matrix (blank water, ambient air, or actual sample) which may or may not be spiked and run in duplicate with your sample batch. The results are on the attached Duplicate Sample/Spike results. Precision is measured using duplicate tests by Relative Percent Difference (RPD) as in:

$$RPD = \frac{(\%\ \text{recovery test 1} - \%\ \text{recovery test 2})}{(\text{recovery test 1} + \text{recovery test 2})/2} \times 100$$

METHOD BLANK REPORT

C2-C10 Hydrocarbons by GC/FID Batch Date: 7-29-92

Blank Run #: 748 Analyst: Tobe Cox

	ug/m3	ppbC
TNMHC	1.3	2.0

ug/m3	ppbC	Compound	ug/m3	ppbC	Compound
		Ethane			Cyclohexane
		Ethene			2-Methylhexane
		Acetylene			2,3-Dimethylpentane
		Propane			3-Methylhexane
		Propene			2,2,4-Trimethylpentane
		i-Butane			n-Heptane
		i-Butene			Methylcyclohexane
		1-Butene			2,2,3-Trimethylpentane
		1,3-Butadiene			2,4-Dimethylhexane
		n-Butane			2,3,4-Trimethylpentane
		t-2-Butene			Toluene
		2,2-Dimethylpropane			2,3-Dimethylhexane
		c-2-Butene			2-Methylheptane
		3-Methyl-1-butene			3-Ethylhexane
		i-Pentane			n-Octane
		1-Pentene			Ethylcyclohexane
		2-Methyl-1-butene			Ethylbenzene
		n-Pentane			m-xylene (p-xylene)
		Isoprene			p-xylene
		t-2-Pentene			Styrene
		c-2-Pentene			o-Xylene
		2-Methyl-2-butene			n-Nonane
		2,2-Dimethylbutane			alpha-Pinene
		Cyclopentene			i-Propylbenzene
		4-Methyl-1-pentene			n-Propylbenzene
		Cyclopentane			m-Ethyltoluene
		2,3-Dimethylbutane			p-Ethyltoluene
		c-4-Methyl-2-pentene			1,3,5-Trimethylbenzene
		2-Methylpentane			o-Ethyltoluene
		3-Methylpentane			beta-Pinene
		2-Methyl-1-pentene			t-Butylbenzene
		1-Hexene			1,2,4-Trimethylbenzene
		n-Hexane			i-Butylbenzene
		t-2-Hexene			sec-Butylbenzene
		2-Methyl-2-pentene			n-Decane
		c-2-Hexene			1,2,3-Trimethylbenzene
		Methylcyclopentane			Methylstyrene
		2,4-Dimethylpentane			1,3-Diethylbenzene
		Benzene			1,4-Diethylbenzene

DUPLICATE SAMPLE RESULTS

Sample: Hydrocarbon STD
Duplcte: Hydrocarbon STD
Batch: 7-29-92 Method: C2-C10 Hydrocarbons by GC/FID

Compound	Sample ppbC	Duplicate ppbC	% RPD	QC Limits
Ethane	2.05	2.78	30	30
Propane	4.62	5.13	10	30
n-Butane	4.17	4.01	4	30
i-Pentane	2.94	3.81	26	30
n-Pentane	4.82	3.98	19	30
Cyclopentane	2.75	2.07	28	30
2-Methylpentane	6.36	4.86	27	30
n-Hexane	9.14	6.88	28	30
Methylcyclopentane	8.82	6.52	30	30
Benzene	7.31	5.30	32	30
Cyclohexane	2.37	1.84	25	30
3-Methylhexane	6.04	5.02	18	30
n-Heptane	7.23	5.27	31	30
2,4-Dimethylhexane	3.53	2.81	23	30
Toluene	6.98	6.24	11	30
2-Methylheptane	3.89	3.38	14	30
n-Octane	6.15	5.51	11	30
Ethylbenzene	12.91	13.89	7	30
m-xylene (p-xylene)	18.28	20.31	11	30
n-Nonane	8.09	8.91	10	30
p-Ethyltoluene	3.32	3.80	14	30
1,3,5-Trimethylbenzene	4.09	4.93	19	30
1,2,3-Trimethylbenzene	10.41	12.28	17	30

