



**Chevron**

9-0076-0 11 2 37

December 7, 1994

**Chevron U.S.A. Products Company**  
6001 Bollinger Canyon Rd., Bldg. L  
P.O. Box 5004  
San Ramon, CA 94583-0804

**Site Assessment & Remediation Group**  
Phone (510) 842-9500

Mr. Barney Chan  
Alameda County Health Care Services  
Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 44502-0577

#103

**Re: Chevron Service Station #9-0076  
4265 Foothill Boulevard, Oakland, CA**

Dear Mr. Chan:

Enclosed is the Groundwater Monitoring and Sampling Activities report dated October 27, 1994, prepared by our consultant Groundwater Technology, Inc. for the above referenced site. As indicated in the report, ground water samples collected were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and BTEX. Dissolved concentrations of these constituents observed during the past quarter are consistent with historical sampling results. Depth to ground water was measured at approximately 20.3 to 32.8 feet below grade.

As indicated in previous Chevron correspondence responding to your letter of May 6, 1994, Chevron is very willing to meet with Alameda County Health Care Services and any other interested parties to develop mutual remediation goals for the Chevron site and the adjacent BP and Shell sites. I look forward to hearing from your office soon regarding available meeting dates.

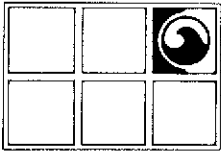
Chevron will continue to monitor and sample all wells at this site on a quarterly basis. If you have any questions or comments, please do not hesitate to contact me at (510) 842-8134.

Sincerely,  
CHEVRON U.S.A. PRODUCTS COMPANY

Mark A. Miller  
Site Assessment and Remediation Engineer

Enclosure

cc: Mr. Mike Cooke, Weiss Associates  
Mr. S.A. Willer



# GROUNDWATER TECHNOLOGY, INC.

4057 Port Chicago Highway, Concord, CA 94520 (415) 671-2387

FAX: (415) 685-9148

October 27, 1994

Project No. 020104102

Mr. Mark Miller  
Chevron U.S.A. Products Company  
2410 Camino Ramon  
San Ramon, CA 94583-0804


**SUBJECT:** *Groundwater Monitoring and Sampling Activities*  
Chevron Service Station No. 9-0076  
4265 Foothill Boulevard, Oakland, California

Dear Mr. Miller:

Groundwater Technology, Inc. presents the quarterly groundwater monitoring and sampling data collected on September 22, 1994. Eight groundwater wells were gauged to measure depth to groundwater (DTW) and to check for separate-phase hydrocarbons. Separate-phase hydrocarbons were not detected in the monitoring wells. A potentiometric surface map and a summary of groundwater monitoring data are presented in attachments 1 and 2, respectively. Monitoring data for the adjacent Shell station from Pacific Environmental Group, Inc. is also summarized in attachment 2. After the DTW was measured, each monitoring well was purged and sampled. Groundwater monitoring and sample collection protocol and field data sheets are presented in attachment 3. The groundwater samples were analyzed for benzene, toluene, ethylbenzene, xylenes, and total petroleum hydrocarbons-as-gasoline. The laboratory report and chain-of-custody record are included in attachment 4. Monitoring-well purge water was transported by Groundwater Technology to the Chevron Terminal in Richmond, California, for recycling.

Groundwater Technology is pleased to assist Chevron on this project. If you have any questions or comments, please contact our Concord office at (510) 671-2387.

