PRELIMINARY TANK REPLACEMENT ASSESSMENT

ARCO Facility No. 2162
15135 Hesperian Boulevard
San Leandro, California

August 28, 1991

Prepared for:

ARCO Products Company
P.O. Box 5811
San Mateo, California

Prepared by:

ROUX ASSOCIATES
1350 Arnold Drive, Suite 201
Martinez, CA 94553
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ROUX

Doc #A101W01.1.5

9/4

Noted E. P. SO. 9/4 SEP 4 1991

ENVIRONMENTAL CONSULTING & MANAGEMENT
ROUX ASSOCIATES

ROUX

1350 ARNOLD DRIVE
SUITE 201
MARTINEZ, CALIFORNIA 94553 415 370-2275 FAX # 415 370-2235

ES

Transmittal/Memorandum

To: Mr. Eddy So
Regional Water Quality Control Board
2101 Webster Street, Suite 500
Oakland, California 94612

Site Name ARCO
Site Address

From: Paul Supple PS

Date: August 28, 1991

Subject: Preliminary Tank Replacement Assessment
ARCO Facility No. 2162
15135 Hesperian Boulevard
San Leandro, California

Job No.: A101W01

Div. = ~~[redacted]~~ UST
LD = RI
Type = U
GWDP = 9'
MRSL = 2400 TPH-g ppm
Comment
8/28 PTRA

Remarks: Enclosed is one copy of the subject final report for your files.

---

cc: Mr. Chris Winsor, ARCO Products Company
Mr. Charles Carmel, ARCO Products Company
Mr. Joe Ferreira, San Leandro Fire Department

~~Letter reply~~

Call Paul Supple on 9/4 + ask ROUX send a copy of this report to ACHD ∵ soil contamination is > 100 ppm. ∵ the ACHD is our current LOP for subsurface investigation + remediation of soil/GW contamination caused by fuel leak from UST 9 advise him to contact ACHD directly for subsurface investigation.

TITLE: Preliminary Tank Replacement Assessment
ARCO Facility No. 2162
15135 Hesperian Boulevard
San Leandro, California

DATE: August 28, 1991

PROJECT NO: A101W01

SUBMITTED BY: Roux Associates
1350 Arnold Drive, Suite 201
Martinez, California 94553

This work was done under the direction of the undersigned California Registered Geologist.

PREPARED BY:

