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Alameda County

JAN 26 2004

Environmental Health

January 21, 2004

Mr. Don Hwang  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**Re: Fourth Quarter 2003 Groundwater Monitoring Report  
ARCO Service Station #6148  
5131 Shattuck Avenue  
Oakland, California  
URS Project #38486335**

Dear Mr. Hwang:

On behalf of Atlantic Richfield Company (ARCO – a BP affiliated company), URS Corporation (URS) is submitting the *Fourth Quarter 2003 Groundwater Monitoring Report* for the ARCO Service Station #6148, located at 5131 Shattuck Avenue, Oakland, California.

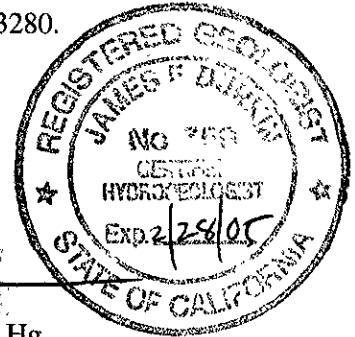
If you have any questions regarding this submission, please call (510) 874-3280.

Sincerely,

**URS CORPORATION**

Scott Robinson  
Project Manager

James F. Durkin, C.Hg.  
Senior Geologist



Enclosure: Fourth Quarter 2003 Groundwater Monitoring Report

cc: Mr. Paul Supple, ARCO, (electronic copy uploaded to ENFOS)



Atlantic Richfield Company  
(a BP affiliated company)

P.O. Box 6549  
Moraga, California 94570  
Phone: (925) 299-8891  
Fax: (925) 299-8872

January 21, 2004

RE: Fourth Quarter 2003 Groundwater Monitoring Report  
ARCO Service Station #6148  
5131 Shattuck Avenue  
Oakland, CA  
URS Project #38486335

I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct.

Submitted by:

Paul Supple  
Environmental Business Manager

RO 77



Alameda County

JAN 26 2004

Environmental Health

**REPORT**

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Alameda County

JAN 23 2004

Environmental Health

**FOURTH QUARTER 2003  
GROUNDWATER MONITORING**

ARCO SERVICE STATION #6148  
5131 SHATTUCK AVENUE  
OAKLAND, CALIFORNIA

*Prepared for*  
Atlantic Richfield Company

January 21, 2004

**URS**

URS Corporation  
500 12<sup>th</sup> Street, Suite 200  
Oakland, California 94607

38486335

Date: January 21, 2004  
Quarter: 4Q 03

### 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  
Consultant Project No.: 38486335  
Primary Agency: Alameda County Health Care Services Agency (ACHCSA)

#### WORK PERFORMED THIS QUARTER (Fourth – 2003):

1. Performed fourth quarter 2003 groundwater monitoring event on December 17, 2003.
2. Prepared and submitted fourth quarter 2003 groundwater monitoring report.
3. Replaced oxygen releasing compounds (ORC) socks in wells MW-2 and MW-5 on November 18, 2003
4. Submitted workplan for confirmation soil sampling for closure on November 18, 2003.

#### WORK PROPOSED FOR NEXT QUARTER (First – 2004):

1. Perform first quarter 2004 groundwater monitoring event.
2. Prepare and submit first quarter 2004 groundwater monitoring report.

Current Phase of Project: GW monitoring/sampling  
Frequency of Groundwater Sampling: Quarterly : MW-1, MW-2, MW-3, & MW-5  
Semi-Annually (1<sup>st</sup>/3<sup>rd</sup> Quarter): Well MW-4  
Annually (3<sup>rd</sup> Quarter): MW-6 & MW-7  
Frequency of Groundwater Monitoring: Quarterly  
Is Free Product (FP) Present On-Site: No  
Current Remediation Techniques: Soil Vapor Extraction (SVE), Air-Sparge and Air-Bubbling Systems  
(all non-operational), ORC: (MW-2 and MW-5)  
Bulk Soil Removed to Date: 560 cubic yards  
Approximate Depth to Groundwater: 14.10 (MW-7) to 17.03 (MW-1) feet  
Groundwater Gradient (direction): Southwest  
Groundwater Gradient (magnitude): 0.017 feet per foot

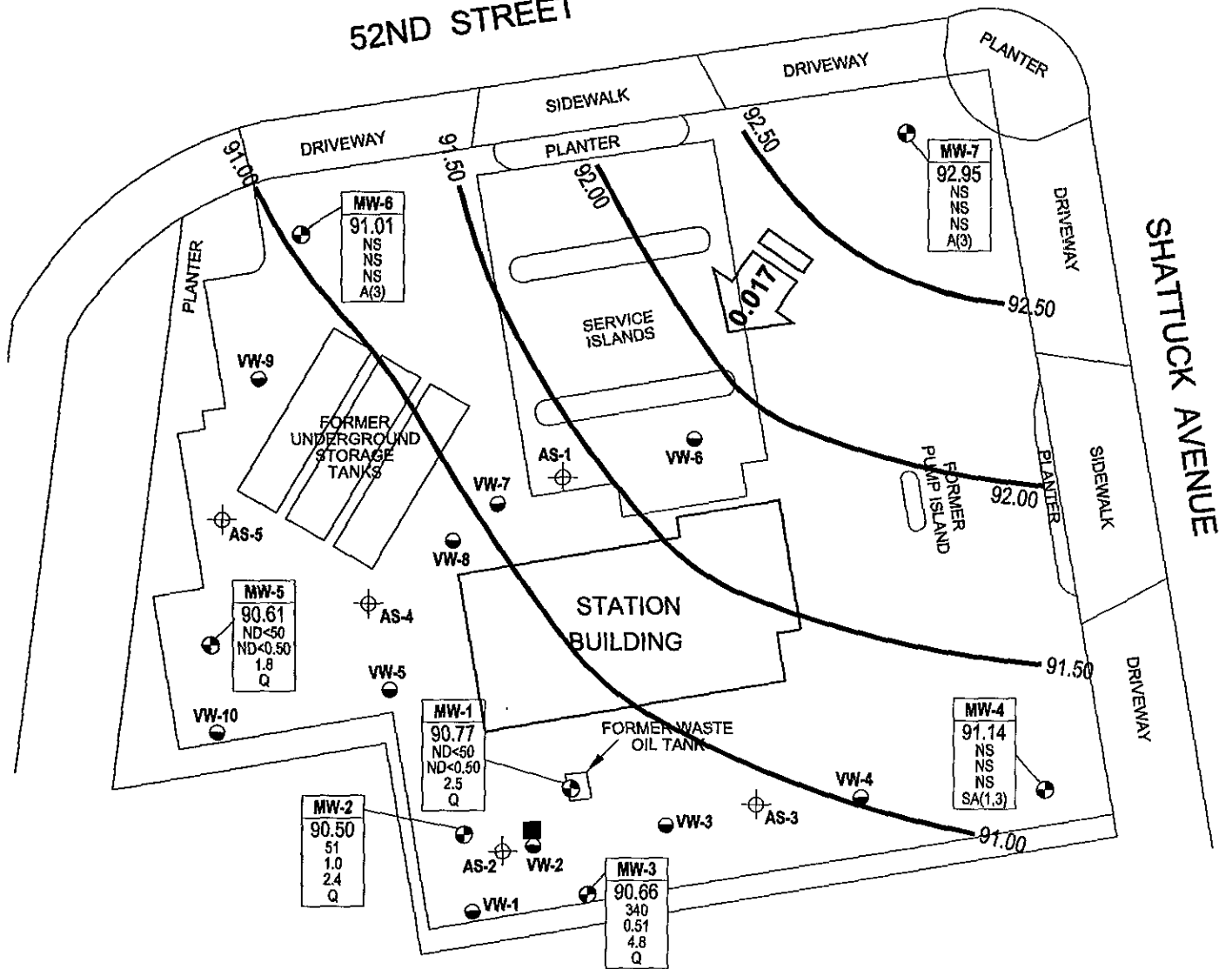
#### DISCUSSION:

TPH-g was detected above the laboratory reporting limit in two of the four wells sampled this quarter at concentrations of 51 µg/L (MW-2) and 340 µg/L (MW-3). Benzene was detected above the laboratory reporting limit in two wells sampled this quarter at concentrations of 1.0 µg/L (MW-2) and 0.51 µg/L (MW-3). MTBE was detected above the laboratory reporting limit in all four wells sampled this quarter at concentrations ranging from 1.8 µg/L (MW-5) to 4.8 µg/L (MW-3). No other fuel oxygenates were detected during this sampling event.