Sincerely,  
**Groundwater Technology, Inc.**  
Written/Submitted by

  
Kenneth P. Johnson  
Project Manager

PR 

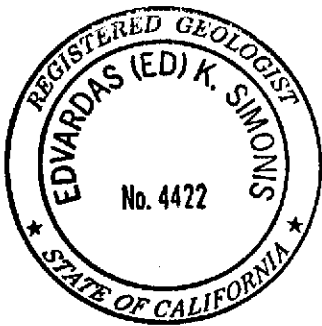
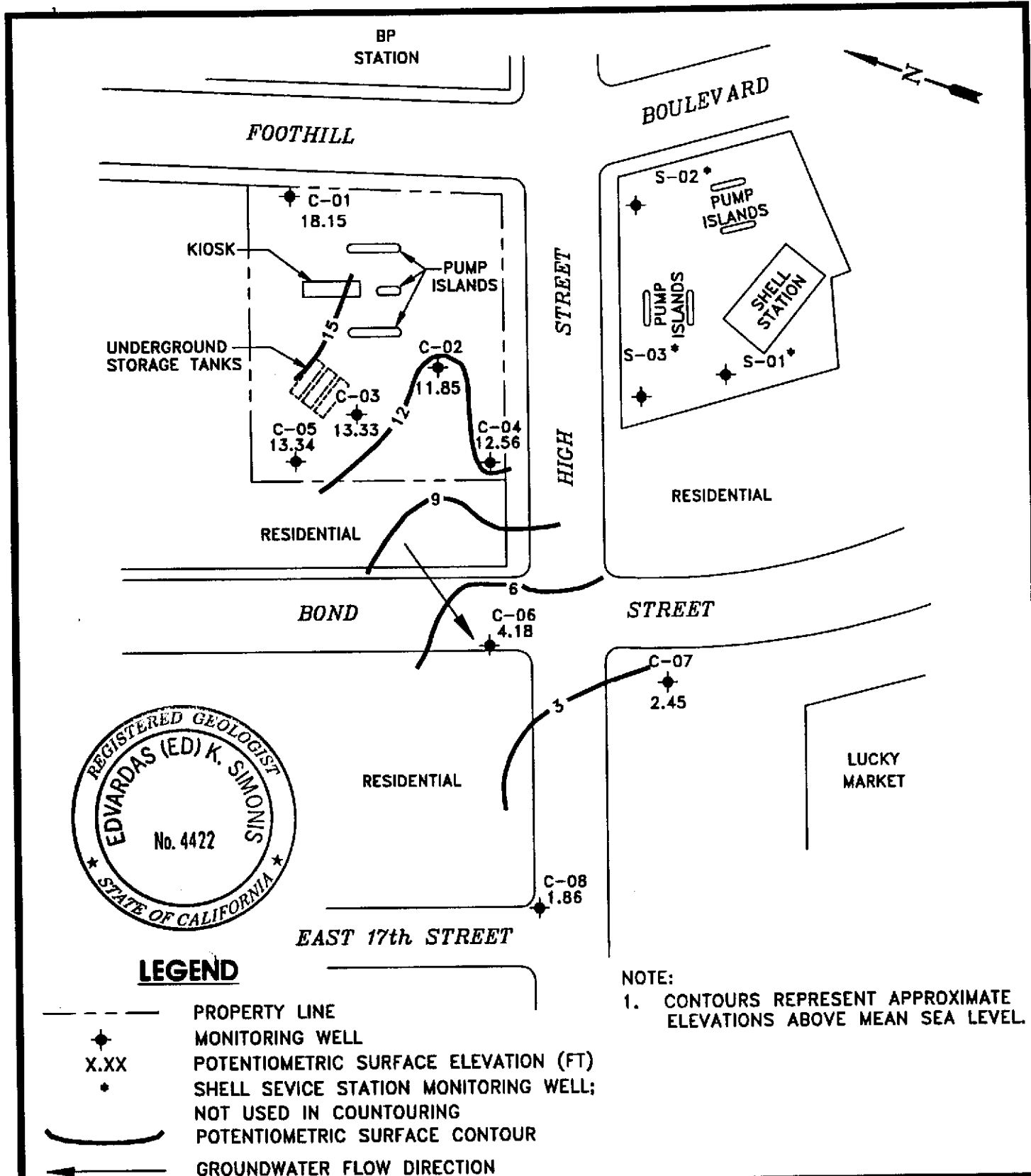
Attachment 1 Figure  
Attachment 2 Table  
Attachment 3 Protocol and Field Data Sheets  
Attachment 4 Laboratory Report

For:  
Wendell W. Lattz  
Vice President, General Manager  
West Region

4102qmsr.394

**ATTACHMENT 1**

**Figure**



**LEGEND**

- PROPERTY LINE
- ◆ X.XX MONITORING WELL  
POTENTIOMETRIC SURFACE ELEVATION (FT)
- SHELL SERVICE STATION MONITORING WELL;  
NOT USED IN COUNTOURING
- POTENTIOMETRIC SURFACE CONTOUR
- ← GROUNDWATER FLOW DIRECTION

NOTE:  
1. CONTOURS REPRESENT APPROXIMATE ELEVATIONS ABOVE MEAN SEA LEVEL.