Keith G. Kennedy
California Registered Geologist No. 4903

Paul Supple
Senior Hydrogeologist

CONTENTS

TABLE

FIGURES

APPENDICES

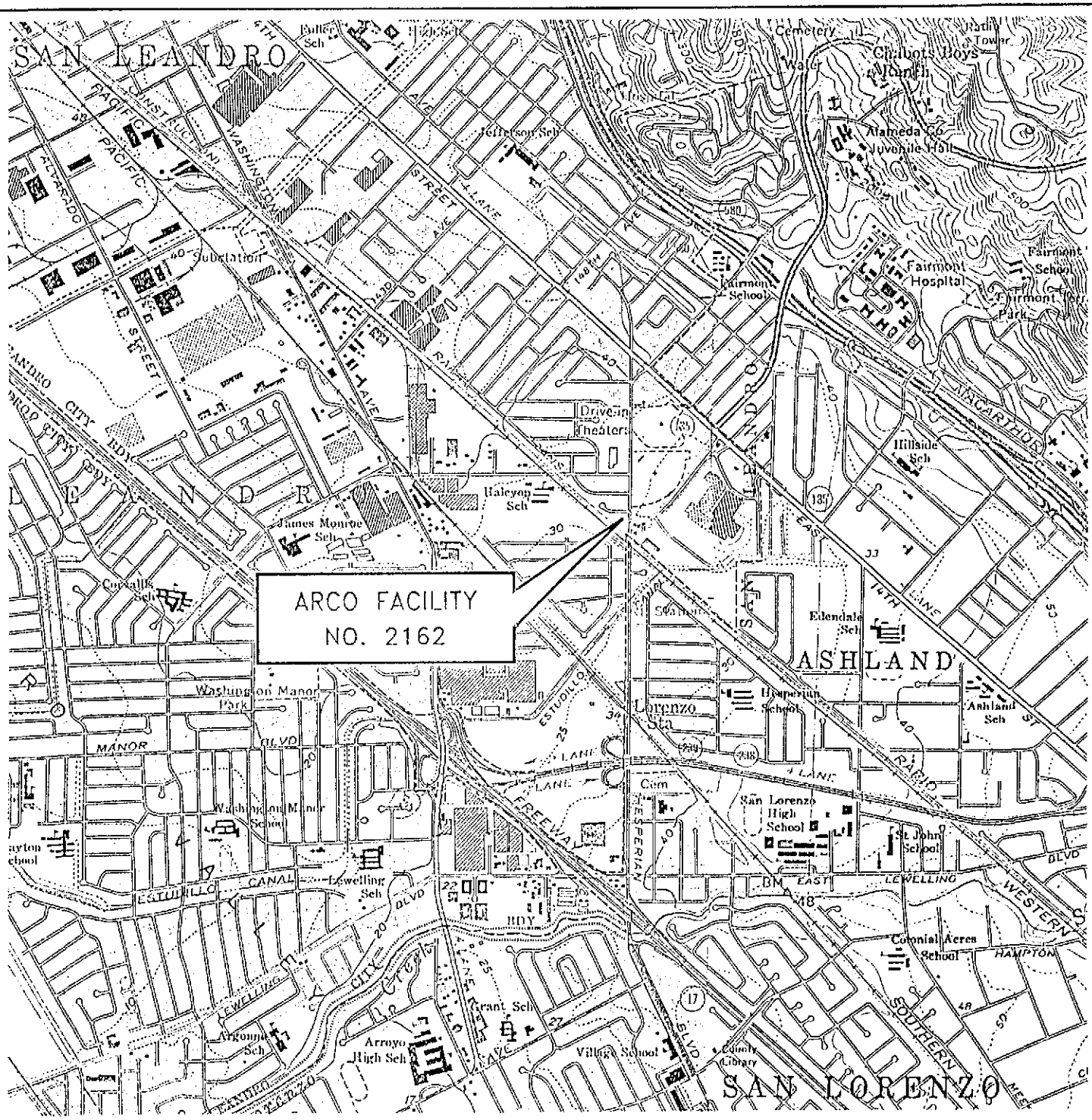
1.0 INTRODUCTION

This report describes the results of a preliminary tank replacement assessment (pre-drill) performed by Roux Associates (Roux) at ARCO Products Company (ARCO) Facility No. 2162 at 15135 Hesperian Boulevard, San Leandro, California (Site). The activities described in this report were carried out in accordance with ARCO's Retail Marketing Environmental Procedures for Preliminary Tank Replacement Assessment, San Francisco Region.

The field investigation was conducted on June 5, 1991 to evaluate potential levels of petroleum hydrocarbons in soil prior to planned replacement of underground storage tanks (USTs) at the Site. Seven soil borings were drilled on site. Undisturbed soil samples acquired during the drilling were submitted to a California State certified laboratory for analysis. Two vapor extraction test wells were installed into two of the boreholes at the Site. The remaining five boreholes were backfilled to grade. The work performed by Roux was conducted by Roux geologists under the direction of Mr. Keith Kennedy, California Registered Geologist No. 4903.

2.0 SITE DESCRIPTION

ARCO Facility No. 2162 is an operating auto repair and self-service gasoline station located at the southwest corner of Hesperian Boulevard and Ruth Court, San Leandro, California (Figure 1). The Site is a relatively flat asphalt and concrete covered lot, at an elevation of about 30 feet above mean sea level. The local topography is nearly flat, sloping very gently



SOURCE:

USGS 7.5 MINUTE QUADRANGLES OF
SAN LEANDRO, CALIFORNIA, 1968
AND
HAYWARD, CALIFORNIA, 1980.

N

0' 2,000'

ROUX ASSOCIATES, INC. ENVIRONMENTAL CONSULTING & MANAGEMENT	COMPILED BY: J.F.	PREPARED FOR: ARCO PRODUCTS COMPANY	FIGURE 1
	PREPARED BY: R.P.		
	PROJECT MNGR. B.T.	TITLE: LOCATION OF SITE ARCO FACILITY NO. 2162	
	DATE: 07/91		
	SCALE: AS SHOWN		
	REVISION: 0		
	PROJECT NO. A101W01		

(less than 1 percent slope) toward the southwest (U.S. Geological Survey, 1968). Currently located on the Site, are a service station building, two pump islands, and four USTs located in a common tank cavity in the northeastern part of the Site (Figure 2). ARCO plans to remove these USTs and install new double-wall USTs in the same location.