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	B017349	Date Analyzed:	7-29-92
Lab #:	20961	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	2.0	3.8
Toluene	6.2	12
Ethylbenzene	1.4	2.6
Xylenes	5.1	9.5
Total Petroleum Hydrocarbons	272 ppbC	170 ug/m3

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	AVM100	Date Analyzed:	7-29-92
Lab #:	20962	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	2.7	5.1
Toluene	9.1	17
Ethylbenzene	2.2	4.0
Xylenes	9.3	17
Total Petroleum Hydrocarbons	980 ppbC	612 ug/m3

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	AH&VM	Date Analyzed:	7-29-92
Lab #:	20963	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	7.7	14
Toluene	20	38
Ethylbenzene	5.7	11
Xylenes	24	44
Total Petroleum Hydrocarbons	733 ppbC	458 ug/m3

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	AH&H	Date Analyzed:	7-29-92
Lab #:	20964	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	5.4	10
Toluene	9.6	18
Ethylbenzene	1.7	3.1
Xylenes	7.4	14
Total Petroleum Hydrocarbons	346 ppbC	217 ug/m3

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	1V17349	Date Analyzed:	7-29-92
Lab #:	20965	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	2.0	3.8
Toluene	5.4	10
Ethylbenzene	0.80	1.5
Xylenes	3.6	6.6
Total Petroleum Hydrocarbons	224 ppbC	140 ug/m3

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	D017349	Date Analyzed:	7-29-92
Lab #:	20966	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	2.3	4.2
Toluene	6.3	12
Ethylbenzene	1.2	2.2
Xylenes	5.5	10
Total Petroleum Hydrocarbons	429 ppbC	268 ug/m3

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	A017349	Date Analyzed:	7-29-92
Lab #:	20967	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	3.0	5.7
Toluene	30	55
Ethylbenzene	3.6	6.6
Xylenes	7.9	15
Total Petroleum Hydrocarbons	1633 ppbC	1021 ug/m3

ANALYSIS REPORT SHEET

Hydrocarbons by GC/FID

Client:	Pacific Environ.	Sample Date:	7-22-92
Sample #:	P17349	Date Analyzed:	7-29-92
Lab #:	20968	Analyst:	Tobe Cox

Compound	Concentration ug/m3	Concentration ppbC
Benzene	1.7	3.2
Toluene	3.3	6.1
Ethylbenzene	5.4	9.9
Xylenes	23	43
Total Petroleum Hydrocarbons	385 ppbC	241 ug/m3

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 608-92-5C

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Keith Winemiller	Laboratory name EAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) (415) 571-2449	Telephone no. (Consultant) (408) 984-0536	Fax no. (Consultant) (408) 243-3911
Consultant name Pacific Environmental Group, Inc	Address (Consultant) 601 Civic Center Dr, Ste 202 Santa Clara, CA 95050		Contract number —

Method of shipment: UPS

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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
P17349	20968	1	A014	745	Air	—	—	7/22/92	9514		X											

Special detection Limit/reporting

Special QA/OC

Remarks: Please give verbal results to K. Winemiller ASAP
Return Original CofC with ORs

Lab number

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

Condition of sample:

Temperature received:

Relinquished by sampler	Date 7/22/92 Time 1220	Received by
Relinquished by	Date Time	Received by
Relinquished by	Date Time	Received by laboratory Date 7/23/92 Time 12:10p

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 608-92-5C

Chain of Custody

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ARCO engineer Mike Whelan	Telephone no. (ARCO) (415) 571-2449	Telephone no. (Consultant) (408) 984-0536	Fax no. (Consultant) (408) 243-3911
Consultant name Pacific Environmental Group, Inc.	Address (Consultant) 1601 Civic Center Dr, Ste 202, Santa Clara, CA 95050		Contract number —

Method of shipment: UPS

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 94.5	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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
DO17349	20966	1	A016	752	Air	—	—	7/22/92	9:06		X											

Special detection Limit/reporting:

Special QA/QC:

Remarks: Please give verbal results to K. Winemiller ASAP. Return Original C.o.C with CARs

Lab number:

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

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 7/22/92 Time 12:20	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 7/23/92 Time 12:10p

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. 608 · 92-5C

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Keith Winemiller	Laboratory name EAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) (415)571-2449	Telephone no. (Consultant) (408)984-6536	Fax no. (Consultant) (408)243-3911
Consultant name Pacific Environmental Group, Inc.	Address (Consultant) 1401 Civic Center Dr, Ste 202 Santa Clara CA 95050		Contract number —