**ATTACHMENTS:**

- Figure 1 – Groundwater Elevation Contour and Analytical Summary Map – December 17, 2003
- Table 1 – Groundwater Elevation and Analytical Data
- Table 2 – Groundwater Flow Direction and Gradient
- Table 3 – Fuel Oxygenate Analytical Data
- Attachment A – Field Procedures and Field Data Sheets
- Attachment B – Laboratory Procedures, Certified Analytical Reports, and Chain-of-Custody Records
- Attachment C – Historic Groundwater Data
- Attachment D – EDCC and EDF/Geowell Submittal Confirmation

52ND STREET



**LEGEND:**

- MONITORING WELL
  - AIR SPARGING WELL
  - SOIL VAPOR EXTRACTION WELL
  - DESTROYED WELL
- | Well    | WELL DESIGNATION   |
|---------|--|
| ELEV    | GROUNDWATER ELEVATION (FT ABOVE MSL)                           |
| TPH-g   | CONCENTRATION OF TPH-g, BENZENE AND MTBE IN GROUNDWATER (µg/L) |
| Benzene |  |
| MTBE    |  |
| Q       | SAMPLING FREQUENCY   |
- A(3) SAMPLED ANNUALLY, 3RD QUARTER
  - ND< NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
  - Q SAMPLED QUARTERLY
  - SA(1,3) SAMPLED SEMI-ANNUALLY, 1ST & 3RD QUARTERS
  - GROUNDWATER FLOW DIRECTION AND GRADIENT (FT/FT)
  - 91.00 — GROUNDWATER ELEVATION CONTOUR (FT ABOVE MSL)



NORTH

0 30 60



SCALE IN FEET

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

X:\x\_env\waste\BP\_GEMIS\as\Scott\_Robinson\Paul\_Supples\148\Monitoring\QTR\_4\_2003\GWEC-AS\_12-17.dwg, 01/14/2004 02:44:41 PM, JKMT, URS



**Project No. 38486335**  
**Arco Service Station 6148**  
**5131 Shattuck Avenue**  
**Oakland, California**

**GROUNDWATER ELEVATION CONTOUR**  
**AND ANALYTICAL SUMMARY MAP**  
**Fourth Quarter 2003 (December 17, 2003)**

FIGURE  
**1**

**Table 1**  
**Groundwater Elevation and Analytical Data**

ARCO Service Station # 6148  
5131 Shattuck Avenue  
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Top of Screen (ft bgs)	Depth to Well Bottom (ft bgs)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen <sup>5</sup> (mg/L)	pH <sup>5</sup>
MW-1	06/21/00	107.80	11.50	25.7	17.49	90.31	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<3.0	NA	NA
	09/20/00				17.64	90.16	ND<50	ND<0.5	0.677	ND<0.5	0.969	ND<2.5	NA	NA
	12/22/00				16.87	90.93	186	5.38	0.522	9.52	30.2	8.91	NA	NA
	03/26/01				16.60	91.20	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.1	NA	NA
	05/30/01				17.10	90.70	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA
	09/23/01				17.53	90.27	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	6.7	NA	NA
	12/28/01				15.57	92.23	ND<50	2.7	ND<0.5	ND<0.5	ND<0.5	20	NA	NA
	03/21/02				15.57	92.23	NS	NS	NS	NS	NS	NS	NA	NA
	04/17/02				16.25	91.55	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA
	08/19/02				17.69	90.11	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	2.0	7.1
	11/27/02				17.45	90.35	ND<50	ND<0.50	1.8	0.65	3.5	1.7	1.0	6.3
	02/05/03 <sup>4</sup>				16.93	90.87	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.1	1.2	7.3
	05/13/03	NP			16.95	90.85	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.0	6.5
	07/31/03	NP			17.74	90.06	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	0.55	1.2	6.0
	12/17/03	NP			17.03	90.77	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.5	2.0	6.5

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Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Top of Screen (ft bgs)	Depth to Well Bottom (ft bgs)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen <sup>5</sup> (mg/L)	pH <sup>5</sup>
MW-2	06/21/00	107.28	12.0	25.8	17.19	90.09	69	ND<0.5	ND<0.5	ND<0.5	ND<1.0	12	NA	NA
	09/20/00				17.31	89.97	ND<50	0.964	ND<0.5	ND<0.5	ND< 05	5.05	NA	NA
	12/22/00				16.58	90.70	2,140	174	60.2	118	438	123	NA	NA
	03/26/01				16.45	90.83	8,490	333	148	495	1,660	ND<250	NA	NA
	05/30/01				16.83	90.45	4,700	200	71	260	780	43	NA	NA
	09/23/01				17.30	89.98	160	5.9	1.8	0.80	41	14	NA	NA
	12/28/01				15.38	91.90	1,800	54	ND<5.0	ND<5.0	240	30	NA	NA
	03/21/02				15.36	91.92	NS	NS	NS	NS	NS	NS	NA	NA
	04/17/02				16.01	91.27	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	10	NA	NA
	08/19/02				17.53	89.75	170 <sup>1</sup>	22	0.92	14	26	ND<2.5	3.0	6.9
	11/27/02				17.21	90.07	340	22	0.68	13	26	ND<0.50	1.6	6.6
	02/05/03 <sup>4</sup>				16.72	90.56	83	2.7	ND<0.50	0.97	15	4.3	0.7	7.0
	05/13/03 <sup>6</sup>	NP			16.72	90.56	ND<50	0.91	ND<0.50	ND<0.50	0.60	2.8	0.7	6.5
	07/31/03	NP			17.51	89.77	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.0	7.1	6.7
	12/17/03	NP			16.78	90.50	51	1.0	ND<0.50	ND<0.50	ND<0.50	2.4	8.1	7.1



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5131 Shattuck Avenue  
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Top of Screen (ft bgs)	Depth to Well Bottom (ft bgs)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen <sup>5</sup> (mg/L)	pH <sup>5</sup>
MW-3	06/21/00	107.61	10.0	25.9	17.52	90.09	200	ND<0.5	ND<0.5	ND<0.5	2.1	24	NA	NA
	09/20/00				17.61	90.00	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	20	NA	NA
	12/22/00				16.85	90.76	227	4.73	1.06	2.58	5.22	27.3	NA	NA
	03/26/01				16.79	90.82	287	6.29	1.58	6.47	12.1	24.2	NA	NA
	05/30/01				17.11	90.50	500	10	ND<0.5	7.00	16	20	NA	NA
	09/23/01				17.57	90.04	400	6.4	0.74	ND<0.5	0.62	22	NA	NA
	12/28/01				15.41	92.20	270	2.5	2.4	ND<0.5	2.3	9.2	NA	NA
	03/21/02				15.58	92.03	NS	NS	NS	NS	NS	NS	NA	NA
	04/17/02				16.25	91.36	360	2.5	0.72	ND<0.5	ND<0.5	12	NA	NA
	08/19/02				17.66	89.95	750 <sup>2</sup>	11	2.1	ND<0.5	2.4	14	1.4	6.8
	11/27/02				17.69	89.92	470	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.1	6.6
	02/05/03 <sup>4</sup>				16.82	90.79	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.4	1.3	6.6
	05/13/03	NP			17.12	90.49	300	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.2	1.4	6.7
	07/31/03	NP			17.72	89.89	320	ND<0.50	ND<0.50	ND<0.50	ND<0.50	2.1	1.4	6.8
	07/31/03	NP			16.95	90.66	340	0.51	ND<0.50	ND<0.50	ND<0.50	4.8	1.3	6.7

