



Alameda County
JAN 31 2003
Environmental Health

January 27, 2003

Ms. Eva Chu
Hazardous Waste Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

**Re: Second Quarter 2002 Groundwater Monitoring Report
ARCO Station #6148
5131 Shattuck Avenue
Oakland, California
URS Project #38465989**

Dear Ms. Chu:

On behalf of Atlantic Richfield Company (ARCO-an affiliated company of the Group Environmental Management Company), URS Corporation (URS) is submitting the *Second Quarter 2002 Groundwater Monitoring Report* for the ARCO Service Station #6148, located at 5131 Shattuck Avenue, California.

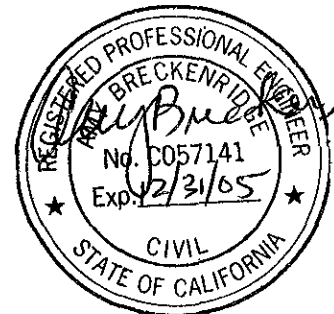
If you have any questions regarding this submission, please call me at (510) 874-3280.

Sincerely,

URS CORPORATION

Scott Robinson
Project Manager

Amy Breckenridge, P.E.
Portfolio Manager



Attachment: Second Quarter 2002 Groundwater Monitoring Report

cc: Mr. Paul Supple, ARCO, PO Box 6549, California 94570

R E P O R T

**SECOND QUARTER 2002
GROUNDWATER MONITORING**

ARCO SERVICE STATION #6148
5131 SHATTUCK AVENUE
OAKLAND, CALIFORNIA

Prepared for
Atlantic Richfield Company

January 27, 2003

URS

URS Corporation
500 12th Street, Suite 200
Oakland, California 94607

38465989



Date: January 27, 2003

Quarter: 2Q02

ATLANTIC RICHFIELD COMPANY QUARTERLY GROUNDWATER MONITORING REPORT

Facility No.: 6148 Address: 5131 Shattuck Avenue, Oakland, California
Atlantic Richfield Co. Environmental Engineer: Paul Supple
Consulting Co./Contact Person: URS Corporation/Scott Robinson/(510) 874-3280
Consultant Project No.: 38465989
Primary Agency/Regulatory ID No.: Alameda County Health Care Services Agency

WORK PERFORMED THIS QUARTER (Second – 2002):

1. Site transferred from Delta Environmental Consultants Inc. to URS Corporation.
2. Delta prepared and submitted first quarter 2002 groundwater monitoring report.
3. Delta performed second quarter monitoring event.

WORK PROPOSED FOR NEXT QUARTER (Third – 2002):

1. Perform third quarter 2002 groundwater monitoring event.
2. Prepare and submit second quarter 2002 groundwater monitoring report.

Current Phase of Project: GW monitoring/sampling/remediation
Frequency of Groundwater Sampling: Annual (1st Quarter): MW-6, MW-7
Semi-Annual (1st/3rd Quarter): MW-4
Quarterly: MW-1, MW-2, MW-3, MW-5
Frequency of Groundwater Monitoring: Quarterly (Groundwater)
Monthly (SVE and AS System)
Is Free Product (FP) Present On-Site: No
FP Recovered this Quarter: None
Cumulative FP Recovered to Date: None
Bulk Soil Removed this Quarter: None
Bulk Soil Removed to Date: 560 Cubic Yards of TPH Impacted Soils
Cumulative TPH-g/Benzene Removed: 929 / 7.0 gallons
Current Remediation Techniques: SVE/AS System
Approximate Depth to Groundwater: 12.45 (MW-6) to 16.25 (MW-1 and MW-3) feet
Groundwater Gradient (direction): Southwest
Groundwater Gradient (magnitude): 0.02 feet per foot

DISCUSSION:

MTBE was detected in wells MW-2 and MW-3 at concentrations of 10 micrograms per liter ($\mu\text{g/L}$) and 12 $\mu\text{g/L}$, respectively. TPH-g and benzene were detected in well MW-3 at concentrations of 360 $\mu\text{g/L}$ and 2.5 $\mu\text{g/L}$, respectively. The remediation systems have been non-operational since March 2000. No current tables of operational data have been provided due to the non-operational status of the system. Please refer to Attachment C for historical operational data of the remediation system.



ATTACHMENTS:

- Table 1 – Groundwater Elevation and Analytical Data
- Table 2 – Groundwater Flow Direction and Gradient
- Figure 1 – Groundwater Elevation Contour and Analytical Summary Map – April 17, 2002
- Attachment A – Field Procedures
- Attachment B – Laboratory Procedures, Certified Analytical Reports, and Chain-of-Custody Records
- Attachment C – Historic Groundwater Data and SVE System Operation Data
- Attachment D - EDCC Report and EDF/Geowell Submittal Confirmation



SVE QUARTERLY OPERATION & PERFORMANCE:

Equipment Inventory:	Therm Tech Model CATV/AC-10E Electric/CatOx
Operating Mode:	Catalytic Oxidation
RAAQMD Permit No.:	25126
TPH Conc. At End of Period (lab):	System has not run since March 2000
Benzene Conc. At End of Period (lab):	NA
Flow Rate at End of Period:	NA
Hydrocarbons Destroyed This Period:	NA
Hydrocarbons Destroyed to Date:	1,894.1
Utility Usage Electric (kWh):	NA
Operating Hours This Period:	0
Percent Operational:	0%
Operating Hours To Date:	2,470.77 hours
Unit Maintenance:	Routine Maintenance When Operational
Number of Auto Shut Downs:	0
Destruction of Efficiency Permit Requirements:	95% (POC >1,000 ppmv); 90% (POC <1000 ppmv) waived if outlet POC <1.0 lb/day and benzene <0.02 lb/day
Average Percent TPH Conversion:	Waived
Average Source Flow:	NA
Average Process Flow:	NA
Average Source Vacuum:	NA

TABLE 1

SUMMARY OF GROUNDWATER ELEVATION AND ANALYTICAL DATA

ARCO Service Station No. 6148
5131 Shattuck Avenue
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
MW-1	06/21/00	107.80	17.49	90.31	<0.5	<0.5	<0.5	<1.0	<50	<3.0
	09/20/00		17.64	90.16	<0.5	0.677	<0.5	0.969	<50	<2.5
	12/22/00		16.87	90.93	5.38	0.522	9.52	30.2	186	8.91
	03/26/01		16.60	91.20	<0.5	<0.5	<0.5	<0.5	<50	9.1
	05/30/01		17.10	90.70	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	09/23/01		17.53	90.27	<0.5	<0.5	<0.5	<0.5	<50	6.7
	12/28/01		15.57	92.23	2.7	<0.5	<0.5	<0.5	<50	20
	03/21/02		15.57	92.23	NS	NS	NS	NS	NS	NS
	04/17/02			16.25	91.55	<0.5	<0.5	<0.5	<0.5	<50
MW-2	06/21/00	107.28	17.19	90.09	<0.5	<0.5	<0.5	<1.0	69	12
	09/20/00		17.31	89.97	0.964	<0.5	<0.5	<0.5	<50	5.05
	12/22/00		16.58	90.70	174	60.2	118	438	2,140	123
	03/26/01		16.45	90.83	333	148	495	1,660	8,490	<250
	05/30/01		16.83	90.45	200	71	260	780	4,700	43
	09/23/01		17.30	89.98	5.9	1.8	0.80	41	160	14
	12/28/01		15.38	91.90	54	<5.0	<5.0	240	1,800	30
	03/21/02		15.36	91.92	NS	NS	NS	NS	NS	NS
	04/17/02			16.01	91.27	<0.5	<0.5	<0.5	<0.5	<50