Method of shipment: UPS

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 Gas 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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A0173491	20967	1	A015	743	Air	—	—	7/22/92	9:10		X											

Special detection Limit/reporting

Special QA/QC

Remarks: Please submit verbal results to K. Winemiller ASAP

Return Original COC with CARs

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	7/22/92	12:20	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory — Date 7/23/92 Time 12:10 p

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

APPC-3292 (2-91)

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 608.92.5C

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Keith Winemiller	Laboratory name EAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) (415) 571-2449	Telephone no. (Consultant) (408) 984-6336	Fax no. (Consultant) (408) 243-3911
Consultant name Pacific Environmental Group, Inc.	Address (Consultant) 1601 Civic Center Dr, Ste 202, Santa Clara, CA 95050		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 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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
			Can #																			
B017349	2096	1	E062	752	Air	—	—	7/22/92	9:04		X											

Special detection Limit/reporting

Special QA/QC

Remarks

Please give verbal results to K. Winemiller ASAP

Return Original CofC with CARs

Lab number

Turnaround time

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

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 7/22/92 Time 12:20	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 7/23/92 Time 12:10p

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 608-92-5C

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Keith Winemiller	Laboratory name EAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) (415)571-2449	Telephone no. (Consultant) (408)984-6536	Fax no. (Consultant) (408)243-3944
Consultant name Pacific Environmental Group, Inc	Address (Consultant) 1601 Civic Center Drive Suite 202 Santa Clara, CA 95050		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 EPA M602/8020/8015 gas	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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
AVM100	20962-1	1	A002	752	Air	—	—	7/22/92	8:40		X											

Condition of sample:

Temperature received:

Relinquished by sampler	Date 7/22/92	Time 12:20
Relinquished by	Date	Time
Relinquished by	Date	Time

Received by

Received by

Received by laboratory — Date 7/23/92 — Time 1210

Special detection Limit/reporting

Special QA/QC

Remarks

Please give verbal results to K. Winemiller ASAP

Return original CofC with CARs

Lab number

Turnaround time

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

Method of shipment

UPS

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

APPC-3292 (2-91)

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 608-92-5C

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Keith Wimmiller	Laboratory name E.A.S
ARCO engineer Mike Whelan	Telephone no. (ARCO) (415)571-2449	Telephone no. (Consultant) (408)984-6536	Fax no. (Consultant) (408)243-3911
Consultant name Pacific Environmental Group, Inc.	Address (Consultant) 1601 Civic Center Dr, Ste 202 Santa Clara, CA 95050		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 EPA M602/8020/8015 945	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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
AH+VM	20968	1	~~Soil~~ AD03	~~Water~~ Press	Air	—	—	7/22/92	8:35		X											

Method of shipment: UPS

Special detection Limit/reporting

Special QA/OC

Remarks: Please give verbal results to K. Wimmiller ASAP

Return original CofC with cARs

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	7/22/92	12:20	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory

Date: 7/23/92 Time: 12:10 P

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

APPC-3292 (2-91)

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 608-92-SC

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Keith Wiemiller	Laboratory name E.A.S.
ARCO engineer Mike Whelan	Telephone no. (ARCO) (415)571-2449	Telephone no. (Consultant) (408) 984-6536	Fax no. (Consultant) (408) 243-3911
Consultant name Pacific Environmental Group, Inc.	Address (Consultant) 1601 Civic Center Dr, Ste 202 Santa Clara, CA 95050		Contract number —

Method of shipment: UPS

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 gas 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 Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
AH+H	20964	1	~~Soil~~ Cart# A017	~~Water~~ Press 765	Air	—	—	7/22/92	8:15		X											

Special detection Limit/reporting:

Special QA/QC:

Remarks: Please give verbal results to K. Wiemiller ASAP.

Return original CofC with ARs.