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Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Top of Screen (ft bgs)	Depth to Well Bottom (ft bgs)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen <sup>5</sup> (mg/L)	pH <sup>5</sup>
MW-4	06/21/00	106.71	13.0	26.0	16.00	90.71	1,400	5.3	7.3	36	85	4	NA	NA
	09/20/00				16.03	90.68	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA
	12/22/00				NM	NC	NS	NS	NS	NS	NS	NS	NS	NS
	03/26/01				15.05	91.66	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA
	05/30/01				15.62	91.09	NS	NS	NS	NS	NS	NS	NS	NS
	09/23/01				16.07	90.64	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA
	12/28/01				13.68	93.03	NS	NS	NS	NS	NS	NS	NS	NS
	03/21/02				14.04	92.67	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA
	04/17/02				14.78	91.93	NS	NS	NS	NS	NS	NS	NS	NS
	08/19/02				16.18	90.53	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	1.4	6.8
	11/27/02				15.89	90.82	NS	NS	NS	NS	NS	NS	NS	NS
	02/05/03 <sup>4</sup>				15.40	91.31	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.1	6.6
	05/13/03				15.42	91.29	NS	NS	NS	NS	NS	NS	NS	NS
	07/31/03	P			16.23	90.48	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.4	6.4
	12/17/03				15.57	91.14	NS	NS	NS	NS	NS	NS	NS	NS

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Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Top of Screen (ft bgs)	Depth to Well Bottom (ft bgs)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen <sup>5</sup> (mg/L)	pH <sup>5</sup>	
MW-5	06/21/00	106.60	12.0	25.0	16.52	90.08	67	ND<0.5	ND<0.5	ND<0.5	ND<1.0	10	NA	NA	
	09/20/00				16.34	90.26	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.48	NA	NA	
	12/22/00				15.58	91.02	341	11.5	2.53	4.02	6.25	146	NA	NA	
	03/26/00				15.45	91.15	767	12.4	ND<5.0	ND<5.0	ND<5.0	163	NA	NA	
	05/30/01				15.77	90.83	110	2.3	ND<0.5	ND<0.5	0.81	72	NA	NA	
	09/23/01				16.16	90.44	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA	
	12/28/01				14.09	92.51	240	2.8	1.9	ND<0.5	2.6	48	NA	NA	
	03/21/02				14.43	92.17	NS	ND<0.5	ND<0.5	ND<0.5	ND<0.5	NS	NS	NS	
	04/17/02				14.96	91.64	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA	
	08/19/02				16.34	90.26	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>
	11/27/02				NM <sup>3</sup>	NM <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS	NS	
	02/05/03 <sup>4</sup>				NM <sup>3</sup>	NM <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>	NS <sup>3</sup>
	05/13/03 <sup>6</sup>	NP			15.43	91.17	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	15	1.4	6.2	
	07/31/03	NP			16.47	90.13	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.2	14.1	8.1	
12/17/03	NP			15.99	90.61	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.8	15.4	8.5		

**Table 1**  
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ARCO Service Station # 6148  
5131 Shattuck Avenue  
Oakland, California

Well Number	Date Sampled	Top of Riser Elevation (ft)	Depth to Top of Screen (ft bgs)	Depth to Well Bottom (ft bgs)	Depth to Groundwater (ft)	Groundwater Elevation (ft)	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	Dissolved Oxygen <sup>5</sup> (mg/L)	pH <sup>5</sup>		
MW-6	06/21/00	105.13	14.0	26.6	13.91	91.22	NS	NS	NS	NS	NS	NS	NS	NS		
	09/20/00				14.03	91.10	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	12/22/00				NM	NC	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/26/01				12.59	92.54	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA	
	05/30/01				13.40	91.73	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	09/23/01				13.49	91.64	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	12/28/01				12.07	93.06	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	03/21/02				11.79	93.34	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA	
	04/17/02				12.45	92.68	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	08/19/02				13.96	91.17	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	2.8	6.9	
	11/27/02				14.07	91.06	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	02/05/03 <sup>4</sup>				13.55	91.58	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	05/13/03				13.57	91.56	NS	NS	NS	NS	NS	NS	NS	NS	NS	
	07/31/03				P	14.18	90.95	67	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.8	6.5
	12/17/03				14.12	91.01	NS	NS	NS	NS	NS	NS	NS			

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MW-7	06/21/00	107.05	14.0	27.0	14.57	92.48	NS	NS	NS	NS	NS	NS	NS	NS	
	09/20/00				14.58	92.47	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/22/00				13.21	93.84	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/26/01				13.18	93.87	71.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA	
	05/30/01				13.80	93.25	NS	NS	NS	NS	NS	NS	NS	NS	NS
	09/23/01				14.27	92.78	NS	NS	NS	NS	NS	NS	NS	NS	NS
	12/28/01				12.24	94.81	NS	NS	NS	NS	NS	NS	NS	NS	NS
	03/21/02				12.16	94.89	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	NA	NA	
	04/17/02				13.08	93.97	NS	NS	NS	NS	NS	NS	NS	NS	NS
	08/19/02				14.73	92.32	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<2.5	1.4	6.7	
	11/27/02				14.76	92.29	NS	NS	NS	NS	NS	NS	NS	NS	NS
	02/05/03 <sup>4</sup>				14.07	92.98	NS	NS	NS	NS	NS	NS	NS	NS	NS
	05/13/03				14.00	93.05	NS	NS	NS	NS	NS	NS	NS	NS	NS
	07/31/03				P	14.88	92.17	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	1.6
	12/17/03		14.10	92.95	NS	NS	NS	NS	NS	NS	NS	NS	NS		

**Table 1**  
**Groundwater Elevation and Analytical Data**

ARCO Service Station # 6148  
5131 Shattuck Avenue  
Oakland, California

---

bgs = below ground surface

TPH = Total Petroleum Hydrocarbons

MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted (Prior to 2/5/03)

µg/L = Milligrams per liter

mg/L = Micrograms per liter

NA = Not available

NS = Not Sampled

ND< = Not detected above specified laboratory detection limit

P = Purge

NP = No Purge

1 = Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel.

2 = Chromatogram Pattern: Gasoline C6-C10

3 = Well MW-5 not sampled due to ORC sock wedged in well.

4 = TPH-g, BTEX, and MTBE analyzed by EPA method 8260B beginning on 1st Quarter Sampling Event (2/5/03)

5 = pH and dissolved oxygen are field measurements.

6 = During this monitoring event, the oxygen releasing compounds (ORC) were replaced for this well.

Source: The data within this table collected prior to August 2002 was provided to URS by the Atlantic Richfield Company and their previous consultants. URS has not verified the accuracy of this information.

**Table 2**  
**Groundwater Flow Direction and Gradient**

ARCO Service Station #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	0.017
08/19/02	Southwest	0.016
11/27/02	Southwest	0.015
02/05/03	Southwest	0.017
05/13/03	Southwest	0.013
07/31/03	Southwest	0.014
12/17/03	Southwest	0.017

Source: The data within this table collected prior to August 2002 was provided to URS by the Atlantic Richfield Company and their previous consultants. URS has not verified the accuracy of this information.

**Table 3**  
**Fuel Oxygenate Analytical Data**

ARCO Service Station #6148  
5131 Shattuck Avenue  
Oakland, California

Well Number	Date Sampled	Ethanol (µg/L)	TBA (µg/L)	MTBE (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
MW-1	02/05/03	ND<40	ND<20	1.1	ND<0.50	ND<0.50	ND<0.50	NA	NA
	05/13/03	ND<100	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA	NA
	07/31/03	ND<100	ND<20	0.55	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
	12/17/03	ND<100	ND<20	2.5	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
MW-2	02/05/03	ND<40	ND<20	4.3	ND<0.50	ND<0.50	ND<0.50	NA	NA
	05/13/03	ND<100	ND<20	2.8	ND<0.50	ND<0.50	ND<0.50	NA	NA
	07/31/03	ND<100	ND<20	2.0	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
	12/17/03	ND<100	ND<20	2.4	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
MW-3	02/05/03	ND<40	ND<20	2.4	ND<0.50	ND<0.50	ND<0.50	NA	NA
	05/13/03	ND<100	ND<20	2.2	ND<0.50	ND<0.50	ND<0.50	NA	NA
	07/31/03	ND<100	ND<20	2.1	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
	12/17/03	ND<100	ND<20	4.8	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
MW-4	02/05/03	ND<40	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	NA	NA
	05/13/03	NS	NS	NS	NS	NS	NS	NS	NS
	07/31/03	ND<100	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
	12/17/03	NS	NS	NS	NS	NS	NS	NS	NS
MW-5	02/05/03 <sup>1</sup>	NS	NS	NS	NS	NS	NS	NS	NS
	05/13/03	ND<100	ND<20	15	ND<0.50	ND<0.50	1.1	NA	NA
	07/31/03	ND<100	ND<20	1.2	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
	12/17/03	ND<100	ND<20	1.8	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
MW-6	02/05/03	NS	NS	NS	NS	NS	NS	NS	NS
	05/13/03	NS	NS	NS	NS	NS	NS	NS	NS
	07/31/03	ND<100	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
	12/17/03	NS	NS	NS	NS	NS	NS	NS	NS
MW-7	02/05/03	NS	NS	NS	NS	NS	NS	NS	NS
	05/13/03	NS	NS	NS	NS	NS	NS	NS	NS
	07/31/03	ND<100	ND<20	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50
	12/17/03	NS	NS	NS	NS	NS	NS	NS	NS