TABLE 1

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ARCO Service Station No. 6148
5131 Shattuck Avenue
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
MW-3	06/21/00	107.61	17.52	90.09	<0.5	<0.5	<0.5	2.1	200	24
	09/20/00		17.61	90.00	<0.5	<0.5	<0.5	<0.5	<50	20
	12/22/00		16.85	90.76	4.73	1.06	2.58	5.22	227	27.3
	03/26/01		16.79	90.82	6.29	1.58	6.47	12.1	287	24.2
	05/30/01		17.11	90.50	10	<0.5	7.00	16	500	20
	09/23/01		17.57	90.04	6.4	0.74	<0.5	0.62	400	22
	12/28/01		15.41	92.20	2.5	2.4	<0.5	2.3	270	9.2
	03/21/02		15.58	92.03	NS	NS	NS	NS	NS	NS
	04/17/02			16.25	91.36	2.5	0.72	<0.5	<0.5	360
MW-4	06/21/00	106.71	16.00	90.71	5.3	7.3	36	85	1,400	4
	09/20/00		16.03	90.68	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	12/22/00		NM	NC	NS	NS	NS	NS	NS	NS
	03/26/01		15.05	91.66	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	05/30/01		15.62	91.09	NS	NS	NS	NS	NS	NS
	09/23/01		16.07	90.64	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	12/28/01		13.68	93.03	NS	NS	NS	NS	NS	NS
	03/21/02		14.04	92.67	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	04/17/02			14.78	91.93	NS	NS	NS	NS	NS

TABLE 1

SUMMARY OF GROUNDWATER ELEVATION AND ANALYTICAL DATA

ARCO Service Station No. 6148
5131 Shattuck Avenue
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	TPH as Gasoline (µg/L)	MTBE (µg/L)
MW-5	06/21/00	106.60	16.52	90.08	<0.5	<0.5	<0.5	<1.0	67	10
	09/20/00		16.34	90.26	<0.5	<0.5	<0.5	<0.5	<50	3.48
	12/22/00		15.58	91.02	11.5	2.53	4.02	6.25	341	146
	03/26/00		15.45	91.15	12.4	<5.0	<5.0	<5.0	767	163
	05/30/01		15.77	90.83	2.3	<0.5	<0.5	0.81	110	72
	09/23/01		16.16	90.44	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	12/28/01		14.09	92.51	2.8	1.9	<0.5	2.6	240	48
	03/21/02		14.43	92.17	<0.5	<0.5	<0.5	<0.5	NS	NS
	04/17/02		14.96	91.64	<0.5	<0.5	<0.5	<0.5	<50	<2.5
MW-6	06/21/00	105.13	13.91	91.22	NS	NS	NS	NS	NS	NS
	09/20/00		14.03	91.10	NS	NS	NS	NS	NS	NS
	12/22/00		NM	NC	NS	NS	NS	NS	NS	NS
	03/26/01		12.59	92.54	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	05/30/01		13.40	91.73	NS	NS	NS	NS	NS	NS
	09/23/01		13.49	91.64	NS	NS	NS	NS	NS	NS
	12/28/01		12.07	93.06	NS	NS	NS	NS	NS	NS
	03/21/02		11.79	93.34	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	04/17/02		12.45	92.68	NS	NS	NS	NS	NS	NS

TABLE 1

SUMMARY OF GROUNDWATER ELEVATION AND ANALYTICAL DATA

ARCO Service Station No. 6148
5131 Shattuck Avenue
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	Benzene (mg/L)	Toluene (mg/L)	Ethyl-benzene (mg/L)	Total Xylenes (mg/L)	TPH as Gasoline (mg/L)	MTBE (mg/L)
MW-7	06/21/00	107.05	14.57	92.48	NS	NS	NS	NS	NS	NS
	09/20/00		14.58	92.47	NS	NS	NS	NS	NS	NS
	12/22/00		13.21	93.84	NS	NS	NS	NS	NS	NS
	03/26/01		13.18	93.87	<0.5	<0.5	<0.5	<0.5	71.4	<2.5
	05/30/01		13.80	93.25	NS	NS	NS	NS	NS	NS
	09/23/01		14.27	92.78	NS	NS	NS	NS	NS	NS
	12/28/01		12.24	94.81	NS	NS	NS	NS	NS	NS
	03/21/02		12.16	94.89	<0.5	<0.5	<0.5	<0.5	<50	<2.5
	04/17/02		13.08	93.97	NS	NS	NS	NS	NS	NS

TPH = Total Petroleum Hydrocarbons

MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted

mg/L = Micrograms per liter

NM = Not measured

NC = Not calculated

NS = Not Sampled

Note: Please refer to Attachment C for Historical Groundwater Elevation and Analytical Data Tables developed by IT Corporation

Note: All data presented in this table was provided to URS Corporation by Delta Environmental Consultants Inc. URS has not verified the accuracy of this data.

TABLE 2

GROUNDWATER FLOW DIRECTION AND GRADIENT

ARCO Service Station No. 6148
 5131 Shattuck Avenue
 Oakland, California

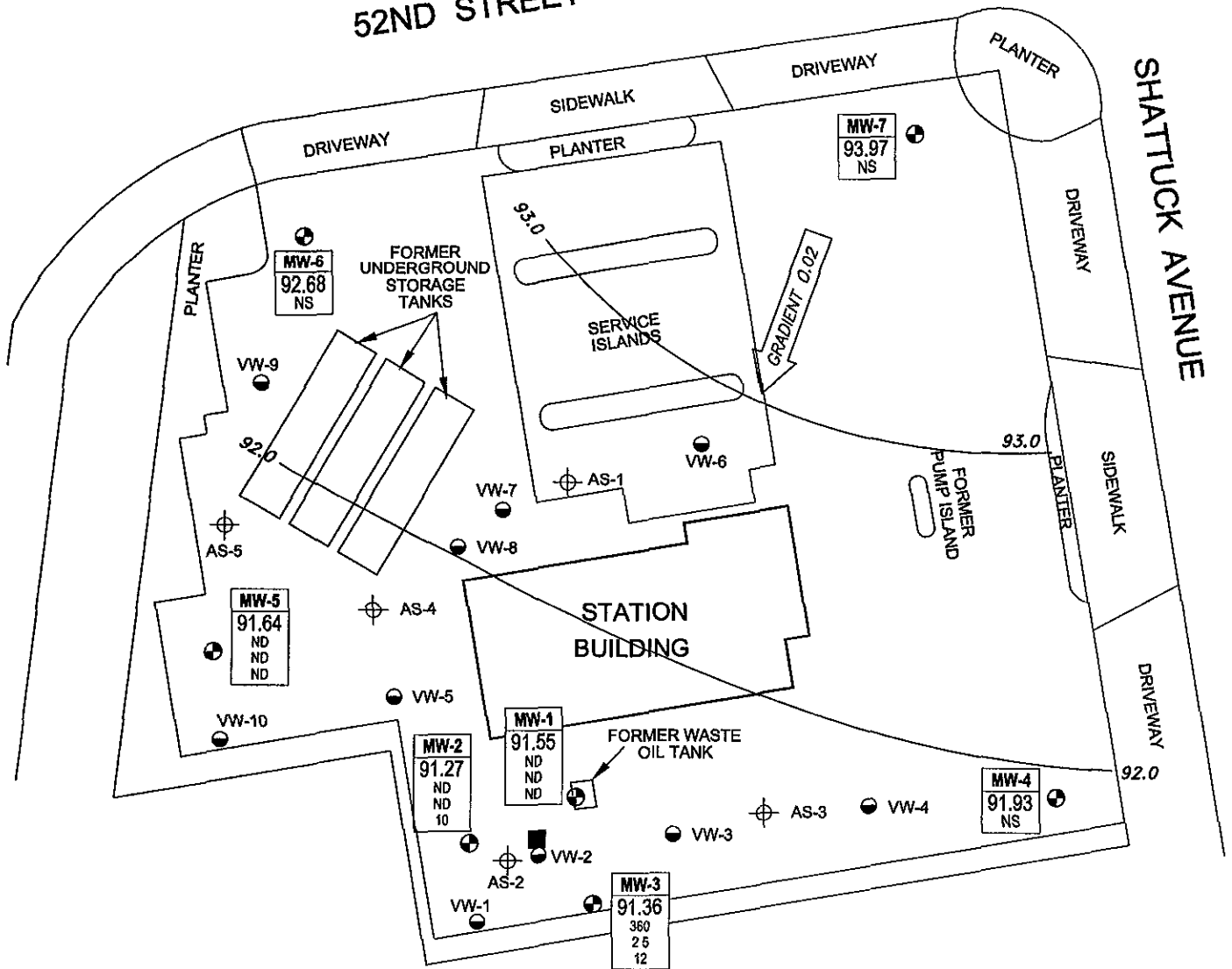
Date Measured	Average Flow Direction	Average Hydraulic Gradient
06/21/00	South-Southwest	0.02
09/20/00	South-Southwest	0.017
12/22/00	South-Southwest	0.022
03/26/01	South-Southwest	0.020
05/30/01	South-Southwest	0.020
09/23/01	South-Southwest	0.019
12/28/01	Southwest	0.019
03/21/02	Southwest	0.019
04/17/02	Southwest	0.02*

Note: All data presented in this table was provided to URS Corporation by Delta Environmental Consultants Inc. URS has not verified the accuracy of this data.