**GROUNDWATER TECHNOLOGY**



**POTENTIOMETRIC SURFACE MAP (9/22/94)**

CLIENT: CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION NO. 9-0076	FILE: 4102PSM, (1:80)	PROJECT NO.: 02010-4102	PM KS	PE/RG EKS
	REV.	FIGURE: 1		
LOCATION: 4265 FOOTHILL BOULEVARD OAKLAND, CALIFORNIA	DES. SS	DET. SS	DATE: 9/23/94	

**ATTACHMENT 2**

**Table**

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**Chevron Service Station No. 9-0076**  
**4265 Foothill Boulevard, Oakland, California**

Well ID/ Elev	Date	TPH-G	Benzene	Toluene	Ethyl- benzene	Xylenes	DTW (ft)	SPT (ft)	WTE (ft)
C-1  35.42	04/28/89a	940	30	1.3	11	13	20.05	0.00	15.37
	08/08/89a	820	45	2	13	13	24.07	0.00	11.35
	12/21/89	---	---	---	---	---	22.81	0.00	12.61
	08/27/90	440	15	1	6	13	22.12	0.00	13.30
	11/04/90	---	---	---	---	---	25.56	0.00	9.86
	06/18/91	74	5.6	0.6	1.9	1.3	21.64	0.00	13.78
	09/19/91	150	7.1	<0.5	2.3	3	24.58	0.00	10.84
	12/20/91	250	10	<0.5	3.7	1.6	26.17	0.00	9.25
	03/18/92	190	16	<0.5	8.5	2.9	18.25	0.00	17.17
	07/14/92	20,000	480	2,200	510	2,900	27.61	0.00	7.81
	10/08/92	360	34	4.6	19	12	24.44	0.00	10.98
	01/08/93	120	9.1	0.5	5.1	1.8	19.68	0.00	15.74
	04/14/93	190	74	0.6	1	2	16.38	0.00	19.04
38.41	07/16/93	---	---	---	---	---	---	---	---
	07/27/93	300	12	<0.5	5	2	9.39	0.00	26.03
	09/21/93	360	12	1.2	5.8	3.7	21.42	0.00	16.99
	01/28/94	370	24	1	13	4	19.57	0.00	18.84
	03/17/94	460	42	<0.5	6.7	3.7	16.85	0.00	21.56
	06/16/94	320	20	0.7	8.7	3.0	17.83	0.00	20.58
	09/22/94	380	24	0.6	8.8	1.9	20.26	0.00	18.15

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**Chevron Service Station No. 9-0076**  
**4265 Foothill Boulevard, Oakland, California**

Well ID/ Elev	Date	TPH-G	Benzene	Toluene	Ethyl- benzene	Xylenes	DTW (ft)	SPT (ft)	WTE (ft)
C-2  35.18	04/28/89a	120,000	30,000	22,000	3,000	17,000	26.44	0.00	8.74
	08/08/89a	---	---	---	---	---	29.90	0.01	5.29
	12/21/89	---	---	---	---	---	29.32	0.00	5.86
	08/27/90	---	---	---	---	---	29.55	0.17	5.77
	11/04/90	---	---	---	---	---	30.47	0.00	4.71
	06/18/91	---	---	---	---	---	28.33	0.06	6.90
	09/19/91	---	---	---	---	---	29.39	0.06	5.84
	12/20/91	170,000	20,000	10,000	2,800	19,000	29.23	0.00	5.95
	03/18/92	---	---	---	---	---	13.60	0.09	21.58
	07/14/92	---	---	---	---	---	---	---	---
37.47	10/08/92	---	---	---	---	---	---	---	---
	01/08/93	79,000	14,000	7,200	3,500	16,000	24.20	Sheen	10.98
	04/14/93	---	---	---	---	---	---	---	---
	07/16/93	2,200	440	73	24	350	30.15	0.00	5.03
	**09/21/93	11,000	2,300	300	270	910	26.29	0.00	11.18
	01/28/94	49,000	11,000	3,900	1,600	12,000	23.96	0.00	13.51
	03/17/94	16,000	3,300	1,000	220	3,500	25.99	0.00	11.48
	06/16/94	20,000	4,800	1,500	520	4,300	23.92	0.00	13.55
	09/22/94	35,000	5,600	850	1,700	7,300	25.62	0.00	11.85

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**Chevron Service Station No. 9-0076**  
**4265 Foothill Boulevard, Oakland, California**