Note = All fuel oxygenate compounds analyzed using EPA Method 8260B  
TBA = tert-Butyl alcohol  
MTBE = Methyl tert-butyl ether  
DIPE = Di-isopropyl ether  
ETBE = Ethyl tert butyl ether  
TAME = tert-Amyl methyl ether  
1,2-DCA = 1,2-Dichloroethane  
EDB = 1,2-Dibromoethane  
µg/L = micrograms per liter  
ND< = Not detected at or above the laboratory detection limit  
NA = Data not available, not analyzed, or not applicable  
NS = Not Sampled  
1 = Well MW-5 not sampled due to ORC sock wedged in well.



**ATTACHMENT A**  
**FIELD PROCEDURES AND FIELD DATA SHEETS**

## **FIELD PROCEDURES**

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### **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.

# WELL GAUGING DATA

Project # 031217-PC1

Date 12/17/03

Client ~~SDI~~ URS 6148

Site 5131 Shattuck Ave., Oakland

Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or <del>TOB</del>	
MW-1	4					17.03	25.50	TOC	NP @ 11.5'
MW-2	4					16.78	25.55	 ↓	NP @ 12'
MW-3	4					16.95	25.60		NP @ 10'
MW-4	4					15.57	26.05		
MW-5	4					15.99	24.80		NP @ 12'
MW-6	4					14.12	26.60		
MW-7	4					14.10	26.95		

## ARCO / BP WELL MONITORING DATA SHEET

BTS #: 031217-PC1	Station # 6148
Sampler: PC	Date: 12/17/03
Well I.D.: MW-1	Well Diameter: 2 3 ④ 6 8
Total Well Depth: 25.50	Depth to Water: 17.03
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <del>RTE</del> Grade	D.O. Meter (if req'd): <del>YST</del> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Purge Method: <input checked="" type="checkbox"/> Bailer	Sampling Method: <input checked="" type="checkbox"/> Bailer
<input type="checkbox"/> Disposable Bailer	<input checked="" type="checkbox"/> Disposable Bailer
<input type="checkbox"/> Positive Air Displacement	<input type="checkbox"/> Extraction Port
<input type="checkbox"/> Electric Submersible Extraction Pump	Other: _____
Other: _____	

Top of Screen: NP @ 11.5' If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

1 Case Volume (Gals.)	X	_____	=	_____ Gals.
		Specified Volumes		Calculated Volume

Time	Temp (°F)	pH	Conductivity (mS or µS)	Gals. Removed	Observations
1000	66.6	6.5	436.7	-	clear
			NO PURGE		

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: -
Sampling Time: 1000	Sampling Date: 12/17/03
Sample I.D.: MW-1	Laboratory: Pace <del>Sequent</del> Other _____
Analyzed for: <del>TPH-G BTEX</del> MTBE TPH-D Other: <u>Oxys Ethanol by 8260</u>	
D.O. (if req'd):	Pre-purge: _____ mg/L
O.R.P. (if req'd):	Pre-purge: _____ mV
	Post-purge: <u>2.0</u> mg/L
	Post-purge: _____ mV

# ARCO / BP WELL MONITORING DATA SHEET

BTS #: <u>031217-PC1</u>	Station # <u>6148</u>
Sampler: <u>PC</u>	Date: <u>12/17/03</u>
Well I.D.: <u>MW-2</u>	Well Diameter: 2 3 <u>4</u> 6 8 <u>    </u>
Total Well Depth: <u>25.55</u>	Depth to Water: <u>16.78</u>
Depth to Free Product: <u>    </u>	Thickness of Free Product (feet): <u>    </u>
Referenced to: <u>RCE</u> Grade	D.O. Meter (if req'd): <u>VST</u> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Purge Method:	Sampling Method:
<input checked="" type="checkbox"/> Bailer	<input checked="" type="checkbox"/> Bailer
<input checked="" type="checkbox"/> Disposable Bailer	<input checked="" type="checkbox"/> Disposable Bailer
<input checked="" type="checkbox"/> Positive Air Displacement	<input type="checkbox"/> Extraction Port
<input checked="" type="checkbox"/> Electric Submersible Extraction Pump	Other: <u>    </u>
Other: <u>    </u>	

Top of Screen: NP @ 12' If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

1 Case Volume (Gals.)	X	Specified Volumes	=	Gals.
				Calculated Volume

Time	Temp (°F)	pH	Conductivity (mS or <del>µS</del> )	Gals. Removed	Observations
950	66.0	7.1	535.0	-	clear
			<b>NO PURGE</b>		

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: <u>    </u>
Sampling Time: <u>950</u>	Sampling Date: <u>12/17/03</u>
Sample I.D.: <u>MW-2</u>	Laboratory: Pace <del>Sequentia</del> Other <u>    </u>

Analyzed for: <del>TPH-G BTEX</del> MTBE TPH-D Other: <u>Oxy's &amp; Ethanol by 8260</u>	
D.O. (if req'd): Pre-purge: <u>    </u> mg/L	Post-purge: <u>0.1</u> mg/L
O.R.P. (if req'd): Pre-purge: <u>    </u> mV	Post-purge: <u>    </u> mV

## ARCO / BP WELL MONITORING DATA SHEET

BTS #: 031217-PC1	Station # 6148
Sampler: PC	Date: 12/17/03
Well I.D.: MW-3	Well Diameter: 2 3 ④ 6 8
Total Well Depth: 25.60	Depth to Water: 16.95
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <del>RTG</del> Grade	D.O. Meter (if req'd): <del>VSI</del> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Purge Method: <del>Bailer</del>	Sampling Method: Bailer
Disposable Bailer	<input checked="" type="checkbox"/> Disposable Bailer
Positive Air Displacement	Extraction Port
Electric Submersible Extraction Pump	Other: _____
Other: _____	

Top of Screen: NP @ 10'      If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

1 Case Volume (Gals.)	X	Specified Volumes	=	Calculated Volume
-----------------------	---	-------------------	---	-------------------

Time	Temp (°F)	pH	Conductivity (mS or <del>µS</del> )	Gals. Removed	Observations
1010	67.3	6.7	630.5	-	clear
			NO PURGE		

Did well dewater? Yes      No <u>  </u>	Gallons actually evacuated: _____
Sampling Time: 1010	Sampling Date: 12/17/03
Sample I.D.: MW-3	Laboratory: Pace <del>Septon</del> Other _____
Analyzed for: <del>PHG BTEX</del> MTBE TPH-D Other: <u>Oxy's &amp; Ethanol by 8260</u>	
D.O. (if req'd):	Pre-purge: _____ mg/L <del>ROSE-PURGE:</del> 1.3 mg/L
O.R.P. (if req'd):	Pre-purge: _____ mV      Post-purge: _____ mV

## ARCO / BP WELL MONITORING DATA SHEET

BTS #: 031217-PC1	Station # 6148
Sampler: PC	Date: 12/17/03
Well I.D.: MW-5	Well Diameter: 2 3 ④ 6 8
Total Well Depth: 24.80	Depth to Water: 15.99
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <del>PVE</del> Grade	D.O. Meter (if req'd): <del>VST</del> HACH

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Purge Method: ~~Bailer~~ Disposable Bailer Positive Air Displacement Electric Submersible Extraction Pump Other: \_\_\_\_\_

Sampling Method: Bailer  Disposable Bailer Extraction Port Other: \_\_\_\_\_

Top of Screen: 11@12' If well is listed as a no-purge, confirm that water level is below the top of screen. Otherwise, the well must be purged.