Note: Please refer to Attachment C for Historical Groundwater Elevation and Analytical Data Tables developed by IT Corporation

52ND STREET

SHATTUCK AVENUE

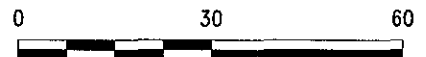


LEGEND:

- MW-1 MONITORING WELL LOCATION
 - ⊕ AS-2 AIR SPARGING WELL
 - VW-1 SOIL VAPOR EXTRACTION WELL LOCATION
 - DESTROYED WELL LOCATION
- | | |
|------------------|--|
| MW-3 | WELL DESIGNATION |
| 91.36 | GROUNDWATER ELEVATION (FT/MSL) |
| 360
2.5
12 | CONCENTRATION OF TOTAL PETROLEUM HYDROCARBONS AS GASOLINE, BENZENE, AND MTBE IN GROUNDWATER IN MICROGRAMS PER LITER (µg/L). SAMPLES COLLECTED ON 01/09/02. |
- ND NOT DETECTED
 - NS NOT SAMPLED
 - 92.0 GROUNDWATER ELEVATION CONTOUR (FT/MSL)
 - ← APPROXIMATE GROUNDWATER FLOW DIRECTION AND GRADIENT



NORTH



SCALE IN FEET

NOTE: SITE MAP ADAPTED FROM IT CORPORATION FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

X:\x_env\waste\BP_GEM\Sites\Scott_Robinson\Paul_Supple\6148\Reports\Monitoring\Qtr_2_2002\Drawings\1_GWEC_4-17-02.dwg



Project No. 38465989
Arco Service Station 6148
5131 Shattuck Avenue
Oakland, California

GROUNDWATER ELEVATION CONTOUR
AND ANALYTICAL SUMMARY MAP
Second Quarter 2002 (April 17, 2002)

FIGURE

1

ATTACHMENT A
FIELD PROCEDURES

FIELD PROCEDURES

Sampling Procedures

The sampling procedure for each well consists first of measuring the water level and depth to bottom, and checking for the presence of free phase petroleum product (free product), using either an electronic indicator and a clear Teflon™ bailer or an oil-water interface probe. Wells not containing free product are purged approximately three casing volumes of water (or until dewatered) using a centrifugal pump, gas displacement pump, or bailer. Equipment and purging method used for the current sampling event is noted on the attached field data sheets. During purging, temperature, pH, and electrical conductivity are monitored to document that these parameters are stable prior to collecting samples. After purging, water levels are allowed to partially (approximately 80%) recover. Groundwater samples (both purge and no purge) are collected using a Teflon bailer, placed into appropriate Environmental Protection Agency- (EPA) approved containers, labeled, logged onto chain-of-custody records, and transported on ice to a California State-certified laboratory. Wells with free product are not sampled and free product is removed according to California Code of Regulation, Title 23, Div. 3, Chap. 16, Section 2655, UST Regulations.

ATTACHMENT B

**LABORATORY PROCEDURES,
CERTIFIED ANALYTICAL REPORTS,
AND CHAIN-OF-CUSTODY RECORDS**

LABORATORY PROCEDURES

Laboratory Procedures

The groundwater samples were analyzed for the presence of the chemicals noted on the chain-of-custody using standard EPA Methods. The methods of analysis for the groundwater samples are documented in the certified analytical report. The certified analytical reports and chain-of-custody record are presented in this attachment. The analytical data provided by the laboratory approved by Group Environmental Management Company have been reviewed and verified by that laboratory.



29 April, 2002

Steven Meeks
Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova, CA 95670

RE: ARCO 6148, Oakland, CA
Sequoia Report: S204353

Enclosed are the results of analyses for samples received by the laboratory on 04/19/02 15:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Lito Diaz
Laboratory Director

CA ELAP Certificate #1624



Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova CA, 95670

Project: ARCO 6148, Oakland, CA
Project Number: 6148, Oakland, CA
Project Manager: Steven Meeks

Reported:
04/29/02 14:32

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	S204353-01	Water	04/17/02 10:20	04/19/02 15:20
MW-2	S204353-02	Water	04/17/02 10:32	04/19/02 15:20
MW-3	S204353-03	Water	04/17/02 10:26	04/19/02 15:20
MW-5	S204353-04	Water	04/17/02 10:30	04/19/02 15:20
TB	S204353-05	Water	04/17/02 05:00	04/19/02 15:20

Sequoia Analytical - Sacramento

Ron Chew, Client Services Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



Delta Environmental Consultants (Rancho Cordova)
 3164 Gold Camp Drive Ste. 200
 Rancho Cordova CA, 95670

Project: ARCO 6148, Oakland, CA
 Project Number: 6148, Oakland, CA
 Project Manager: Steven Meeks

Reported:
 04/29/02 14:32

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT
Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (S204353-01) Water Sampled: 04/17/02 10:20 Received: 04/19/02 15:20									
Purgeable Hydrocarbons	ND	50	ug/l	1	2040324	04/25/02	04/25/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		105 %	60-140		"	"	"	"	
MW-2 (S204353-02) Water Sampled: 04/17/02 10:32 Received: 04/19/02 15:20									
Purgeable Hydrocarbons	ND	50	ug/l	1	2040324	04/25/02	04/25/02	DHS LUFT	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	10	2.5	"	"	"	"	"	"	C-07
<i>Surrogate: a,a,a-Trifluorotoluene</i>		106 %	60-140		"	"	"	"	
MW-3 (S204353-03) Water Sampled: 04/17/02 10:26 Received: 04/19/02 15:20									
Purgeable Hydrocarbons	360	50	ug/l	1	2040324	04/25/02	04/25/02	DHS LUFT	HC-12
Benzene	2.5	0.50	"	"	"	"	"	"	
Toluene	0.72	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	12	2.5	"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		101 %	60-140		"	"	"	"	

Delta Environmental Consultants (Rancho Cordova)
 3164 Gold Camp Drive Ste. 200
 Rancho Cordova CA, 95670

 Project: ARCO 6148, Oakland, CA
 Project Number: 6148, Oakland, CA
 Project Manager: Steven Meeks

 Reported:
 04/29/02 14:32

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT
Sequoia Analytical - Sacramento

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
MW-5 (S204353-04) Water Sampled: 04/17/02 10:30 Received: 04/19/02 15:20										
Purgeable Hydrocarbons	ND	50		ug/l	1	2040324	04/25/02	04/25/02	DHS LUFT	
Benzene	ND	0.50		"	"	"	"	"	"	
Toluene	ND	0.50		"	"	"	"	"	"	
Ethylbenzene	ND	0.50		"	"	"	"	"	"	
Xylenes (total)	ND	0.50		"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5		"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		<i>110 %</i>		<i>60-140</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	
TB (S204353-05) Water Sampled: 04/17/02 05:00 Received: 04/19/02 15:20										
Purgeable Hydrocarbons	ND	50		ug/l	1	2040324	04/25/02	04/25/02	DHS LUFT	
Benzene	ND	0.50		"	"	"	"	"	"	
Toluene	1.5	0.50		"	"	"	"	"	"	C-07
Ethylbenzene	ND	0.50		"	"	"	"	"	"	
Xylenes (total)	ND	0.50		"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5		"	"	"	"	"	"	
<i>Surrogate: a,a,a-Trifluorotoluene</i>		<i>92.6 %</i>		<i>60-140</i>		<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	