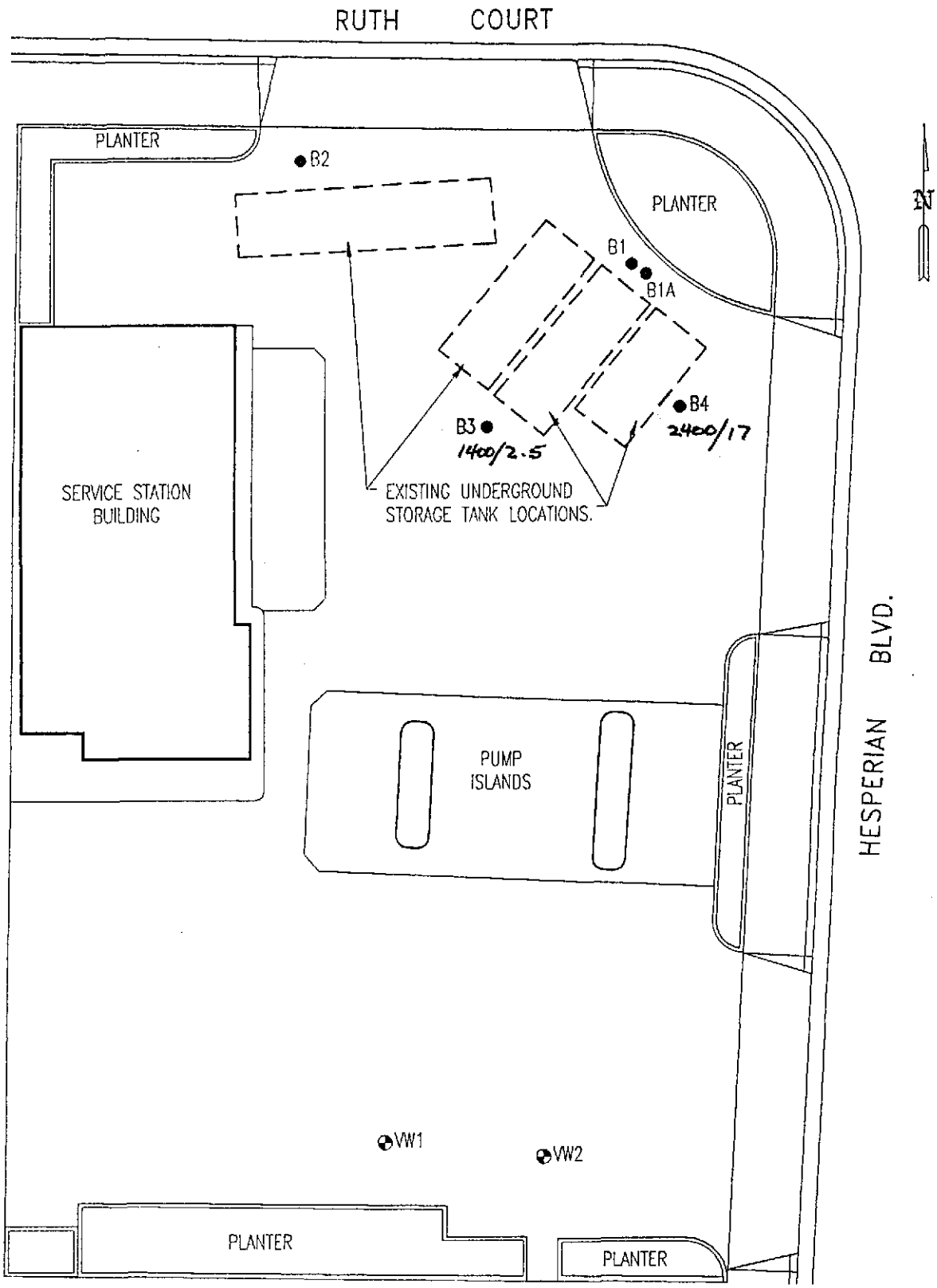
3.0 GEOLOGY

The Site is located in the San Francisco Bay Region of California. Shallow subsurface deposits in the region generally consist of a heterogeneous mixture of moderately to poorly sorted, clay, silt, sand, and gravel (Helley et al, 1979).

Geologic data derived from the seven boreholes drilled on-site indicated unconsolidated sediments consisting of interbedded silt and silty clay from land surface to a depth of 7 to 9 feet below ground surface (bgs). A sand and gravel unit underlies the silt and clay unit. Ground water was encountered in the boreholes at depths ranging from 9 to 10 feet (bgs). A silt unit underlying the sand and gravel unit was encountered in borehole B3 at a depth of 13 feet (bgs).

4.0 FIELD INVESTIGATION

Roux subcontracted Gregg Drilling and Testing, Inc. of Concord, California (Gregg) to drill soil borings on the Site to evaluate potential levels of petroleum hydrocarbons in soil prior



EXPLANATION

- ●B1 SOIL BORING LOCATIONS AND DESIGNATIONS.
- ◐VW1 VAPOR EXTRACTION TEST WELL LOCATIONS AND DESIGNATIONS.

0' 20' 40'

TPH-G/benzene @ 7.5' BG

ROUX ASSOCIATES, INC.
ENVIRONMENTAL CONSULTING & MANAGEMENT

COMPILED BY:	J.F.
PREPARED BY:	R.P.
PROJECT MNGR.	B.T.
DATE:	07/91
SCALE:	AS SHOWN
PROJECT NO.	A101W01
FILE NAME:	AR216201

PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE: LOCATION OF SOIL BORING AND UNDERGROUND STORAGE TANKS

ARCO FACILITY NO. 2162

FIGURE 2

to a planned replacement of USTs. The field investigation involved the drilling of seven soil borings, collection of undisturbed soil samples and installation of two vapor extraction test wells. The wells will be used to evaluate the feasibility of using vapor extraction techniques at the Site (Figure 2).

4.1 Soil Borings and Sampling

Drilling was performed by Gregg under the direct supervision of a Roux geologist. Five soil borings (B1, B1A, B2, B3, and B4) were drilled adjacent to the existing USTs to a depth ranging from 9 to 15 feet bgs. Soil borings B1 and B1A were located near the fill end of the existing USTs, and borings B2, B3 and B4 were located along the other sides of the tank complex (Figure 2). Soil borings VW1 and VW2 were drilled at the south side of the Site to depths of 10.5 feet and 9.8 feet bgs.