1 Case Volume (Gals.)	X	Specified Volumes	=	Calculated Volume	Gals.
-----------------------	---	-------------------	---	-------------------	-------

Time	Temp (°F)	pH	Conductivity (mS or <del>µS</del> )	Gals. Removed	Observations
920	62.5	8.5	696.8	-	clear
			NO PURGE		

Did well dewater? Yes  No  Gallons actually evacuated: -

Sampling Time: 920 Sampling Date: 12/17/03

Sample I.D.: MW-5 Laboratory: Pace ~~Sequent~~ Other: \_\_\_\_\_

Analyzed for: ~~TPH-G BTEX~~ MTBE TPH-D Other: on-site ethanol by 8260

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	15.4 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV



# Chain of Custody Record

Project Name Q148 GWM  
 BP BU/GEM CO Portfolio Retail  
 BP Laboratory Contract Number: Atlantic Richfield Company  
 Requested Due Date (mm/dd/yy) 14 day TAT

Date: 12/17/03

On-site Time: <u>7:10</u>	Temp: <u>60°F</u>
Off-site Time: <u>11:55</u>	Temp: <u>70°F</u>
Sky Conditions: <u>Clear</u>	
Meteorological Events: <u>none</u>	
Wind Speed: <u>South</u>	Direction: <u>SE</u>

BP/GEM Facility No.: <u>ARCO 6148</u>	Consultant/Contractor: <u>URS</u>
BP/GEM Facility Address: <u>5131 Shattuck Ave, OAKLAND, CA</u>	Address: <u>500 12th St., Ste. 200</u>
Site ID No. <u>ARCO 6148</u>	<u>Oakland, CA 94609-4014</u>
Site Lat/Long:	e-mail EDD: <u>donna.casper@URSCorp.com</u>
California Global ID #: <u>T0600100103</u>	Consultant/Contractor Project No.: <u>J5-00006148.01 00427</u>
BP/GEM PM Contact: <u>PAUL SUPPLE</u>	Consultant Tele/Fax: <u>510-893-3600/510-874-3268</u>
Address: <u>P.O. Box 6549</u>	Consultant/Contractor PM: <u>Scott Robinson</u>
<u>Moraga, CA 94570</u>	Invoice to: Consultant/Contractor of <u>BP/GEM</u> (Circle one)
Tele/Fax: <u>925-299-8891/925-299-8872</u>	BP/GEM Work Release No: <u>INTRIM -50769</u>

Item No.	Sample Description	Time	Matrix				Laboratory No.	No. of containers	Preservatives				Requested Analysis							Sample Point Lat/Long and Comments
			Soil/Solid	Water/Liquid	Sediments	Air			Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	TPH-G / BTEX (8015/8021) (8260)	TPH-D (8015)	MTBE (8021)	MTBE (8260)	MTBE, TAME, ETBE (8260)	DIPE, TBA (8260)	1,2-DCA & EDB (8260)	
1	MW-1	1000		X			3						X			X	X	X		
2	MW-2	950		X			3						X			X	X	X		
3	MW-3	1010		X			3						X			X	X	X		
4	MW-5	920		X			3						X			X	X	X		
5																				
6																				
7																				
8																				
9																				
10																				

Sampler's Name:	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
<u>P. Cornish</u>	<u>[Signature]</u>					
Sampler's Company: <u>Blaine Tech</u>						
Shipment Date:						
Shipment Method:						
Shipment Tracking No:						

Special Instructions: Address Invoice to BP/GEM but send to URS for approval

Custody Seals In Place Yes X No ✗ Temperature Blank Yes No Cooler Temperature on Receipt F/C Trip Blank Yes No



**BP GEM OIL COMPANY TYPE **A** BILL OF LADING**

SOURCE RECORD **BILL OF LADING** FOR NON-HAZARDOUS PURGEWATER RECOVERED FROM GROUNDWATER WELLS AT BP GEM OIL COMPANY FACILITIES IN THE STATE OF CALIFORNIA. THE NON-HAZARDOUS PURGE- WATER WHICH HAS BEEN RECOVERED FROM GROUND- WATER WELLS IS COLLECTED BY THE CONTRACTOR, MADE UP INTO LOADS OF APPROPRIATE SIZE AND HAULED BY DILLARD ENVIRONMENTAL TO THE ALTAMONT LANDFILL AND RESOURCE RECOVERY FACILITY IN LIVERMORE, CALIFORNIA.

The contractor performing this work is PLAINE TECH SERVICES, INC. (BTS), 1680 Rogers Avenue, San Jose, CA 95112 (phone [408] 573-0555). Blaine Tech Services, Inc. is authorized by BP GEM OIL COMPANY to recover, collect, apportion into loads the Non-Hazardous Well Purgewater that is drawn from wells at the BP GEM Oil Company facility indicated below and deliver that purgewater to BTS. Transport routing of the Non-Hazardous Well Purgewater may be direct from one BP GEM facility to the designated destination point; from one BP GEM facility to the designated destination point via another BP GEM facility; from a BP GEM facility to the designated destination point via the contractor's facility, or any combination thereof. The Non-Hazardous Well Purgewater is and remains the property of BP GEM Oil Company.

This **Source Record BILL OF LADING** was initiated to cover the recovery of Non-Hazardous Well Purgewater from wells at the BP GEM Oil Company facility described below:

6148

Station #

5131 Shattuck Ave.

Station Address

Total Gallons Collected From Groundwater Monitoring Wells:

71

added equip.

rinse water 4

any other

adjustments \_\_\_\_\_

**TOTAL GALS.**

**RECOVERED** 75

loaded onto

BTS vehicle # 22

BTS event #

031217-PC1

time

date

12/17/02

signature

[Signature]

\*\*\*\*\*

REC'D AT

time

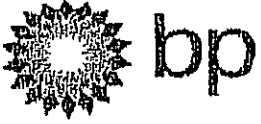
date

BTS

12/17/03

unloaded by

signature [Signature]



# WELLHEAD INSPECTION CHECKLIST BP / GEM

Date 12/17/03

Site Address 5131 Shattuck Ave., Oakland

Job Number 031217-PC1

Technician P. Cornish

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Debris Removed From Wellbox	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)
MW-1	X							
MW-2	X							
MW-3	X							
MW-4							✓	
MW-5	X							
MW-6	X							
MW-7	X							

NOTES: MW-4 Repair order submitted

**ATTACHMENT B**

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

## **LABORATORY PROCEDURES**

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### **Laboratory Procedures**

The groundwater samples were analyzed for the presence of the chemicals mentioned in 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 the Atlantic Richfield Company have been reviewed and verified by that laboratory.



31 December, 2003

Scott Robinson  
URS Corporation [Arco]  
500 12th Street, Suite 200  
Oakland, CA 94607

RE: ARCO #6148, Oakland, CA  
Work Order: MML0595

Enclosed are the results of analyses for samples received by the laboratory on 12/18/03 15:40. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads "Theresa Allen".

Theresa Allen  
Project Manager

CA ELAP Certificate #1210



URS Corporation [Arco]  
500 12th Street, Suite 200  
Oakland CA, 94607

Project: ARCO #6148, Oakland, CA  
Project Number: INTRIM - 50769  
Project Manager: Scott Robinson

MML0595  
**Reported:**  
12/31/03 16:55

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	MML0595-01	Water	12/17/03 10:00	12/18/03 15:40
MW-2	MML0595-02	Water	12/17/03 09:50	12/18/03 15:40
MW-3	MML0595-03	Water	12/17/03 10:10	12/18/03 15:40
MW-5	MML0595-04	Water	12/17/03 09:20	12/18/03 15:40

There were no custody seals that were received with this project.