Delta Environmental Consultants (Rancho Cordova 3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670	Project: ARCO 6148, Oakland, CA Project Number: 6148, Oakland, CA Project Manager: Steven Meeks	Reported: 04/29/02 14:32
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**Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT - Quality Control
Sequoia Analytical - Sacramento**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 2040324 - EPA 5030B (P/T)
Blank (2040324-BLK1)

Prepared & Analyzed: 04/25/02

Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
<i>Surrogate. a,a,a-Trifluorotoluene</i>	10.6		"	10.0		106	60-140			

LCS (2040324-BS1)

Prepared & Analyzed: 04/25/02

Benzene	9.81	0.50	ug/l	10.0		98.1	70-130			
Toluene	9.23	0.50	"	10.0		92.3	70-130			
Ethylbenzene	9.44	0.50	"	10.0		94.4	70-130			
Xylenes (total)	29.5	0.50	"	30.0		98.3	70-130			
Methyl tert-butyl ether	12.6	2.5	"	10.0		126	70-130			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	10.6		"	10.0		106	60-140			

Matrix Spike (2040324-MS1)

Source: S204339-02

Prepared & Analyzed: 04/25/02

Benzene	10.5	0.50	ug/l	10.0	ND	105	60-140			
Toluene	9.75	0.50	"	10.0	ND	97.5	60-140			
Ethylbenzene	10.1	0.50	"	10.0	ND	101	60-140			
Xylenes (total)	31.6	0.50	"	30.0	ND	105	60-140			
Methyl tert-butyl ether	10.7	2.5	"	10.0	ND	107	60-140			
<i>Surrogate. a,a,a-Trifluorotoluene</i>	10.1		"	10.0		101	60-140			

Matrix Spike Dup (2040324-MSD1)

Source: S204339-02

Prepared & Analyzed: 04/25/02

Benzene	11.1	0.50	ug/l	10.0	ND	111	60-140	5.56	25	
Toluene	10.2	0.50	"	10.0	ND	102	60-140	4.51	25	
Ethylbenzene	10.4	0.50	"	10.0	ND	104	60-140	2.93	25	
Xylenes (total)	33.0	0.50	"	30.0	ND	110	60-140	4.33	25	
Methyl tert-butyl ether	14.6	2.5	"	10.0	ND	146	60-140	30.8	25	QM-07
<i>Surrogate: a,a,a-Trifluorotoluene</i>	11.3		"	10.0		113	60-140			

Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova CA, 95670

Project: ARCO 6148, Oakland, CA
Project Number: 6148, Oakland, CA
Project Manager: Steven Meeks

Reported:
04/29/02 14:32

Notes and Definitions

- C-07 The reported compound(s) have been confirmed by a second (dissimilar) column or detector.
- HC-12 Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel.
- QM-07 The spike recovery was outside control limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

ARCO Products Company
Division of Atlantic Richfield Company

Task Order No.

Chain of Custody

ARCO Facility no. 6148 City (Facility) Oakland Ca Project manager (Consultant) STEVEN MEEKS
 ARCO engineer PAUL SUPPLE Telephone no. (ARCO) Telephone no. (Consultant) 638 2085 Fax no. (Consultant) 638 8385
 Consultant name Delta ENV Address (Consultant) Rancho Cordova

Laboratory name
Seuon
Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8120	BTEX/PH MTSE EPA 1462/820/8015	TPH Modified 8015 Gas Diesel	Oil and Grease 413.2 419.2	TPH EPA 418.1/818/805E	EPA 801/8010	EPA 808/8040	EPA 808/8070	TCAP Metals VOA VOA Special VOA	CWA Metals EPA 8010/8010 TLC STLC	Lead Cd Pb EPA 7420/7421	
			Soil	Water	Other	Ice	Acid														
MW-1		2		X		X	X	4-19-02	10:20		X										
MW-2									10:32												
MW-3									10:26												
MW-5									10:30												
TB									5:00												

Method of shipment

Special detection
Limit/reporting

Special QAVOC

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:
 Relinquished by sampler [Signature] Date 4-19-02 Time
 Relinquished by _____ Date _____ Time
 Relinquished by _____ Date _____ Time

Temperature received:
 Received by Monica Grogan Date 4/19/02 15:20
 Received by _____
 Received by laboratory Date _____ Time _____

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: Pete En
 REC. BY (PRINT) MOMER
 WORKORDER: S204353

DATE Received at Lab: 4/19/02
 TIME Received at Lab: 1530
 LOG IN DATE: 4/20/02

(Drinking water) for regulatory purposes: YES/NO NO
 (Wastewater) for regulatory purposes: YES/NO NO

CIRCLE THE APPROPRIATE RESPONSE		LAB SAMPLE #	#	CLIENT ID	DESCRIPTION	SAMPLE MATRIX	DATE SAMPLED	CONDITION (ETC.)
1. Custody Seal(s)	Present / <u>Absent</u> Intact / Broken*	<u>S204353</u>	<u>01</u>	<u>mw-1</u>	<u>UOI</u>	<u>W</u>	<u>4/17/02</u>	
2. Chain-of-Custody	<u>Present</u> / Absent*	<u>1</u>	<u>02</u>	<u>1-2</u>	<u>1</u>	<u>1</u>	<u>1</u>	
3. Traffic Reports or Packing List:	Present / <u>Absent</u>	<u>1</u>	<u>03</u>	<u>1-3</u>	<u>1</u>	<u>1</u>	<u>1</u>	
4. Airbill:	Airbill / <u>Sticker</u> Present / <u>Absent</u>	<u>1</u>	<u>04</u>	<u>1-5</u>	<u>1</u>	<u>1</u>	<u>1</u>	
5. Airbill #:			<u>05</u>	<u>7B</u>	<u>1</u>	<u>1</u>	<u>1</u>	
6. Sample Labels:	<u>Present</u> / Absent							
7. Sample IDs:	<u>Listed</u> / Not Listed on Chain-of-Custody							
8. Sample Condition:	<u>Intact</u> / Broken* / <u>Leaking</u> *							
9. Does information on custody reports, traffic reports and sample labels agree?	<u>Yes</u> / No*							
10. Sample received within hold time:	<u>Yes</u> / No*							
11. Proper Preservatives used:	<u>Yes</u> / No*							
12. Temp Rec. at Lab: (Acceptance range for samples requiring thermal pres.: 4+-2°C)	<u>Yes</u> / No*							

*If Circled, contact Project Manager and attach record of resolution.