Lab number:

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	7/22/92	12:20	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory

Date 7/23/92 Time 12:10p

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

APPC-3292 (2-91)

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 608-92-5C

Chain of Custody

ARCO Facility no. 0608	City (Facility) San Lorenzo	Project manager (Consultant) Keith Winemiller	Laboratory name EAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) (415)571-2449	Telephone no. (Consultant) (408)984-6536	Fax no. (Consultant) (408)243-3941
Consultant name Pacific Environmental Group, Inc	Address (Consultant) 1601 Civic Center Dr, Ste 202, Santa Clara, CA 95050		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 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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
~~Soil~~ Vapor	~~Water~~ Press	Other																				
W173492096S	1	1	A019	737	Air	—	—	7/22/92	9:09		X											

Special detection Limit/reporting

Special QA/QC

Remarks

Please give verbal results to K. Winemiller ASAP

Return Original COC with CARs

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	7/22/92	12:20	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory

Date 7/23/92 Time 12:10

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

APPC-3292 (2-91)

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Keith Winemiller

Project: 330-06.14/ARCO 0608, San Lorenzo

Enclosed are the results from 1 water sample received at Sequoia Analytical on July 22,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2073307	Water, GW17203	7/22/92	General Mineral, General Physical, & Inorganic Chemical Analysis

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

Very truly yours,

SEQUOIA ANALYTICAL

Christine L. Middleton
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group	Client Project ID:	330-06.14/ARCO 0608, San Lorenzo	Sampled:	Jul 22, 1992
2025 Gateway Place, Suite 440	Sample Descript:	Water, GW17203	Received:	Jul 22, 1992
San Jose, CA 95110			Analyzed:	7/23-30/92
Attention: Keith Winemiller	Lab Number:	207-3307	Reported:	Aug 4, 1992

GENERAL MINERAL, GENERAL PHYSICAL, & INORGANIC CHEMICAL ANALYSES

Analyte	Detection Limit mg/L (ppm)	Sample Results mg/L (ppm)
Aluminum	0.10	0.11
Arsenic	0.0050	0.0051
Barium	0.10	0.15
Bicarbonate Alkalinity	1.0	640
Cadmium	0.010	N.D.
Calcium	0.50	120
Carbonate Alkalinity	2.0	N.D.
Chloride	0.20	32
Chromium	0.010	N.D.
Color (color units)	3.0	5.0
Copper	0.010	0.014
Fluoride	0.10	0.25
Hardness	1.0	520
Hydroxide Alkalinity	0.10	N.D.
Iron	0.010	0.83
Lead	0.0050	N.D.
Magnesium	0.10	40
Manganese	0.010	3.8
Mercury	0.00020	N.D.
Nitrate as NO3	1.0	N.D.
Odor (threshold units)	1.0	50
pH (pH units)	N.A.	6.7
Potassium	1.0	N.D.
Selenium	0.0050	N.D.
Silver	0.010	N.D.
Sodium	0.50	67
Specific Conductance (µmhos/cm)	1.0	1,100
Sulfate	0.10	9.7
Surfactants	0.020	0.14
Total Dissolved Solids	1.0	560
Turbidity (NTU)	0.10	8.6
Zinc	0.010	0.11

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Christine L. Middleton
Project Manager

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Keith Winemiller

Client Project ID: 330-06.14/ARCO 0608, San Lorenzo

QC Sample Group: 207-3307

Reported: Aug 4, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Arsenic	Selenium	Mercury	Lead
Method:	EPA 206.2	EPA 270.2	EPA 245.1	EPA 239.2
Analyst:	F. Contreras	F. Contreras	J. Martinez	S. Chin
Reporting Units:	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Jul 29, 1992	Jul 29, 1992	Jul 24, 1992	Jul 30, 1992
QC Sample #:	207-3307	207-3307	207-3307	207-3307
Sample Conc.:	0.0051	N.D.	N.D.	N.D.
Spike Conc. Added:	0.25	0.25	0.0020	0.050
Conc. Matrix Spike:	0.24	0.25	0.0020	0.050
Matrix Spike % Recovery:	94	100	100	100
Conc. Matrix Spike Dup.:	0.26	0.28	0.0020	0.050
Matrix Spike Duplicate % Recovery:	102	112	100	100
Relative % Difference:	8.0	11	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Christine L. Middleton
Project Manager

% Recovery:	$\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}}$	x 100
Relative % Difference:	$\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}}$	x 100