URS Corporation [Arco]  
500 12th Street, Suite 200  
Oakland CA, 94607

Project: ARCO #6148, Oakland, CA  
Project Number: INTRIM - 50769  
Project Manager: Scott Robinson

MML0595  
**Reported:**  
12/31/03 16:55

**Volatile Organic Compounds by EPA Method 8260B**  
**Sequoia Analytical - Morgan Hill**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-1 (MML0595-01) Water    Sampled: 12/17/03 10:00    Received: 12/18/03 15:40</b>									
Ethanol	ND	100	ug/l	1	3L30001	12/30/03	12/30/03	EPA 8260B	O-12
tert-Butyl alcohol	ND	20	"	"	"	"	"	"	"
<b>Methyl tert-butyl ether</b>	<b>2.5</b>	0.50	"	"	"	"	"	"	"
Di-isopropyl ether	ND	0.50	"	"	"	"	"	"	"
Ethyl tert-butyl ether	ND	0.50	"	"	"	"	"	"	"
tert-Amyl methyl ether	ND	0.50	"	"	"	"	"	"	"
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	"
1,2-Dibromoethane (EDB)	ND	0.50	"	"	"	"	"	"	"
Benzene	ND	0.50	"	"	"	"	"	"	"
Toluene	ND	0.50	"	"	"	"	"	"	"
Ethylbenzene	ND	0.50	"	"	"	"	"	"	"
Xylenes (total)	ND	0.50	"	"	"	"	"	"	"
Gasoline Range Organics	ND	50	"	"	"	"	"	"	"
<i>Surrogate: 1,2-Dichloroethane-d4</i>		87.0 %		78-129	"	"	"	"	"
<b>MW-2 (MML0595-02) Water    Sampled: 12/17/03 09:50    Received: 12/18/03 15:40</b>									
Ethanol	ND	100	ug/l	1	3L29001	12/26/03	12/27/03	EPA 8260B	
tert-Butyl alcohol	ND	20	"	"	"	"	"	"	"
<b>Methyl tert-butyl ether</b>	<b>2.4</b>	0.50	"	"	"	"	"	"	"
Di-isopropyl ether	ND	0.50	"	"	"	"	"	"	"
Ethyl tert-butyl ether	ND	0.50	"	"	"	"	"	"	"
tert-Amyl methyl ether	ND	0.50	"	"	"	"	"	"	"
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	"
1,2-Dibromoethane (EDB)	ND	0.50	"	"	"	"	"	"	"
<b>Benzene</b>	<b>1.0</b>	0.50	"	"	"	"	"	"	"
Toluene	ND	0.50	"	"	"	"	"	"	"
Ethylbenzene	ND	0.50	"	"	"	"	"	"	"
Xylenes (total)	ND	0.50	"	"	"	"	"	"	"
Gasoline Range Organics	<b>51</b>	50	"	"	"	"	"	"	"
<i>Surrogate: 1,2-Dichloroethane-d4</i>		102 %		78-129	"	"	"	"	"

URS Corporation [Arco]  
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 MML0595  
 Reported:  
 12/31/03 16:55

**Volatile Organic Compounds by EPA Method 8260B**  
**Sequoia Analytical - Morgan Hill**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>MW-3 (MML0595-03) Water    Sampled: 12/17/03 10:10    Received: 12/18/03 15:40</b>									
Ethanol	ND	100	ug/l	1	3L29001	12/26/03	12/27/03	EPA 8260B	
tert-Butyl alcohol	ND	20	"	"	"	"	"	"	"
Methyl tert-butyl ether	4.8	0.50	"	"	"	"	"	"	"
Di-isopropyl ether	ND	0.50	"	"	"	"	"	"	"
Ethyl tert-butyl ether	ND	0.50	"	"	"	"	"	"	"
tert-Amyl methyl ether	ND	0.50	"	"	"	"	"	"	"
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	"
1,2-Dibromoethane (EDB)	ND	0.50	"	"	"	"	"	"	"
Benzene	0.51	0.50	"	"	"	"	"	"	"
Toluene	ND	0.50	"	"	"	"	"	"	"
Ethylbenzene	ND	0.50	"	"	"	"	"	"	"
Xylenes (total)	ND	0.50	"	"	"	"	"	"	"
Gasoline Range Organics	340	50	"	"	"	"	"	"	"
<i>Surrogate: 1,2-Dichloroethane-d4</i>		106 %	78-129	"	"	"	"	"	"
<b>MW-5 (MML0595-04) Water    Sampled: 12/17/03 09:20    Received: 12/18/03 15:40</b>									
Ethanol	ND	100	ug/l	1	3L30001	12/30/03	12/30/03	EPA 8260B	O-12
tert-Butyl alcohol	ND	20	"	"	"	"	"	"	"
Methyl tert-butyl ether	1.8	0.50	"	"	"	"	"	"	"
Di-isopropyl ether	ND	0.50	"	"	"	"	"	"	"
Ethyl tert-butyl ether	ND	0.50	"	"	"	"	"	"	"
tert-Amyl methyl ether	ND	0.50	"	"	"	"	"	"	"
1,2-Dichloroethane	ND	0.50	"	"	"	"	"	"	"
1,2-Dibromoethane (EDB)	ND	0.50	"	"	"	"	"	"	"
Benzene	ND	0.50	"	"	"	"	"	"	"
Toluene	ND	0.50	"	"	"	"	"	"	"
Ethylbenzene	ND	0.50	"	"	"	"	"	"	"
Xylenes (total)	ND	0.50	"	"	"	"	"	"	"
Gasoline Range Organics	ND	50	"	"	"	"	"	"	"
<i>Surrogate: 1,2-Dichloroethane-d4</i>		86.6 %	78-129	"	"	"	"	"	"



URS Corporation [Arco]  
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Project: ARCO #6148, Oakland, CA  
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Project Manager: Scott Robinson

MML0595  
Reported:  
12/31/03 16:55

**Volatile Organic Compounds by EPA Method 8260B - Quality Control  
Sequoia Analytical - Morgan Hill**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%RBC Limits	RPD	RPD Limit	Notes
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**Batch 3L29001 - EPA 5030B P/T**

**Blank (3L29001-BLK1)**

Prepared & Analyzed: 12/26/03

Ethanol	ND	100	ug/l							
tert-Butyl alcohol	ND	20	"							
Methyl tert-butyl ether	ND	0.50	"							
Di-isopropyl ether	ND	0.50	"							
Ethyl tert-butyl ether	ND	0.50	"							
tert-Amyl methyl ether	ND	0.50	"							
1,2-Dichloroethane	ND	0.50	"							
1,2-Dibromoethane (EDB)	ND	0.50	"							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Gasoline Range Organics	ND	50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.04		"	5.00		101	78-129			

**Laboratory Control Sample (3L29001-BS1)**

Prepared & Analyzed: 12/26/03

Ethanol	187	100	ug/l	200		93.5	31-186			
tert-Butyl alcohol	47.4	20	"	50.0		94.8	0-206			
Methyl tert-butyl ether	10.3	0.50	"	10.0		103	63-137			
Di-isopropyl ether	9.58	0.50	"	10.0		95.8	76-130			
Ethyl tert-butyl ether	10.4	0.50	"	10.0		104	61-141			
tert-Amyl methyl ether	9.67	0.50	"	10.0		96.7	56-140			
1,2-Dichloroethane	9.78	0.50	"	10.0		97.8	77-136			
1,2-Dibromoethane (EDB)	10.8	0.50	"	10.0		108	77-132			
Benzene	9.72	0.50	"	10.0		97.2	78-124			
Toluene	9.98	0.50	"	10.0		99.8	78-129			
Ethylbenzene	9.70	0.50	"	10.0		97.0	84-117			
Xylenes (total)	29.1	0.50	"	30.0		97.0	83-125			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.19		"	5.00		104	78-129			

URS Corporation [Arco]  
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Project Manager: Scott Robinson

MML0595  
Reported:  
12/31/03 16:55

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Sequoia Analytical - Morgan Hill**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3L29001 - EPA 5030B P/T**