ATTACHMENT C
HISTORIC GROUNDWATER DATA
AND SVE SYSTEM OPERATION DATA

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-1	03-20-95	108.03	15.75	ND	92.28	830	140	5	41	110	--	--		
MW-1	06-06-95	108.03	17.68	ND	90.35	210	30	<0.5	7.3	16	--	--		
MW-1	08-24-95	107.80	17.45	ND	90.35	Not sampled: well was inaccessible due to construction								
MW-1	11-16-95	107.80	17.64	ND	90.16	<50	5.6	<0.5	1.4	1.2	55	--		
MW-1	02-27-96	107.80	15.21	ND	92.59	1,400	240	88	44	110	200	--		
MW-1	05-15-96	107.80	17.53	ND	90.27	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-1	08-14-96	107.80	17.15	ND	90.65	98	18	<0.5	1.9	1	45	--		
MW-1	11-11-96	107.80	17.78	ND	90.02	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-1	03-25-97	107.80	17.68	ND	90.12	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-1	05-15-97	107.80	17.91	ND	89.89	Not sampled: well sampled semi-annually, during the first and third quarter								
MW-1	10-26-97	107.80	18.85	ND	88.95	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-1	11-10-97	107.80	18.10	ND	89.70	<50	<0.5	<0.5	<0.5	<0.5	4	--		
MW-1	02-13-98	107.80	13.15	ND	94.65	<100	8.4	<1	<1	14	130	--		
MW-1	05-12-98	107.80	12.30	ND	95.50	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-1	07-28-98	107.80	17.04	ND	90.76	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-1	10-28-98	107.80	18.10	ND	89.70	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-1	02-12-99	107.80	15.84	ND	91.96	72	<0.5	<0.5	<0.5	<0.5	23	--		
MW-1	06-03-99	107.80	17.62	ND	90.18	890	33	1.5	12	2.8	250	--	1.44	NP
MW-1	10-26-99	107.80	16.92	ND	90.88	<50	<0.5	<0.5	<0.5	<1	9	--	9.58	NP
MW-1	02-02-00	107.80	15.70	ND	92.10	<50	<0.5	<0.5	<0.5	<1	<3	--	8.9	NP
MW-2	03-20-95	107.43	15.50	ND#	91.93	Not sampled: floating product entered well during purging								
MW-2	06-06-95	107.43	17.43	ND	90.00	1,200	60	21	35	140	--	--		
MW-2	08-24-95	107.28	17.22	ND	90.06	Not sampled: well was inaccessible due to construction								
MW-2	11-16-95	107.28	17.36	ND	89.92	360	45	1.3	7.1	7.5	210	--		
MW-2	02-27-96	107.28	14.82	ND	92.46	8,900	1,400	980	150	550	940	--		
MW-2	05-15-96	107.28	17.40	ND	89.88	480	82	48	8	48	87	--		

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MW-2	08-14-96	107.28	17.00	ND	90.28	130	22	4	2	9	120	--		
MW-2	11-11-96	107.28	17.55	ND	89.73	1,200	150	120	21	160	110	--		
MW-2	03-25-97	107.28	17.32	ND	89.96	670	23	58	13	120	28	--		
MW-2	05-15-97	107.28	17.61	ND	89.67	<50	<0.5	<0.5	<0.5	<0.5	23	--		
MW-2	10-26-97	107.28	18.43	ND	88.85	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-2	11-10-97	107.28	17.84	ND	89.44	<100	<1	<1	<1	1	74	--		
MW-2	02-13-98	107.28	12.75	ND	94.53	220	9.5	3.9	3.7	48	84	--		
MW-2	05-12-98	107.28	17.02	ND	90.26	3,900	210	280	86	910	35	--		
MW-2	07-28-98	107.28	17.30	ND	89.98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-2	10-28-98	107.28	17.80	ND	89.48	170	17	<0.5	1.7	5.0	24	--		
MW-2	02-12-99	107.28	15.55	ND	91.73	12,000	620	95	490	2,200	270	--		
MW-2	06-03-99	107.28	17.31	ND	89.97	<50	<0.5	<0.5	<0.5	1.1	8	--	2.53	NP
MW-2	10-26-99	107.28	16.58	ND	90.70	<50	1.0	<0.5	<0.5	3	<3	--	8.17	NP
MW-2	02-02-00	107.28	15.30	ND	91.98	<50	<0.5	<0.5	<0.5	<1	<3	--	9.1	NP
MW-3	03-20-95	107.77	15.60	ND	92.17	29,000	880	190	760	2,000	--	16		
MW-3	06-06-95	107.77	17.54	ND	90.23	22,000	450	54	380	1,300	--	7.1		
MW-3	08-24-95	107.61	17.42	ND	90.19	Not sampled: well was inaccessible due to construction								
MW-3	11-16-95	107.61	17.58	ND	90.03	13,000	210	<20	320	1,000	790	8.3		
MW-3	02-27-96	107.61	15.03	ND	92.58	9,700	94	15	290	720	430	10		
MW-3	05-15-96	107.61	17.35	ND	90.26	5,600	66	12	37	67	230	--		
MW-3	08-14-96	107.61	17.10	ND	90.51	830	17	<1*	8	7	110	--		
MW-3	11-11-96	107.61	17.73	ND	89.88	500	28	3	12	13	150	--		
MW-3	03-25-97	107.61	17.99	ND	89.62	<50	<0.5	<0.5	<0.5	<0.5	94	--		
MW-3	05-15-97	107.61	17.84	ND	89.77	<50	<0.5	<0.5	<0.5	<0.5	65	--		
MW-3	10-26-97	107.61	18.50	ND	89.11	220	4	<1	<1	<1	160	--		
MW-3	11-10-97	107.61	18.00	ND	89.61	350	8	<2	3	3	230	--		

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MW-3	02-13-98	107.61	13.00	ND	94.61	<50	1.3	<0.5	<0.5	1	21	--				
MW-3	05-12-98	107.61	17.20	ND	90.41	120	<0.5	<0.5	<0.5	<0.9	71	--				
MW-3	07-28-98	107.61	17.46	ND	90.15	<50	1.4	<0.5	<0.5	<0.5	52	--				
MW-3	10-28-98	107.61	18.00	ND	89.61	170	<0.5	<0.5	<0.5	0.7	35	--				
MW-3	02-12-99	107.61	15.76	ND	91.85	120	2.0	0.6	<0.5	1.3	37	--				
MW-3	06-03-99	107.61	Well inaccessible: Surveyed well VW-1 as an alternative													
MW-3	10-26-99	107.61	16.69	ND	90.92	630	14	0.7	13	2	38	--	1.24	NP		
MW-3	02-02-00	107.61	15.65	ND	91.96	290	18	0.5	45	56	46	--	0.4	NP		
MW-4	03-20-95	106.58	13.85	ND	92.73	88	1	<0.5	<0.5	0.7	--	--				
MW-4	06-06-95	106.58	15.70	ND	90.88	<50	<0.5	<0.5	<0.5	<0.5	--	--				
MW-4	08-24-95	106.71	15.86	ND	90.85	Not sampled: well was inaccessible due to construction										
MW-4	11-16-95	106.71	16.10	ND	90.61	<50	<0.5	<0.5	<0.5	<0.5	6	--				
MW-4	02-27-96	106.71	13.72	ND	92.99	<50	<0.5	<0.5	<0.5	<0.5	10	--				
MW-4	05-15-96	106.71	15.90	ND	90.81	Not sampled: well sampled semi-annually, during the first and third quarter										
MW-4	08-14-96	106.71	15.68	ND	91.03	<50	<0.5	<0.5	<0.5	<0.5	<3	--				
MW-4	11-11-96	106.71	16.19	ND	90.52	Not sampled: well sampled semi-annually, during the first and third quarter										
MW-4	03-25-97	106.71	16.10	ND	90.61	<50	<0.5	<0.5	<0.5	<0.5	<3	--				
MW-4	05-15-97	106.71	16.38	ND	90.33	Not sampled: well sampled semi-annually, during the first and third quarter										
MW-4	10-26-97	106.71	17.78	ND	88.93	<50	<0.5	<0.5	<0.5	<0.5	<3	--				
MW-4	11-10-97	106.71	16.43	ND	90.28	Not sampled: well sampled semi-annually, during the first and third quarter										
MW-4	02-13-98	106.71	13.05	ND	93.66	<50	1.3	0.7	<0.5	2.3	19	--				
MW-4	05-12-98	106.71	15.69	ND	91.02	Not sampled: well sampled semi-annually, during the first and third quarter										
MW-4	07-28-98	106.71	15.93	ND	90.78	<50	<0.5	<0.5	<0.5	<0.5	<3	--				
MW-4	10-28-98	106.71	16.40	ND	90.31	Not sampled: well sampled semi-annually, during the first and third quarter										
MW-4	02-12-99	106.71	14.13	ND	92.58	<50	<0.5	<0.5	<0.5	<0.5	<3	--				
MW-4	06-03-99	106.71	16.00	ND	90.71	Not sampled: well sampled semi-annually, during the first and third quarter										