Prior to drilling, boreholes were advanced with a hand auger to a depth of at least three feet. The soil borings were then drilled using six-inch outside diameter, hollow stem augers.

Soil samples from the boreholes were collected at three to five foot intervals using a 2.5-inch outside diameter California modified split-spoon sampler lined with three, 2-inch by 6-inch clean brass sample tubes. The sampler was driven into the soil ahead of the augers with a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler each six inches was recorded, as was the amount of soil recovered by the sampler. The soil boring logs are in Appendix A. Soil samples were not collected from soil boring VW2.

Immediately after the sampler was recovered from the borehole, one of the three brass sampling tubes was selected for possible laboratory analysis. The ends of this sample tube were covered with aluminum foil, a plastic cap and sealed with duct tape. The sample tube was labeled with the location, time, date, sample identification number, and sampler's initials. The sample was then placed in a plastic bag and stored on ice in a closed cooler chest until delivery to the laboratory. Chain-of-custody documentation was maintained for all samples (Appendix B).

The contents of another sample tube were sealed in a plastic bag and placed in the direct sunlight to accelerate the volatilization of any hydrocarbons in the soil. An organic vapor meter (OVM) was used to measure the qualitative relative concentration of volatile organic compounds (VOCs) in the plastic bag. Measurements from the OVM are included on the boring logs in Appendix A.

The contents of the remaining sample tubes were examined by the field geologist. Descriptions of the soil and classification were made according to the Unified Soil Classification System (USCS) and are on the soil boring logs (Appendix A). **Separate phase petroleum hydrocarbons were observed in soil samples collected from boreholes B3 and B4 at a depth ranging from about seven feet to ten feet bgs.** Separate phase petroleum hydrocarbons were not observed in any of the other soil borings.

All of the soil borings, except the two vapor extraction test wells, were backfilled with bentonite grout to within two feet of the surface, and then by concrete to grade.

4.2 Laboratory Analyses

Soil samples collected from the soil borings were delivered for chemical analyses to Sequoia Analytical (Sequoia) of Concord, California, a California State certified laboratory. Ten soil samples from the boreholes were analyzed for total petroleum hydrocarbons as low to medium boiling point hydrocarbons (TPH-G) and benzene, toluene, ethylbenzene and xylenes (BTEX) by modified U.S. Environmental Protection Agency (USEPA) Methods 8015 and 8020, respectively. **Two soil samples from each of borings B2, B3, B4 and VW1 and one soil sample from each of borings B1 and B1A were submitted for chemical analyses.** Table 1 summarizes the analytical data from the borehole soil samples. Laboratory analytical reports are in Appendix C.

4.3 Vapor Extraction Test Wells

Two vapor extraction test wells (VW1 and VW2) were installed on the south side of the Site (Figure 2). These wells were installed to conduct a limited soil performance test (LSPT) to determine the feasibility of using vapor extraction techniques at the Site. **Findings of the LSPT conducted on June 6, 1991 were prepared in a separate letter report by Roux (Roux,** 1991).

Both vapor extraction wells were constructed of 2-inch diameter PVC pipe screened over the interval from four to nine feet bgs. The screened zone was backfilled with a sand filter pack using (Number 3 sand). One foot of bentonite chips were placed above the sand pack. The remaining space was then filled with cement to within one foot of the surface. A

TABLE 1: Summary of Soil Sample Analytical Data
ARCO Facility No. 2162, San Leandro, California

Sample Designation	Date	Depth (feet bgs)	TPH-G(1)	BTEX Distinction(1)			
				Benzene	Toluene	Ethylbenzene	Xylenes
B1-5	6/5/91	5	ND	ND	ND	ND	0.016
B1A-7.5	6/5/91	7.5	43	0.14	0.93	1.1	7.8
B2-5	6/5/91	5	1.3	ND	ND	ND	0.018
B2-9	6/5/91	9	ND	ND	ND	ND	ND
B3-4	6/5/91	4	26	0.024	0.029	0.16	1.1
B3-7.5	6/5/91	7.5	1400	2.5	4.4	29	190
B4-4.5	6/5/91	4.5	ND	0.025	0.013	0.0085	0.042
B4-7.5	6/5/91	7.5	2400	17	62	41	260
VW1-6	6/5/91	6	2.8	0.033	0.0073	0.079	0.055
VW1-9	6/5/91	9	100	0.48	1.4	2.7	4.1

FOOTNOTES:

(1) = Concentrations reported in mg/kg (ppm)

TPH-G =Total Petroleum Fuel Hydrocarbons As Low/Medium Boiling Point Hydrocarbons (USEPA 8015)

BTEX Distinction (USEPA 8020)

ND = Not Detected (For detection limits see laboratory reports, Appendix C)

bgs = below ground surface

surface utility box with a PVC apron was placed over the well and set in concrete. The utility box was emplaced slightly above the surrounding ground surface and covered with a watertight lid. The top of each well casing was secured with a two-inch diameter, watertight, locking well cap. The vapor extraction well construction details for VW1 and VW2 are on the soil boring logs in Appendix A.