**Laboratory Control Sample (3L29001-BS2)**

Prepared & Analyzed: 12/26/03

Methyl tert-butyl ether	9.12	0.50	ug/l	9.92		91.9	63-137			
Benzene	5.33	0.50	"	6.40		83.3	78-124			
Toluene	33.1	0.50	"	29.7		111	78-129			
Ethylbenzene	8.09	0.50	"	6.96		116	84-117			
Xylenes (total)	40.4	0.50	"	33.7		120	83-125			
Gasoline Range Organics	439	50	"	440		99.8	70-113			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>5.14</i>		<i>"</i>	<i>5.00</i>		<i>103</i>	<i>78-129</i>			

**Laboratory Control Sample Dup (3L29001-BSD1)**

Prepared & Analyzed: 12/26/03

Ethanol	210	100	ug/l	200		105	31-186	11.6	37	
tert-Butyl alcohol	50.7	20	"	50.0		101	0-206	6.73	22	
Methyl tert-butyl ether	10.0	0.50	"	10.0		100	63-137	2.96	13	
Di-isopropyl ether	9.11	0.50	"	10.0		91.1	76-130	5.03	9	
Ethyl tert-butyl ether	10.0	0.50	"	10.0		100	61-141	3.92	9	
tert-Amyl methyl ether	9.57	0.50	"	10.0		95.7	56-140	1.04	12	
1,2-Dichloroethane	10.3	0.50	"	10.0		103	77-136	5.18	13	
1,2-Dibromoethane (EDB)	10.4	0.50	"	10.0		104	77-132	3.77	9	
Benzene	9.25	0.50	"	10.0		92.5	78-124	4.96	12	
Toluene	10.0	0.50	"	10.0		100	78-129	0.200	10	
Ethylbenzene	9.42	0.50	"	10.0		94.2	84-117	2.93	10	
Xylenes (total)	30.7	0.50	"	30.0		102	83-125	5.35	11	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>5.30</i>		<i>"</i>	<i>5.00</i>		<i>106</i>	<i>78-129</i>			

**Laboratory Control Sample Dup (3L29001-BSD2)**

Prepared & Analyzed: 12/26/03

Methyl tert-butyl ether	8.64	0.50	ug/l	9.92		87.1	63-137	5.41	13	
Benzene	5.15	0.50	"	6.40		80.5	78-124	3.44	12	
Toluene	31.2	0.50	"	29.7		105	78-129	5.91	10	
Ethylbenzene	7.35	0.50	"	6.96		106	84-117	9.59	10	
Xylenes (total)	36.6	0.50	"	33.7		109	83-125	9.87	11	
Gasoline Range Organics	395	50	"	440		89.8	70-113	10.6	9	QR-02
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>5.16</i>		<i>"</i>	<i>5.00</i>		<i>103</i>	<i>78-129</i>			

URS Corporation [Arco]  
 500 12th Street, Suite 200  
 Oakland CA, 94607

 Project: ARCO #6148, Oakland, CA  
 Project Number: INTRIM - 50769  
 Project Manager: Scott Robinson

 MML0595  
 Reported:  
 12/31/03 16:55

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Sequoia Analytical - Morgan Hill**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3L30001 - EPA 5030B P/T**
**Blank (3L30001-BLK1)**

Prepared &amp; Analyzed: 12/30/03

Ethanol	ND	100	ug/l							O-12
tert-Butyl alcohol	ND	20	"							
Methyl tert-butyl ether	ND	0.50	"							
Di-isopropyl ether	ND	0.50	"							
Ethyl tert-butyl ether	ND	0.50	"							
tert-Amyl methyl ether	ND	0.50	"							
1,2-Dichloroethane	ND	0.50	"							
1,2-Dibromoethane (EDB)	ND	0.50	"							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Gasoline Range Organics	ND	50	"							
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>4.19</i>		<i>"</i>	<i>5.00</i>		<i>83.8</i>	<i>78-129</i>			

**Laboratory Control Sample (3L30001-BS1)**

Prepared &amp; Analyzed: 12/30/03

Ethanol	323	100	ug/l	200		162	31-186			O-12
tert-Butyl alcohol	63.3	20	"	50.0		127	0-206			
Methyl tert-butyl ether	9.17	0.50	"	10.0		91.7	63-137			
Di-isopropyl ether	11.5	0.50	"	10.0		115	76-130			
Ethyl tert-butyl ether	9.94	0.50	"	10.0		99.4	61-141			
tert-Amyl methyl ether	9.09	0.50	"	10.0		90.9	56-140			
1,2-Dichloroethane	8.14	0.50	"	10.0		81.4	77-136			
1,2-Dibromoethane (EDB)	10.0	0.50	"	10.0		100	77-132			
Benzene	9.33	0.50	"	10.0		93.3	78-124			
Toluene	9.45	0.50	"	10.0		94.5	78-129			
Ethylbenzene	9.94	0.50	"	10.0		99.4	84-117			
Xylenes (total)	31.1	0.50	"	30.0		104	83-125			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>4.40</i>		<i>"</i>	<i>5.00</i>		<i>88.0</i>	<i>78-129</i>			

URS Corporation [Arco]  
500 12th Street, Suite 200  
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Project: ARCO #6148, Oakland, CA  
Project Number: INTRIM - 50769  
Project Manager: Scott Robinson

MML0595  
Reported:  
12/31/03 16:55

**Volatile Organic Compounds by EPA Method 8260B - Quality Control  
Sequoia Analytical - Morgan Hill**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3L30001 - EPA 5030B P/T**

**Laboratory Control Sample (3L30001-BS2)**

Prepared & Analyzed: 12/30/03

Methyl tert-butyl ether	8.37	0.50	ug/l	9.92		84.4	63-137			
Benzene	5.45	0.50	"	6.40		85.2	78-124			
Toluene	31.9	0.50	"	29.7		107	78-129			
Ethylbenzene	8.06	0.50	"	6.96		116	84-117			
Xylenes (total)	38.7	0.50	"	33.7		115	83-125			
Gasoline Range Organics	429	50	"	440		97.5	70-113			
Surrogate: 1,2-Dichloroethane-d4	4.26		"	5.00		85.2	78-129			

URS Corporation [Arco]  
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MML0595  
Reported:  
12/31/03 16:55

#### Notes and Definitions

- O-12 The continuing calibration verification was outside of client contractual acceptance limits by 29.1% high. However, it was within method acceptance limits. The data should still be useful for its intended purpose.
- QR-02 The RPD result exceeded the control limits; however, both percent recoveries were acceptable. Sample results for the QC batch were accepted based on percent recoveries and completeness of QC data.
- 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



# Chain of Custody Record

MML0595

Project Name 0148 GWM  
 BP BU/GEM CO Portfolio Retail  
 BP Laboratory Contract Number: Atlantic Richfield Company

On-site Time: <u>7:10</u>	Temp: <u>60°F</u>
Off-site Time: <u>11:55</u>	Temp: <u>70°F</u>
Sky Conditions: <u>Clear</u>	
Meteorological Events: <u>none</u>	
Wind Speed: <u>5 mph</u>	Direction: <u>SE</u>

Date: 10/17/03 Requested Due Date (mm/dd/yy) 14 day TAT

Send To:	BP/GEM Facility No.: <u>ARCO 6148</u>	Consultant/Contractor: <u>URS</u>
Lab Name: <u>SEQUOIA</u>	BP/GEM Facility Address: <u>5131 Shattuck Ave, OAKLAND, CA</u>	Address: <u>500 12th St, Ste. 200</u>
Lab Address: <u>885 Jarvis Dr.</u>	Site ID No. <u>ARCO 6148</u>	<u>Oakland, CA 94609-4014</u>
<u>Morgan Hill, CA 95037</u>	Site Lat/Long:	e-mail EDD: <u>donna.casper@URSCorp.com</u>
	California Global ID #: <u>T0600100103</u>	Consultant/Contractor Project No.: <u>15-00006148.01 00427</u>
Lab PM Theresa Allen	BP/GEM PM Contact: <u>PAUL SUPPLE</u>	Consultant Tele/Fax: <u>510-893-3600/510-874-3268</u>
Tele/Fax: <u>408-778-9600 / 408-782-6308</u>	Address: <u>P.O. Box 6549</u>	Consultant/Contractor PM: <u>Scott Robinson</u>
Report Type & QC Level: <u>1 Send EDF Reports</u>	<u>Moraga, CA 94570</u>	Invoice to: Consultant/Contractor of <u>BP/GEM</u> (Circle one)
BP/GEM Account No.:	Tele/Fax: <u>925-299-8891/925-200-8872</u>	BP/GEM Work Release No: <u>INTRJM -50769</u>