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Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-4	10-26-99	106.71	15.76	ND	90.95	Not sampled: well sampled semi-annually, during the first and third qtr.							1.72	
MW-4	02-02-00	106.71	14.32	ND	92.39	<50	<0.5	<0.5	<0.5	<1	<3	--	0.7	NP
MW-5	03-20-95	106.68	14.92	ND	91.76	21,000	6,900	450	800	1,300	--	--		
MW-5	06-06-95	106.68	16.61	ND	90.07	6,500	1,700	<20	120	69	--	--		
MW-5	08-24-95	106.60	16.47	ND	90.13	Not sampled: well was inaccessible due to construction								
MW-5	11-16-95	106.60	16.69	ND	89.91	1,800	470	<5	17	5	1,000	--		
MW-5	02-27-96	106.60	14.35	ND	92.25	10,000	1,000	71	690	1,000	440/450*	--		
MW-5	05-15-96	106.60	16.58	ND	90.02	3,400	350	6	72	20	220	--		
MW-5	08-14-96	106.60	17.26	ND	89.34	2,100	130	2.7	47	4.7	220	--		
MW-5	11-11-96	106.60	16.62	ND	89.98	1,200	31	1	8	2	130	--		
MW-5	03-25-97	106.60	16.38	ND	90.22	<50	<0.5	<0.5	<0.5	<0.5	5	--		
MW-5	05-15-97	106.60	16.54	ND	90.06	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-5	10-26-97	106.60	17.60	ND	89.00	<50	<0.5	<0.5	<0.5	<0.5	7	--		
MW-5	11-10-97	106.60	16.78	ND	89.82	<50	<0.5	<0.5	<0.5	<0.5	24	--		
MW-5	02-13-98	106.60	12.21	ND	94.39	11,200	51	<10	<10	<10	2,000	--		
MW-5	05-12-98	106.60	NR	ND	NR	Not sampled: well inaccessible								
MW-5	07-28-98	106.60	16.47	ND	90.13	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-5	10-28-98	106.60	16.80	ND	89.80	<50	0.8	<0.5	<0.5	<0.5	99	--		
MW-5	02-12-99	106.60	14.88	ND	91.72	<1,000	<10	<10	<10	<10	1,100	--		
MW-5	06-03-99	106.60	16.65	ND	89.95	290	10	<0.5	<0.5	0.6	200	--	2.45	NP
MW-5	10-26-99	106.60	16.10	ND	90.50	<50	<0.5	<0.5	<0.5	<1	11	--	NM	NP
MW-5	02-02-00	106.60	14.65	ND	91.95	<50	<0.5	<0.5	<0.5	<1	39	--	8.6	NP
MW-6	03-20-95	105.16	12.13	ND	93.03	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	06-06-95	105.16	13.95	ND	91.21	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	08-24-95	105.13	14.07	ND	91.06	<50	<0.5	<0.5	<0.5	<0.5	<3	--		

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ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-6	11-16-95	105.13	14.34	ND	90.79	<60	<0.5	<0.5	<0.5	<0.5	--	--		
MW-6	02-27-96	105.13	12.00	ND	93.13	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	05-15-96	105.13	14.10	ND	91.03	Not sampled: well sampled annually, during the first quarter								
MW-6	08-14-96	105.13	13.70	ND	91.43	Not sampled: well sampled annually, during the first quarter								
MW-6	11-11-96	105.13	14.11	ND	91.02	Not sampled: well sampled annually, during the first quarter								
MW-6	03-25-97	105.13	14.15	ND	90.98	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-6	05-15-97	105.13	14.44	ND	90.69	Not sampled: well sampled annually, during the first quarter								
MW-6	10-26-97	105.13	16.02	ND	89.11	Not sampled: well sampled annually, during the first quarter								
MW-6	11-10-97	105.13	14.52	ND	90.61	Not sampled: well sampled annually, during the first quarter								
MW-6	02-13-98	105.13	10.06	ND	95.07	<50	<0.5	<0.5	<0.5	<0.5	8	--		
MW-6	05-12-98	105.13	13.75	ND	91.38	Not sampled: well sampled annually, during the first quarter								
MW-6	07-28-98	105.13	14.06	ND	91.07	Not sampled: well sampled annually, during the first quarter								
MW-6	10-28-98	105.13	14.71	ND	90.42	Not sampled: well sampled annually, during the first quarter								
MW-6	02-12-99	105.13	12.22	ND	92.91	<100	<1	<1	<1	<1	110	--		
MW-6	06-03-99	105.13	13.95	ND	91.18	Not sampled: well sampled annually, during the first quarter								
MW-6	10-26-99	105.13	14.06	ND	91.07	Not sampled: well sampled annually, during the first quarter								
MW-6	02-02-00	105.13	12.03	ND	93.10	<50	<0.5	<0.5	<0.5	<1	<3	--	3.94 1.2	NP
MW-7	03-20-95	107.08	12.32	ND	94.76	<50	<0.5	<0.5	<0.5	<0.5	--	--		
MW-7	06-06-95	107.08	14.59	ND	92.49	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-7	08-24-95	107.05	14.64	ND	92.41	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	11-16-95	107.05	15.30	ND	91.75	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-7	02-27-96	107.05	12.24	ND	94.81	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	05-15-96	107.05	14.65	ND	92.40	Not sampled: well sampled annually, during the first quarter								
MW-7	08-14-96	107.05	14.35	ND	92.70	Not sampled: well sampled annually, during the first quarter								
MW-7	11-11-96	107.05	14.92	ND	92.13	Not sampled: well sampled annually, during the first quarter								
MW-7	03-25-97	107.05	14.80	ND	92.25	<50	<0.5	<0.5	<0.5	<0.5	<3	--		

Table 1
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present**

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Well Number	Date Gauged/ Sampled	Top of Casing Elevation (ft-MSL)	Depth to Water (feet)	FP Thickness (feet)	Groundwater Elevation (ft-MSL)	TPH Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
MW-7	05-15-97	107.05	15.27	ND	91.78	Not sampled: well sampled annually, during the first quarter								
MW-7	10-26-97	107.05	16.68	ND	90.37	Not sampled: well sampled annually, during the first quarter								
MW-7	11-10-97	107.05	15.37	ND	91.68	Not sampled: well sampled annually, during the first quarter								
MW-7	02-13-98	107.05	10.80	ND	96.25	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	05-12-98	107.05	14.32	ND	92.73	Not sampled: well sampled annually, during the first quarter								
MW-7	07-28-98	107.05	14.79	ND	92.26	Not sampled: well sampled annually, during the first quarter								
MW-7	10-28-98	107.05	15.57	ND	91.48	Not sampled: well sampled annually, during the first quarter								
MW-7	02-12-99	107.05	12.46	ND	94.59	<50	<0.5	<0.5	<0.5	<0.5	<3	--		
MW-7	06-03-99	107.05	14.53	ND	92.52	Not sampled: well sampled annually, during the first quarter								
MW-7	10-26-99	107.05	14.74	ND	92.31	Not sampled: well sampled annually, during the first quarter								
MW-7	02-02-00	107.05	12.57	ND	94.48	<50	<0.5	<0.5	<0.5	<1	<3	--	1.97	NP
VW-1	06-03-99	NR	17.51	ND	NR	420	2.3	0.6	2.0	2.2	74	--	1.28	P

ft-MSL: elevation in feet, relative to mean sea level
 TPH: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
 BTEX: Benzene, toluene, ethylbenzene, total xylenes by EPA method 8021B. (EPA method 8020 prior to 10/26/99)
 MTBE: Methyl tert-butyl ether by EPA method 8021B. (EPA method 8020 prior to 10/26/99).
 TRPH: total recoverable petroleum hydrocarbons
 µg/L: micrograms per liter
 mg/L: milligrams per liter
 NR: not reported; data not available
 ND: none detected
 #: floating product entered the well during purging
 -: not analyzed or not applicable
 *: confirmed by EPA 8240
 **: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report, ARCO Service Station 6148, Oakland, California*, (EMCON, March 4, 1996).