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Keith Winemiller

Client Project ID: 330-06.14/ARCO 0608, San Lorenzo

QC Sample Group: 207-3307

Reported: Aug 4, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Barium	Cadmium	Chromium	Potassium	Sodium	Zinc	Copper
Method:	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
Analyst:	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser
Reporting Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992
QC Sample #:	207-3889	207-3889	207-3889	207-3889	207-3889	207-3889	207-3889
Sample Conc.:	0.14	N.D.	0.023	N.D.	190	0.25	0.14
Spike Conc. Added:	1.0	1.0	1.0	100	100	1.0	1.0
Conc. Matrix Spike:	1.2	0.95	1.0	82	270	1.2	1.1
Matrix Spike % Recovery:	106	95	98	82	80	95	96
Conc. Matrix Spike Dup.:	1.1	0.92	0.97	82	270	1.2	1.1
Matrix Spike Duplicate % Recovery:	96	92	95	82	80	95	96
Relative % Difference:	8.7	3.2	3.0	0.0	0.0	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Christine L. Middleton
Project Manager

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

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Keith Winemiller

Client Project ID: 330-06.14/ARCO 0608, San Lorenzo

QC Sample Group: 207-3307

Reported: Aug 4, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Iron	Magnesium	Manganese	Calcium	Aluminum	Silver
Method:	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
Analyst:	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser	C. Medefesser
Reporting Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992	Jul 29, 1992
QC Sample #:	207-3889	207-3889	207-3889	207-3889	207-3889	207-3889
Sample Conc.:	0.54	1.9	N.D.	8.6	0.41	N.D.
Spike Conc. Added:	1.0	1.0	1.0	100	1.0	1.0
Conc. Matrix Spike:	1.5	2.7	0.97	110	1.4	0.95
Matrix Spike % Recovery:	96	80	97	101	99	95
Conc. Matrix Spike Dup.:	1.5	2.8	0.94	110	1.4	0.92
Matrix Spike Duplicate % Recovery:	96	90	94	101	99	92
Relative % Difference:	0.0	3.6	3.1	0.0	0.0	3.2

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Christine L. Middleton
Project Manager

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

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Keith Winemiller

Client Project ID: 330-06.14/ARCO 0608, San Lorenzo

QC Sample Group: 207-3307

Reported: Aug 4, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Surfactants	Chloride	Nitrate	Sulfate	Alkalinity	Hardness
Method:	SM 512B	EPA 300.0	EPA 300.0	EPA 300.0	SM403	SM2340
Analyst:	M. Fazzio	G. Fish	G. Fish	G. Fish	G. Kern	G. Kern
Reporting Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Date Analyzed:	Jul 23, 1992	Jul 24, 1992	Jul 24, 1992	Jul 24, 1992	Jul 27, 1992	Jul 28, 1992
QC Sample #:	207-2870	Blank	Blank	Blank	207-3805	207-3707
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	140	N.D.
Spike Conc. Added:	0.050	1.0	1.0	1.0	N.A.	100
Conc. Matrix Spike:	0.059	1.1	0.94	0.92	N.A.	99
Matrix Spike % Recovery:	117	110	94	92	N.A.	99
Conc. Matrix Spike Dup.:	0.055	1.1	0.92	0.89	130	99
Matrix Spike Duplicate % Recovery:	110	110	92	89	N.A.	99
Relative % Difference:	7.0	0.0	2.2	3.3	7.4	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Christine L. Middleton
Project Manager

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

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

SEQUOIA ANALYTICAL

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

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Keith Winemiller

Client Project ID: 330-06.14/ARCO 0608, San Lorenzo

QC Sample Group: 207-3307

Reported: Aug 4, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Fluoride	Total Dissolved Solids	Conductivity	pH
Method:	EPA 340.2	EPA 160.1	EPA 120.1	EPA 9040
Analyst:	G. Fish	Y. Arteaga	Y. Arteaga	Y. Arteaga
Reporting Units:	mg/L	mg/L	µmhos/cm	N.A.
Date Analyzed:	Jul 23, 1992	Jul 24, 1992	Jul 23, 1992	Jul 23, 1992
QC Sample #:	207-3307	207-3307	207-3306	207-3332
Sample Conc.:	0.25	280	550	8.9
Spike Conc. Added:	1.0	220	710	N.A.
Conc. Matrix Spike:	1.1	540	1300	N.A.
Matrix Spike % Recovery:	85	118	105	N.A.
Conc. Matrix Spike Dup.:	1.1	540	1300	8.9
Matrix Spike Duplicate % Recovery:	85	118	105	N.A.
Relative % Difference:	0.0	0.0	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Christine L. Middleton
Project Manager

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