Item No.	Sample Description	Time	Matrix				Laboratory No.	No. of containers	Preservatives				Requested Analysis							Sample Point Lat/Long and Comments
			Soil/Solid	Water/Liquid	Sediments	Air			Unpreserved	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	TPH-G / BITEX (8015/8021) (\$260)	TPH-D (8015)	MTBE (8021)	MTBE (8260)	MTBE, TAME, ETBE DIBP, TBA (8260)	1,2-DCA & EDB (8260)	Benzene (8260)	
1	MW-1 ✓	1000	X				3					X			X	X	X			
2	MW-2 ✓	950	X				1					X			X	X	X			
3	MW-3 ✓	1010	X				1					X			X	X	X			
4	MW-5 ✓	920	X				1					X			X	X	X			
5																				
6																				
7																				
8																				
9																				
10																				

Sampler's Name: <u>P. Cornetti</u>	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: <u>Blaine Tech</u>	<u>Paul Supple (URS)</u>	<u>12/18/03</u>	<u>10:50</u>	<u>[Signature]</u>	<u>12/18/03</u>	<u>10:50</u>
Shipment Date:	<u>[Signature]</u>	<u>12/19/03</u>	<u>15:40</u>	<u>[Signature]</u>	<u>12/18/03</u>	<u>15:40</u>
Shipment Method:						
Tracking No.:						

Notes: Address Invoice to BP/GEM but send to URS for approval

Yes  No  Temperature Blank Yes  No  Cooler Temperature on Receipt  F/C Trip Blank Yes  No

# SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: BP  
 REC-BY (PRINT) RL  
 WORKORDER: MMLO595

DATE REC'D AT LAB: 12/18/03  
 TIME REC'D AT LAB: 1540  
 DATE LOGGED IN: 12-18-03

DRINKING WATER for  
 regulatory purposes: YES  NO  
 WASTE WATER for  
 regulatory purposes: YES /  NO

CIRCLE THE APPROPRIATE RESPONSE		LAB SAMPLE #	DASH #	CLIENT ID	CONTAINER DESCRIPTION	PRESERVATIVE	SAMPLE MATRIX	DATE SAMPLED	REMARKS: CONDITION (ETC.)
1. Custody Seal(s)	Present / <input checked="" type="checkbox"/> Absent Intact / Broken*	01		MW1	(3) Vials	HU	L	12/17/03	329620
2. Chain-of-Custody	Present / <input checked="" type="checkbox"/> Absent*	02		1 2	L	L	L	L	L
3. Traffic Reports or Packing List	Present / <input checked="" type="checkbox"/> Absent	03		1 3	L	L	L	L	L
4. Airbill:	Airbill / Sticker Present / <input checked="" type="checkbox"/> Absent*	04		1 5	L	L	L	L	L
5. Airbill #:									
6. Sample Labels:	Present / <input checked="" type="checkbox"/> Absent								
7. Sample IDs:	Listed / Not Listed on Chain-of-Custody								
8. Sample Condition:	Intact / Broken* / Leaking*								
9. Does information on chain-of-custody, traffic reports and sample labels agree?	<input checked="" type="checkbox"/> Yes / No*								
10. Sample received within hold time:	<input checked="" type="checkbox"/> Yes / No*								
11. Adequate sample volume received?	<input checked="" type="checkbox"/> Yes / No*								
12. Proper Preservatives used:	<input checked="" type="checkbox"/> Yes / No*								
13. Temp Rec. at Lab: Is temp 4 ±1-2°C?	<u>5°C</u> <input checked="" type="checkbox"/> Yes / No**								

(Acceptance range for samples requiring thermal pres.)

\*\*Exception (if any): METALS / OFF-ON ICE  
 x Problem COC

\*IF CIRCLED, CONTACT PROJECT MANAGER AND ATTACH RECORD OF RESOLUTION.

4.xls

11/10/03

3 (03/18/03)

**ATTACHMENT C**

**HISTORICAL GROUNDWATER 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							Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
						Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)		
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	90.75	<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	91.95	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-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	89.83	480	82	48	8	48	87	--		
MW-2	08-14-96	107.28	17.00	ND	90.23	130	22	4	2	9	120	--		

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**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			Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)
						Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)						
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-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	--		
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	--		

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**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-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-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	90.73	<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									
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-5	03-20-95	106.68	14.92	ND	91.76	21,000	6,900	450	800	1,300	--	--			

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**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			Ethyl- benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TRPH (mg/L)	Dissolved Oxygen (mg/L)	Purged/ Not Purged (P/NP)	
						Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)							
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-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	--			
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									

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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	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									3.94
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	--			
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									

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**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	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								1.97	
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  
BTX: 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).*

**ATTACHMENT D**

**EDCC REPORT AND EDF/GEOWELL SUBMITTAL CONFIRMATION**

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## Error Summary Log

01/02/04

EDF 1.2i All files present in deliverable.

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Laboratory:	Sequoia Analytical Laboratories, Inc., Morgan Hill, CA
Project Name:	ARCO #6148, Oakland, CA
Work Order Number:	MML0595
Global ID:	T0600100103
Lab Report Number:	MML0595123120031655



## Report Summary

Labreport	Sampid	Labsampid	Mtrx	QC	Anmcode	Exmcode	Logdate	Extdate	Anadate	Labiocfl	Run	Sub
MML05951231200 MW-1 31655		MML059501	W	CS	8260TPH	SW5030B	12/17/03	12/30/03	12/30/03	3L30001	1	
MML05951231200 MW-2 31655		MML059502	W	CS	8260TPH	SW5030B	12/17/03	12/26/03	12/27/03	3L29001	1	
MML05951231200 MW-3 31655		MML059503	W	CS	8260TPH	SW5030B	12/17/03	12/26/03	12/27/03	3L29001	1	
MML05951231200 MW-5 31655		MML059504	W	CS	8260TPH	SW5030B	12/17/03	12/30/03	12/30/03	3L30001	1	
		3L29001BSD1	WQ	BD1	8260TPH	SW5030B	//	12/26/03	12/26/03	3L29001	1	
		3L29001BSD2	WQ	BD2	8260TPH	SW5030B	//	12/26/03	12/26/03	3L29001	1	
		3L29001BS1	WQ	BS1	8260TPH	SW5030B	//	12/26/03	12/26/03	3L29001	1	
		3L29001BS2	WQ	BS2	8260TPH	SW5030B	//	12/26/03	12/26/03	3L29001	1	
		3L29001BLK1	WQ	LB1	8260TPH	SW5030B	//	12/26/03	12/26/03	3L29001	1	
		3L30001BS1	WQ	BS1	8260TPH	SW5030B	//	12/30/03	12/30/03	3L30001	1	
		3L30001BS2	WQ	BS2	8260TPH	SW5030B	//	12/30/03	12/30/03	3L30001	1	
		3L30001BLK1	WQ	LB1	8260TPH	SW5030B	//	12/30/03	12/30/03	3L30001	1	

# EDFSAMP: Error Summary Log

01/02/04

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

# EDFTEST: Error Summary Log

01/02/04

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

# EDFRES: Error Summary Log

01/02/04

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

# EDFQC: Error Summary Log

01/02/04

Error type	Labiqtcl	Anmcode	Parlabel	Qccode	Labqid
There are no errors in this data files					

# EDFCL: Error Summary Log

01/02/04

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

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### UPLOADING A GEO\_WELL FILE

**Processing is complete. No errors were found!  
Your file has been successfully submitted!**

**Submittal Title:** 4th Quarter 2003 Geowell Data for site #6148

**Submittal Date/Time:** 12/23/2003 12:13:28 PM

**Confirmation Number:** 3791142106

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Your EDF file has been successfully uploaded!

**Confirmation Number:** 8707236945  
**Date/Time of Submittal:** 1/19/2004 2:48:48 PM  
**Facility Global ID:** T0600100103  
**Facility Name:** ARCO  
**Submittal Title:** 4th Quarter 2003 Groundwater Monitoring Data  
**Submittal Type:** GW Monitoring Report

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