Well ID/ Elev	Date	TPH-G	Benzene	Toluene	Ethyl- benzene	Xylenes	DTW (ft)	SPT (ft)	WTE (ft)
C-3	04/28/89a	<500	1.7	<0.5	<0.5	<0.5	28.00	0.00	7.28
	08/08/89a	<500	1	<0.5	<0.5	<0.5	30.00	0.00	5.28
35.28	12/21/89	---	---	---	---	---	30.53	0.00	4.75
	08/27/90	<50	<0.3	<0.3	<0.3	<0.6	29.68	0.00	5.60
35.30	11/04/90	---	---	---	---	---	30.36	0.00	4.94
	06/18/91	52	1.1	<0.5	<0.5	1.2	28.46	0.00	6.84
	09/19/91	73	1.2	<0.5	<0.5	<0.5	29.33	0.00	5.97
	12/20/91	<50	0.7	<0.5	<0.5	<0.5	29.77	0.00	5.53
	03/18/92	<50	<0.5	<0.5	<0.5	<0.5	25.75	0.00	9.55
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	27.87	0.00	7.43
	10/08/92	<50	<0.5	<0.5	<0.5	0.5	28.55	0.00	6.75
	01/08/93	<50	<0.5	<0.5	<0.5	<0.5	25.85	0.00	9.45
	04/14/93	<50	<0.5	<0.5	<0.5	<0.5	23.96	0.00	11.34
	07/16/93	<50	<0.5	<0.5	<0.5	<0.5	25.64	0.00	9.66
38.37	**09/21/93	<50	0.7	<0.5	<0.5	<0.8	26.22	0.00	12.15
	01/28/94	<50	2	<0.5	<0.5	1	25.66	0.00	12.71
	03/17/94	<50	2.8	<0.5	0.6	1.5	24.95	0.00	13.42
	06/16/94	<50	1.4	<0.5	<0.5	<0.5	24.31	0.00	14.06
	09/22/94	<50	0.6	<0.5	<0.5	<0.5	25.04	0.00	13.33



**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**Chevron Service Station No. 9-0076**  
**4265 Foothill Boulevard, Oakland, California**

Well ID/ Elev	Date	TPH-G	Benzene	Toluene	Ethyl- benzene	Xylenes	DTW (ft)	SPT (ft)	WTE (ft)
C-4	01/12/89a	---	---	---	---	---	29.49	0.00	3.96
	04/12/89a	---	---	---	---	---	27.44	0.00	6.01
33.45	04/28/89	20,000	6,300	550	230	1,500	29.49	0.00	3.96
	08/08/89a	8,000	7,500	340	88	1,000	29.55	0.00	3.90
33.48	12/21/89	---	---	---	---	---	30.02	0.00	3.43
	08/27/90	26,000	10,000	280	410	1,400	29.02	0.00	4.46
	11/04/90	---	---	---	---	---	29.81	0.00	3.67
	06/18/91	34,000	14,000	410	450	1,300	27.45	0.00	6.03
	09/19/91	16,000	7,400	90	110	460	28.65	0.00	4.83
	12/20/91	24,000	12,000	120	260	740	28.84	0.00	4.64
	03/18/92	48,000	6,000	1,300	1,300	2,400	24.43	0.00	11.05
	07/14/92	40,000	14,000	920	550	2,400	26.89	0.00	6.59
	10/08/92	29,000	13,000	190	110	1,400	27.79	0.00	5.69
	01/08/93	25,000	7,000	630	860	1,800	23.50	0.00	9.98
36.49	04/14/93	*27,000	6,300	1,000	900	1,400	21.13	0.00	12.35
	07/16/93	28,000	7,800	1,100	830	2,100	23.96	0.00	9.52
	**09/21/93	30,000	9,600	130	390	1,300	25.51	0.00	10.98
	01/28/94	18,000	7,800	440	260	1,200	23.31	0.00	13.18
	03/17/94	32,000	7,800	820	820	1,800	21.35	0.00	15.14
	06/16/94	25,000	7,600	710	600	1,800	22.50	0.00	13.99
	09/22/94	25,000	7,800	140	600	1,100	23.93	0.00	12.56

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**Chevron Service Station No. 9-0076**  
**4265 Foothill Boulevard, Oakland, California**