5.0 SUMMARY OF FINDINGS

The following summary outlines data collected during the pre-drill investigation at ARCO Facility No. 2162 in San Leandro, California.

1) The Site is underlain by alluvial material consisting of interbedded silt and silty clay layers from 7 to 9 feet bgs. **Underlying the silt and silty clay layers is a sequence of sand and gravel. A silt unit underlying the sand and gravel unit occurred at about 13 feet bgs in boring B4.**

2) Ground water was encountered in the boreholes at depths ranging from 9 to 10 feet bgs.

3) Separate phase petroleum hydrocarbons were observed in soil samples collected from boreholes B3 and B4 at a depth ranging from 7 to 10 feet bgs.

4) Laboratory analyses of soil samples collected at depths ranging from 4 to 7.5 bgs in soil boring B3 and B4 indicated TPH-G concentrations from not detected to 2,400 mg/kg. Benzene concentrations ranged from 0.0024 mg/kg to 17 mg/kg. The greater TPH-G and BTEX concentrations were detected in the deeper soil samples collected at 7.5 feet bgs.

5) Laboratory analyses of soil samples collected at depths ranging from 5 to 9 feet bgs in soil borings B1, B1A and B4 indicated TPH-G concentrations from not detected to 43 mg/kg (Table 1). Benzene was only detected in soil sample B1A-7.5 at a concentration of 0.14 mg/kg.

6) Laboratory analyses of the two soil samples collected at depths of 6 and 9 feet bgs from boring VW1 indicated concentrations of TPH-G at 2.8 mg/kg and 100 mg/kg, respectively. Benzene was detected in both the 6 and 9 foot samples at 0.033 mg/kg and 0.48 mg/kg, respectively.

6.0 REFERENCES

Helley, E.J., and K.R. Lajoie, 1979, Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning. USGS Professional Paper 943.

Roux Associates, 1991, Limited Soil Performance Test, ARCO Facility No. 2162, 15135 Hesperian Boulevard, San Leandro, California.

U.S. Geological Survey, 1968, San Leandro, California 7.5-minute topographic quadrangle map.

U.S. Geological Survey, 1980, Hayward, California 7.5-minute topographic quadrangle map.

ROUX

SYMBOL KEY

LITHOLOGIC SYMBOL KEY
(Unified Soil Classification System)


Fill


SW Well Graded Sand


SP Poorly Graded Sand


SM Silty Sand


SC Clayey Sand


PT Peat


OL Low Plasticity Organic Silt


OH High Plasticity Organic Silt


ML Low Plasticity Silt


MH High Plasticity Silt


GW Well Graded Gravel


GP Poorly Graded Gravel


GM Silty Gravel


GC Clayey Gravel


CL Low Plasticity Clay


CH High Plasticity Clay

SAMPLER SYMBOL KEY

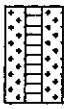

Continuous Core Barrel

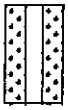

Standard Penetration Test


Modified California Sampler

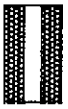

Shelby Sampler

WELL CONSTRUCTION SYMBOL KEY


Sand Pack w/Slotted Casing


Sand Pack


Concrete Grout/Fill


Bentonite Grout/Seal


Cement/Bentonite Grout

NE Ground Water Not Encountered


Water Level at Time of Drilling.


Stabilized Water Level.

ROUX

Project: ARCO FACILITY NUMBER 2162 15135 Hesperian Blvd, San Leandro, CA		Log of Soil Boring No. B1	
Logged By: Jon Florez	Checked By: L.E.	Date Started: 6/5/91	Date Completed: 6/5/91
Drilling Co: Gregg Drilling		Drill Bit Diameter: 6 inches	Total Depth: 11.5 ft
Driller: S. Stone		Backfill Material: Bentonite Grout	from 0 ft to 11.5 ft ft
Drilling Method: Hollow Stem Auger		Sampler: CA Modified Split-spoon	
Drilling Equipment: Mobile B-53		Depth to Water at Time of Drilling: 9.5 ft	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sample	Blow Counts	OVM (ppm)	REMARKS
	Asphalt & baserock Pea gravel					
	CLAY, Silty, black-brown.	OL				
	CLAY, Silty, brown.	CL				
5	CLAY, Silty, green-grey, little medium(-) sand, slight hydrocarbon odor	OL		6-9-12		No Recovery For OVM
		SM ▽				
10	SAND, medium Silty, green-brown, some fine gravel, wet, strong hydrocarbon odor.			2-3-4	3.3	
15						