Table 2
Groundwater Flow Direction and Gradient

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date Measured	Average Flow Direction	Average Hydraulic Gradient
03-20-95	Southwest	0.02
06-06-95	Southwest	0.016
08-24-95	Southwest	0.014
11-16-95	Southwest	0.012
02-27-96	Southwest	0.016
05-15-96	Southwest	0.015
08-14-96	Southwest	0.021
11-11-96	Southwest	0.015
03-25-97	South-Southwest	0.018
05-15-97	South-Southwest	0.014
10-26-97	Southwest	0.009
11-10-97	South-Southwest	0.014
02-13-98	South-Southwest	0.012
05-12-98	Southwest	0.02
07-28-98	Southwest	0.02
10-28-98	Southwest	0.01
02-12-99	Southwest	0.02
06-03-99	Southwest	0.02
10-26-99	Southwest	0.01
02-02-00	South-Southwest	0.017

Table 3
Soil Vapor Extraction System
Operational Uptime Information (1998 - present)

Arco Service Station No. 6148
5131 Shattuck Avenue, Oakland, California

Date	Meter (hrs.)	Operation ¹ (hrs.)	Period Operation				Cumulative Operation			
			Total (days)	Uptime (days)	Downtime (days)	Uptime (%)	Total (days)	Uptime (days)	Downtime (days)	Uptime (%)
01/01/98		2697.50					827	112.4	714.6	14%
01/27/98	2702.01	2697.50	26	0.0	26.0	0%	853	112.4	740.6	13%
02/10/98	2704.73	2700.22	14	0.1	13.9	1%	867	112.5	754.5	13%
02/16/98	2704.73	2700.22	6	0.0	6.0	0%	873	112.5	760.5	13%
03/23/98	2704.73	2700.22	35	0.0	35.0	0%	908	112.5	795.5	12%
05/06/98	2704.73	2700.22	44	0.0	44.0	0%	952	112.5	839.5	12%
05/13/98	2704.73	2700.22	7	0.0	7.0	0%	959	112.5	846.5	12%
06/22/98	2704.73	2700.22	40	0.0	40.0	0%	999	112.5	886.5	11%
08/20/98	2704.73	2700.22	59	0.0	59.0	0%	1058	112.5	945.5	11%
08/27/98	2707.40	2702.89	7	0.1	6.9	2%	1065	112.6	952.4	11%
09/01/98	2709.55	2705.04	5	0.1	4.9	2%	1070	112.7	957.3	11%
09/02/98	2711.93	2707.42	1	0.1	0.9	10%	1071	112.8	958.2	11%
11/10/98	2712.40	2707.89	69	0.0	69.0	0%	1140	112.8	1027.2	10%
12/18/98	2714.81	2710.3	38	0.1	37.9	0%	1178	112.9	1065.1	10%
01/15/99	2714.18	2709.67	28	0.0	28.0	0%	1206	112.9	1093.1	9%
04/27/99	2717.29	2712.78	102	0.1	101.9	0%	1308	113.0	1195.0	9%
05/26/99	2717.29	2712.78	29	0.0	29.0	0%	1337	113.0	1224.0	8%
07/30/99	2718.05	2713.54	65	0.0	65.0	0%	1402	113.1	1288.9	8%
08/11/99	2718.05	2713.54	12	0.0	12.0	0%	1414	113.1	1300.9	8%
08/25/99	2718.05	2713.54	14	0.0	14.0	0%	1428	113.1	1314.9	8%
09/09/99	2718.45	2713.94	15	0.0	15.0	0%	1443	113.1	1329.9	8%
09/21/99	2720.63	2716.12	12	0.1	11.9	1%	1455	113.2	1341.8	8%
10/06/99	2723.11	2718.6	15	0.1	14.9	1%	1470	113.3	1356.7	8%
10/20/99	2725.62	2721.11	14	0.1	13.9	1%	1484	113.4	1370.6	8%

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(6148o100.xls)

Recreated from electronic data provided by IT Corporation.

IT CORPORATION

**Table 3
Soil Vapor Extraction System
Operational Uptime Information (1998 - present)**

**Arco Service Station No. 6148
5131 Shattuck Avenue, Oakland, California**

Date	Meter (hrs.)	Operation ¹ (hrs.)	Period Operation				Cumulative Operation			
			Total (days)	Uptime (days)	Downtime (days)	Uptime (%)	Total (days)	Uptime (days)	Downtime (days)	Uptime (%)
11/03/99	2728.21	2723.7	14	0.1	13.9	1%	1498	113.5	1384.5	8%
11/18/99	2730.66	2726.15	15	0.1	14.9	1%	1513	113.6	1399.4	8%
12/02/99	2732.80	2728.29	14	0.1	13.9	1%	1527	113.7	1413.3	7%
12/16/99	2735.22	2730.71	14	0.1	13.9	1%	1541	113.8	1427.2	7%
01/06/00	2735.22	2730.71	21	0.0	21.0	0%	1562	113.8	1448.2	7%
01/19/00	2737.83	2733.32	13	0.1	12.9	1%	1575	113.9	1461.1	7%
02/02/00	2740.27	2735.76	14	0.1	13.9	1%	1589	114.0	1475.0	7%
03/23/00	2740.77	2736.26	50	0.0	50.0	0%	1639	114.0	1525.0	7%

¹ Operational data through 01/01/98 from First Quarter 1998 Quarterly Monitoring Report

Table 4
Soil Vapor Extraction System
Flow Rates and Analytical Results of Air Samples (1998 - present)

Arco Service Station No. 6148
5131 Shattuck Avenue, Oakland, California

Date	Sample Location	Vacuum (in. H2O)	Velocity (fpm)	Flowrate ¹ (scfm)	Analyses (ppmv)					
					TPHG	Benzene	Toulene	Ethylbenzene	Xylene	MTBE
01/27/98	Influent	21	1100	51	39	<0.1	0.7	0.1	<0.2	
	Effluent ²		1100	83.1	<5	<0.1	<0.1	<0.1	<0.2	
08/20/98	Influent	10	1100	53	610	<2	<2	<2	<4	
	Effluent		1100	83.1	7	<0.1	<0.1	<0.1	<0.2	
11/10/98	Influent	Not Recorded			830	<2	14	<2	<4	
	Effluent	Not Recorded			20	<0.1	0.2	<0.1	<0.2	
01/15/99	Influent	21.8	1500	70	340	3	5	<2	<4	44
	Effluent		900	63.9	15	<0.1	0.3	<0.1	0.2	<0.8
09/09/99	Influent	10	1400	67	140	0.3	1	0.2	0.5	6.3
	Effluent		975	69.2	<5	<0.1	<0.1	<0.1	<0.2	<0.8
10/06/99	Influent	8	1400	67	220	<0.5	1.4	0.65	3	11
	Effluent		975	69.2	7.1	<0.1	<0.1	<0.1	<0.2	<0.8
11/03/99	Influent	8	1200	58	44	0.3	3.1	0.1	0.6	21
	Effluent		1050	74.5	<5	<0.1	<0.1	<0.1	<0.2	<0.8
12/02/99	Influent	10	1000	48	24	<0.1	0.1	<0.1	<0.2	<0.8
	Effluent		900	64.4	<5	<0.1	<0.1	<0.1	<0.2	<0.8
01/06/00	Influent	6.2	1000	48	270	0.3	0.8	0.6	0.6	6
	Effluent		925	66.1	22.0	<0.1	<0.1	<0.1	<0.2	1.6

Table 4
Soil Vapor Extraction System
Flow Rates and Analytical Results of Air Samples (1998 - present)

Arco Service Station No. 6148
5131 Shattuck Avenue, Oakland, California

Date	Sample Location	Vacuum (in. H2O)	Velocity (fpm)	Flowrate ¹ (scfm)	Analyses (ppmv)					
					TPHG	Benzene	Toulene	Ethylbenzene	Xylene	MTBE
02/02/00	Influent	12	850	40	<5	<0.1	0.5	<0.1	0.2	
	Effluent		900	64.4	<5	<0.1	0.3	<0.1	<0.2	

¹ Influent Flow Rate, cfm = (Velocity, fpm)(Influent Pipe Area, sq. ft.)(406.8 in.H2O - Vacuum, in.H2O) / (406.8 in.H2O)
where Influent Pipe Diameter = 3"
Effluent Flow Rate, cfm = (Velocity, fpm)(Effluent Pipe Area, sq.ft.){(460° R + 77° F)/(460° R + Vapor Temp F)}
where Effluent (after blower) Pipe Diameter = 4"
² Dilution air only

Table 5
Soil Vapor Extraction System
Extraction Rates, Emission Rates, Destruction Efficiency, and Mass Removed
(1998 - present)

Arco Service Station No. 6148
5131 Shattuck Avenue, Oakland, California

Date End	Extraction Rate from Wellfield ¹		Emission Rate to Atmosphere ²		Destruction Efficiency ³		Period Removal ⁴		Cumulative Removal	
	TPHG (lbs/day)	Benzene (lbs/day)	TPHG (lbs/day)	Benzene (lbs/day)	TPHG (%)	Benzene (%)	TPHG (lbs)	Benzene (lbs)	TPHG (lbs)	Benzene (lbs)
01/01/98 ⁵									1885.6	0
01/28/98	0.7335	0	<0.1527	<0.0024	Waived		0.0831	0.0000	1885.7	0.0000
08/20/98	11.7994	0	<0.2137	<0.0024	Waived		4.956	0.0000	1890.6	0.0000
11/10/98	Not Calculated		Not Calculated		Not Calculated		Not Calculated		Not Calculated	
01/15/99	8.702	0.0768	0.3520	<0.0018	Waived		1.175	0.0104	1891.8	0.0104
09/09/99	3.447	0.0074	<0.1271	<0.0020	Waived		0.3705	0.0008	1892.2	0.0112
10/06/99	5.443	0	0.1805	<0.0020	Waived		1.132	0.0000	1893.3	0.0112
11/03/99	0.933	0.0064	<0.1369	<0.0021	Waived		0.1960	0.0013	1893.5	0.0125
12/02/99	0.422	0	<0.1182	<0.0018	Waived		0.0802	0.0000	1893.6	0.0125
01/06/00	4.793 ⁶	0.0053	<0.5347	<0.0019	Waived		0.5213	0.0006	1894.1	0.0131
02/02/00	0	0	<0.1182	<0.0018	Waived		0.0000	0.0000	1894.1	0.0131

¹ Extraction Rate, lbs/day = (Influent Flow, cfm)(Influent conc., ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10⁶)(24.45 moles/L)(453.6 g/lb)

where TPHG = 100 g/mole and Benzene = 78.1 g/mole; Influent conc. = 0, if reported as non-detect

² Emission Rate, lbs/day = (Effluent Flow, cfm)(Effluent conc., ppmv)(g/mole)(60 min/hr)(24 hr/day)(28.3 L/cf) / (10⁶)(24.45 moles/L)(453.6 g/lb)

where TPHG = 100 g/mole and Benzene = 78.1 g/mole; Effluent conc. = Method Reporting Limit, if reported as non-detect

³ Destruction Efficiency, % = (Extraction Rate - Emission Rate)(100) / (Extraction Rate); "Waived" = if TPHG emissions <1.0 lbs/day and Benzene emissions <0.02 lbs/day

⁴ Period Removal, lbs = (Extraction Rate)(Uptime)

⁵ Operational data through 1/1/98 from First Quarter 1998 Quarterly Monitoring Report

⁶ Value represents 24 hour per day operation. Refer to Period Removal column for actual quantity

ATTACHMENT D

EDCC REPORT AND EDF/GEOWELL SUBMITTAL CONFIRMATION

Error Summary Log

10/29/02

EDF 1.2i All files present in deliverable.

Laboratory:	Sequoia Analytical Laboratories, Inc., Sacramento, CA
Project Name:	ARCO 6148, Oakland, CA
Work Order Number:	S204353
Global ID:	T0600100103
Lab Report Number:	S204353102820021510

Report Summary

Labreport	Sampid	Labsampid	Mtrx	QC	Anmcode	Exmcode	Logdate	Extdate	Anadate	Labiocfl	Run	Sub
S20435310282002	MW-1 1510	S20435301	W	CS	SW8021B	SW5030B	04/17/02	04/25/02	04/25/02	2040324	1	
S20435310282002	MW-2 1510	S20435302	W	CS	SW8021B	SW5030B	04/17/02	04/25/02	04/25/02	2040324	1	
S20435310282002	MW-3 1510	S20435303	W	CS	SW8021B	SW5030B	04/17/02	04/25/02	04/25/02	2040324	1	
S20435310282002	MW-5 1510	S20435304	W	CS	SW8021B	SW5030B	04/17/02	04/25/02	04/25/02	2040324	1	
S20435310282002	TB 1510	S20435305	W	CS	SW8021B	SW5030B	04/17/02	04/25/02	04/25/02	2040324	1	
		S20433902	W	NC	SW8021B	SW5030B	//	04/25/02	04/25/02	2040324	1	
		2040324BS1	WQ	BS1	SW8021B	SW5030B	//	04/25/02	04/25/02	2040324	1	
		2040324BLK1	WQ	LB1	SW8021B	SW5030B	//	04/25/02	04/25/02	2040324	1	
		2040324MS1	W	MS1	SW8021B	SW5030B	//	04/25/02	04/25/02	2040324	1	
		2040324MSD1	W	SD1	SW8021B	SW5030B	//	04/25/02	04/25/02	2040324	1	

EDFSAMP: Error Summary Log

10/29/02

Error type	Logcode	Projname	Npdiwo	Sampid	Matrix
There are no errors in this data file					

EDFTEST: Error Summary Log

10/29/02

Error type	Labsampid	Qccode	Anmcode	Exmcode	Anadate	Run number
There are no errors in this data file					//	0

EDFRES: Error Summary Log

10/29/02

Error type	Labsampid	Qccode	Matrix	Anmcode	Pvccode	Anadate	Run number	Parlabel
Warning: extra parameter	2040324MS1	MS1	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	2040324MS1	MS1	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	2040324MS1	MS1	W	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	2040324MSD1	SD1	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	2040324MSD1	SD1	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	2040324MSD1	SD1	W	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	S20433902	NC	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	S20433902	NC	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	S20433902	NC	W	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	S20435301	CS	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	S20435301	CS	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	S20435301	CS	W	SW8021B	PR	04/25/02	1	PHCG
Warning: extra parameter	S20435301	CS	W	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	S20435302	CS	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	S20435302	CS	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	S20435302	CS	W	SW8021B	PR	04/25/02	1	PHCG
Warning: extra parameter	S20435302	CS	W	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	S20435303	CS	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	S20435303	CS	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	S20435303	CS	W	SW8021B	PR	04/25/02	1	PHCG
Warning: extra parameter	S20435303	CS	W	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	S20435304	CS	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	S20435304	CS	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	S20435304	CS	W	SW8021B	PR	04/25/02	1	PHCG
Warning: extra parameter	S20435304	CS	W	SW8021B	PR	04/25/02	1	XYLENES

Error type	Labsampid	Qcocode	Matrix	Anmcode	Pvccode	Anadate	Run number	Parlabel
Warning: extra parameter	S20435305	CS	W	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	S20435305	CS	W	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	S20435305	CS	W	SW8021B	PR	04/25/02	1	PHCG
Warning: extra parameter	S20435305	CS	W	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	2040324BLK1	LB1	WQ	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	2040324BLK1	LB1	WQ	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	2040324BLK1	LB1	WQ	SW8021B	PR	04/25/02	1	PHCG
Warning: extra parameter	2040324BLK1	LB1	WQ	SW8021B	PR	04/25/02	1	XYLENES
Warning: extra parameter	2040324BS1	BS1	WQ	SW8021B	PR	04/25/02	1	AAATFBZME
Warning: extra parameter	2040324BS1	BS1	WQ	SW8021B	PR	04/25/02	1	MTBE
Warning: extra parameter	2040324BS1	BS1	WQ	SW8021B	PR	04/25/02	1	XYLENES

EDFQC: Error Summary Log

10/29/02

Error type	Labioccti	Anmcode	Parlabel	Qccode	Labqcid
There are no errors in this data files					

EDFCL: Error Summary Log

10/29/02

Error type	Clevdate	Anmcode	Exmcode	Parlabel	Cicode
There are no errors in this data file	//				

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Submittal Title: EDCC Report for Site #6148

Submittal Type: GW Monitoring Report

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