ROUX

Project: ARCO FACILITY NUMBER 2162 15135 Hesperian Blvd, San Leandro, CA		Log of Soil Boring No. **B1A**	
Logged By: **Jon Florez**	Checked By: **L.E.**	Date Started: **6/5/91**	Date Completed: **6/5/91**
Drilling Co: **Gregg Drilling**		Drill Bit Diameter: **6 inches**	Total Depth: **9.0 ft**
Driller: **S. Stone**		Backfill Material: **Bentonite Grout**	from **0 ft** to **9.0 ft ft**
Drilling Method: **Hollow Stem Auger**		Sampler: **CA Modified Split-spoon**	
Drilling Equipment: **Mobile B-53**		Depth to Water at Time of Drilling:	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sample	Blow Counts	OVM (ppm)	REMARKS
	Asphalt & baserock					
	Pea gravel					
	CLAY, Silty, black-brown.	OL				
	CLAY, Silty, brown.	CL				
5	CLAY, Silty, green-grey, little medium(-) sand, slight hydrocarbon odor.	OL				
	SILT, clayey, dark brown, light brown mottling, moderate to strong hydorcarbon odor.	MH		6-9-12		OVM Malfunction
10						
15						

ROUX

Project: **ARCO FACILITY NUMBER 2162** **15135 Hesperian Blvd, San Leandro, CA**	**Log of Soil Boring No. B2**
Logged By: **Jon Florez** Checked By: **L.E.**	Date Started: **6/5/91** Date Completed: **6/5/91**
Drilling Co: **Gregg Drilling**	Drill Bit Diameter: **6 inches** Total Depth: **9.5 ft**
Driller: **S. Stone**	Backfill Material: **Bentonite Grout** from **0 ft** to **9.5 ft ft**
Drilling Method: **Hollow Stem Auger**	Sampler: **CA Modified Split-spoon**
Drilling Equipment: **Mobile B-53**	Depth to Water at Time of Drilling: **9.0 ft**

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sample	Blow Counts	OVM (ppm)	REMARKS
	Asphalt & baserock Pea gravel					
	CLAY, Silty, black.	OL				
5	**SILT**, Sandy, brown-green with orange mottling, damp, few rootlets, mild hydrocarbon odor.	ML		4-7-10	76.7	
		SP		5-4-10	10.5	
	SAND, medium to fine(+), green, and fine(-) gravel, moist, mild hydrocarbon odor.					
10						
15						

ROUX

Project: ARCO FACILITY NUMBER 2162 15135 Hesperian Blvd, San Leandro, CA		Log of Soil Boring No. B3	
Logged By: Jon Florez	Checked By: L.E.	Date Started: 6/5/91	Date Completed: 6/5/91
Drilling Co: Gregg Drilling		Drill Bit Diameter: 6 inches	Total Depth: 10.5 ft
Driller: S. Stone		Backfill Material: Bentonite Grout	from 0 ft to 10.5 ft ft
Drilling Method: Hollow Stem Auger		Sampler: CA Modified Split-spoon	
Drilling Equipment: Mobile B-53		Depth to Water at Time of Drilling: 10.0 ft	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sample	Blow Counts	OVM (ppm)	REMARKS
	Asphalt & baserock					
	GRAVEL, Sandy, with lens of white medium sand.					
	SILT, Clayey, black, organic odor? SILT, brown-orange , trace lenses of fine gravel. SILT, Clayey, black, with piece of glass.					
		OL				
	SILT, greenish-black to dark brown, trace shell fragments, trace medium sand, very slight odor.			4-7-12	10.5	
5						
		CL				
	CLAY, silty, green-brown, 1-2 inch lense of green sand at top of sampler, moist, trace of separate phase petroleum hydrocarbon.			3-6-8	207.5	
	SAND, medium(+), green, little silt, wet.	SW		4-6-10		No Recovery For OVM
10						
15						

ROUX

Project: ARCO FACILITY NUMBER 2162 15135 Hesperian Blvd, San Leandro, CA		Log of Soil Boring No. B4	
Logged By: Jon Florez	Checked By: L.E.	Date Started: 6/5/91	Date Completed: 6/5/91
Drilling Co: Gregg Drilling		Drill Bit Diameter: 6 inches	Total Depth: 15.0 ft
Driller: S. Stone		Backfill Material: Bentonite Grout	from 0 ft to 15.0 ft ft
Drilling Method: Hollow Stem Auger		Sampler: CA Modified Split-spoon	
Drilling Equipment: Mobile B-53		Depth to Water at Time of Drilling: 9.5 ft	

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Sample	Blow Counts	OVM (ppm)	REMARKS
	Asphalt & baserock					
	SAND, medium, yellow.					
	SILT, Clayey, black.					
	SILT, Sandy, brown-green, and gravel.					
	SILT, black, trace fine gravel.					
	SILT, green with brown mottling, trace fine sand, trace rootlets, slight hydrocarbon odor.	OL		4-6-8	10.5	
5						
	SILT, green-grey, moist, strong hydrocarbon odor, trace dark brown to black separate phase petroleum hydrocarbon.			4-8-8	992	
	1/2-inch thick lens of medium to fine, green-grey gravel					
	SAND, fine, green-grey, wet.	SM		4-3-8		
	GRAVEL, medium to fine, green-grey, and fine sand, wet, trace brown separate phase petroleum hydrocarbon.	GP				
10	GRAVEL, medium, green-grey, wet, trace brown separate phase petroleum hydrocarbon.					
	SAND, fine, wet, separate phase petroleum hydrocarbon noted.	SM		7-17-5		
	GRAVEL, fine, green, wet, separate phase petroleum hydrocarbon noted.	GP				
	SAND, medium, brown, and fine gravel, wet, separate phase petroleum hydrocarbon noted.	SP				
	GRAVEL, medium to fine, green-grey, and fine sand, wet, slight hydrocarbon odor.	GM		2-3-5		
	SILT, brown-orange with dark brown mottling, moist, no odor noted.	ML				
	SILT, brown, trace medium flecks of black organic matter, damp.			3-4-6		
15						

ROUX

Project: **ARCO FACILITY NUMBER 2162** **15135 Hesperian Blvd, San Leandro, CA**	**Log of Well No. VW1**
Date Started: **6/5/91** Completed: **6/5/91**	Measuring Point Elevation: **30 ft** Total Depth: **10.5 ft**
Logged By: **Jonathan Florez** Checked By: **L.E.**	Water Level During Drilling: **10.0 ft** Stabilized: **ft**
Drilling Co: **Gregg Drilling** Driller: **S. Stone**	Casing: **2" sched. 40 PVC** Drill Bit Diameter: **6 inches**
Drilling Method: **Hollow Stem Auger**	Perforation: **0.020 Slotted PVC** from **8.7 ft** to **3.7 ft**
Drilling Equipment: **Mobile B-53**	Pack: **#3 Monterey Sand** from **9.0 ft** to **3.3 ft**
Sampler: **CA Modified Split-spoon**	Seal: **Bentonite Chips** from **3.3 ft** to **2.3 ft** **Cement/Bentonite Grout** from **2.3 ft** to **0 ft**

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Monitoring Well Construction	Sample	Blow Counts	OVM (ppm)	REMARKS
	Asphalt & baserock						
	SAND, medium to fine, brown, and medium to fine(+) gravel.						
	SILT, Clayey, black, trace fine sand.	OL					
	SILT, Clayey, black, trace 2mm. brown needles.				5-13-16		OVM Malfunction
	SILT, Sandy, green, moist, rootlet fragments.						
5					6-8-7		OVM Malfunction
	SAND, coarse to fine(+), green, little fine gravel, moist.	SW					
	SAND, Silty(+) to clayey, green, moist.	SM					
					3-6-8		OVM Malfunction
10							1.5-foot thick bentonite seal below vapor extraction well
15							

ROUX

Project: **ARCO FACILITY NUMBER 2162** **15135 Hesperian Blvd, San Leandro, CA**	Log of Well No. **VW2**
Date Started: **6/5/91** Completed: **6/5/91**	Measuring Point Elevation: **30 ft** Total Depth: **9.8 ft**
Logged By: **Jonathan Florez** Checked By: **L.E.**	Water Level During Drilling: **9.8 ft** Stabilized: **ft**
Drilling Co: **Gregg Drilling** Driller: **S. Stone**	Casing: **2" sched. 40 PVC** Drill Bit Diameter: **6 inches**
Drilling Method: **Hollow Stem Auger**	Perforation: **0.020 Slotted PVC** from **9 ft** to **4 ft**
Drilling Equipment: **Mobile B-53**	Pack: **#3 Monterey Sand** from **9.3 ft** to **3.7 ft**
Sampler: **Cuttings**	Seal: **Bentonite Chips** from **3.7 ft** to **2.7 ft**
	Cement/Bentonite Grout from **2.7 ft** to **0 ft**

Depth (feet)	LITHOLOGIC DESCRIPTION	Lithology	Monitoring Well Construction	Sample	Blow Counts	OVM (ppm)	REMARKS
	Asphalt & baserock						
	SAND, medium to fine, brown, and fine gravel.						
	SILT, Clayey, black.	OL					
5							
	SILT, Clayey, green.						
							0.5-foot thick bentonite seal below vapor extraction well
10							
15							

ENVIRONMENTAL CONSULTING & MANAGEMENT
ROUX ASSOCIATES

1350 ARNOLD DRIVE
SUITE 201
MARTINEZ, CALIFORNIA 94553 415 370-2275 FAX # 415 370-2235

Transmittal/Memorandum

To: Mr. Ariu Levi
Alameda County
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

From: Paul Supple PS

Date: September 5, 1991

Subject: Preliminary Tank Replacement Assessment
ARCO Facility No. 2162
15135 Hesperian Boulevard
San Leandro, California

Job No.: A101W01

Remarks: Enclosed is one copy of the subject final report for your files, at the request of Eddy So, Regional Water Quality Control Board.

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cc: Mr. Chris Winsor, ARCO Products Company
Mr. Charles Carmel, ARCO Products Company
Mr. Joe Ferreira, San Leandro Fire Department
Mr. Eddy So, Regional Water Quality Control Board

Doc #A101W01.1.5

APPENDIX B

Chain-of-Custody Documentation

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. [redacted]

Chain of Custody [redacted]

ARCO Facility no. 2162	City (Facility) San Leandro	Project manager (Consultant) Brian Thomas	Laboratory name Sequoia Analytical
ARCO engineer Mr. Chuck Carmel	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) (415) 370-2275	Fax no. (Consultant) (415) 370-2275
Consultant name Roux Associates, Inc.	Address (Consultant) 1350 Arnold Dr. Suite 201, Martinez, CA 94533		Contract number

Method of shipment: Hand Delivery

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 Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
B1-5			X			X		6/5/91	0845		X	100		097						
B1A-7.5			X			X			1305		X			098						
B2-5			X			X			0950		X			099						
B2-9			X			X			0955		X			100						
B3-4			X			X			1039		X			101						
B3-7.5			X			X			1050		X			102						
B4-4.5			X			X			1145		X			103						
B4-7.5			X			X			1156		X			104						
VW1-6			X			X		6/5/91	1350		X			105						
VW1-9			X			X		6/5/91	1355		X			106						
DC-1(A→D)			X			X		6/5/91	1635		X			107 A-D						X

Special detection Limit/reporting:

Special QA/QC:

Remarks:

Lab number:

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

Condition of sample: Seals intact, packed on ice

Temperature received: cold

Relinquished by sampler	Date	Time	Received by
Jonathan Hoke	6-6-91	1025	
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory
			Date: 6-6-91 Time: 1025

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

APPENDIX C

Laboratory Analytical Reports

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

oux Associates	Client Project ID:	ARCO #2162 / San Leandro	Sampled:	Jun 5, 1991
340 Arnold Drive, Suite 231	Matrix Descript:	Soil	Received:	Jun 6, 1991
Martinez, CA 94553	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 19, 1991
Attention: Brian Thomas	First Sample #:	106-0097	Reported:	Jun 21, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
106-0097	B1-5	N.D.	N.D.	N.D.	N.D.	0.016
106-0098	B1A-7.5	43	0.14	0.93	1.1	7.8
106-0099	B2-5	1.3	N.D.	N.D.	N.D.	0.018
106-0100	B2-9	N.D.	N.D.	N.D.	N.D.	N.D.
106-0103	B4-4.5	N.D.	0.025	0.013	0.0085	0.042
106-0105	VW1-6	2.8	0.033	0.0073	0.079	0.055
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Roux Associates	Client Project ID:	ARCO #2162 / San Leandro	Sampled:	Jun 5, 1991
340 Arnold Drive, Suite 231	Matrix Descript:	Soil	Received:	Jun 6, 1991
Martinez, CA 94553	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 19, 1991
Attention: Brian Thomas	First Sample #:	106-0101	Reported:	Jun 21, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
106-0101	B3-4	26	0.024	0.029	0.16	1.1
Detection Limits:		**2.0**	**0.010**	**0.010**	**0.010**	**0.010**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1060097.RRR <2>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Roux Associates	Client Project ID:	ARCO #2162 / San Leandro	Sampled:	Jun 5, 1991
340 Arnold Drive, Suite 231	Matrix Descript:	Soil	Received:	Jun 6, 1991
Martinez, CA 94553	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 19, 1991
Attention: Brian Thomas	First Sample #:	106-0102	Reported:	Jun 21, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
106-0102	B3-7.5	1,400	2.5	4.4	29	190
106-0104	B4-7.5	2,400	17	62	41	260
Detection Limits:		**100**	**0.50**	**0.50**	**0.50**	**0.50**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

1060097.RRR <3>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Roux Associates	Client Project ID:	ARCO #2162 / San Leandro	Sampled:	Jun 5, 1991
340 Arnold Drive, Suite 231	Matrix Descript:	Soil	Received:	Jun 6, 1991
Martinez, CA 94553	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jun 19, 1991
Attention: Brian Thomas	First Sample #:	106-0106	Reported:	Jun 21, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
106-0106	VW1-9	100	0.48	1.4	2.7	4.1
Detection Limits:		**10**	**0.050**	**0.050**	**0.050**	**0.050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Julia R. Malerstein
Project Manager

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(415) 686-9600 • FAX (415) 686-9689

Roux Associates
1340 Arnold Drive, Suite 231
Martinez, CA 94553
Attention: Brian Thomas

Client Project ID: ARCO #2162 / San Leandro

QC Sample Group: 1060097-107

Reported: Jun 21, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA8015/8020	EPA8015/8020	EPA8015/8020	EPA8015/8020
Analyst:	R.H./J.F.	R.H./J.F.	R.H./J.F.	R.H./J.F.
Reporting Units:	ppm	ppm	ppm	ppm
Date Analyzed:	Jun 20, 1991	Jun 20, 1991	Jun 20, 1991	Jun 20, 1991
QC Sample #:	BLK062091	BLK062091	BLK062091	BLK062091
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2
Conc. Matrix Spike:	0.42	0.44	0.43	1.4
Matrix Spike % Recovery:	110	110	110	120
Conc. Matrix Spike Dup.:	0.43	0.43	0.44	1.4
Matrix Spike Duplicate % Recovery:	110	110	110	120
Relative % Difference:	2.4	2.3	2.3	0

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

SEQUOIA ANALYTICAL

Julia R. Malerstein
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