Well ID/ Elev	Date	TPH-G	Benzene	Toluene	Ethyl- benzene	Xylenes	DTW (ft)	SPT (ft)	WTE (ft)
C-5  38.50	08/27/90	<50	<0.3	<0.3	<0.3	<0.6	29.83	0.00	5.67
	11/14/90	---	---	---	---	---	30.56	0.00	4.94
	06/18/91	<50	<0.5	<0.5	<0.5	<0.5	28.52	0.00	6.98
	09/19/91	<50	<0.5	<0.5	<0.5	<0.5	29.51	0.00	5.99
	12/20/91	<50	<0.5	<0.5	<0.5	<0.5	29.96	0.00	5.54
	03/18/92	<50	<0.5	<0.5	<0.5	<0.5	25.92	0.00	9.58
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	28.00	0.00	7.50
	10/08/92	<50	<0.5	<0.5	<0.5	<0.5	28.65	0.00	6.85
	01/08/93	<50	<0.5	<0.5	<0.5	<0.5	26.02	0.00	9.48
	04/14/93	<50	<0.5	<0.5	<0.5	<0.5	24.04	0.00	11.46
	07/16/93	<50	<0.5	<0.5	<0.5	<0.5	25.21	0.00	10.29
	**09/21/93	60	10	8.1	1.9	9.4	26.36	0.00	12.14
	01/28/94	<50	<0.5	<0.5	<0.5	<0.5	25.90	0.00	12.60
	03/17/94	<50	<0.5	<0.5	<0.5	<0.5	24.50	0.00	14.00
06/16/94	<50	<0.5	<0.5	<0.5	<0.5	24.40	0.00	14.10	
09/22/94	<50	<0.5	<0.5	<0.5	<0.5	25.16	0.00	13.34	
C-6  32.40         35.40	08/27/90	7,200	2,100	6	41	300	44.11	0.00	-11.71
	11/14/90	---	---	---	---	---	44.03	0.00	-11.63
	06/18/91	4,400	2,500	18	160	77	43.49	0.00	-11.09
	09/19/91	3,100	1,600	8.3	73	8	34.32	0.00	-1.92
	12/20/91	4,400	1,300	3.2	74	10	41.35	0.00	-8.95
	03/18/92	9,800	3,200	34	250	500	40.69	0.00	-8.29
	07/14/92	6,500	2,200	100	96	240	38.89	0.00	-6.49
	10/08/92	1,800	1,000	3.1	15	41	38.67	0.00	-6.27
	01/08/93	5,200	1,600	6.8	63	120	37.81	0.00	-5.41
	04/14/93	11,000	1,800	13	110	200	34.70	0.00	-2.30
	07/16/93	4,800	820	10	41	57	33.87	0.00	-1.47
	**09/21/93	4,100	1,200	<50	75	130	33.98	0.00	1.42
	01/28/94	3,100	930	14	40	34	33.86	0.00	1.54
	03/17/94	5,100	950	18	61	83	32.31	0.00	3.09
06/16/94	3,800	970	6.4	52	62	31.50	0.00	3.90	
09/22/94	4,100	980	7.8	43	48	31.22	0.00	4.18	

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**Chevron Service Station No. 9-0076**  
**4265 Foothill Boulevard, Oakland, California**

Well ID/ Elev	Date	TPH-G	Benzene	Toluene	Ethyl- benzene	Xylenes	DTW (ft)	SPT (ft)	WTE (ft)	
C-7	08/27/90	110	26	0.8	4	6	44.23	0.00	-12.06	
	11/14/90	---	---	---	---	---	44.11	0.00	-11.94	
32.17	06/18/91	23,000	5,700	420	1,000	2,800	42.05	0.00	-9.88	
	09/19/91	26,000	4,600	330	970	2,400	41.72	0.00	-9.55	
	12/20/91	33,000	5,500	270	1,000	2,100	41.67	0.00	-9.50	
	03/18/92	27,000	5,800	410	1,300	3,300	41.20	0.00	-9.03	
	07/14/92	46,000	12,000	720	1,700	4,600	39.77	0.00	-7.60	
	10/08/92	22,000	6,800	370	1,300	3,200	39.14	0.00	-6.97	
	01/08/93	36,000	7,600	540	1,700	4,200	38.50	0.00	-6.33	
	04/14/93	23,000	3,100	450	670	1,900	35.93	0.00	-3.76	
	07/16/93	19,000	3,200	330	550	1,800	35.38	0.00	-3.21	
	**09/21/93	17,000	2,700	160	410	760	35.46	0.00	-0.27	
35.19	01/28/94	14,000	1,800	210	390	1,000	35.45	0.00	-0.26	
	03/17/94	17,000	1,600	210	410	1,200	33.24	0.00	1.95	
	06/16/94	12,000	1,600	180	410	1,200	33.07	0.00	2.12	
	09/22/94	10,000	1,700	110	320	580	32.74	0.00	2.45	
	C-8	11/14/90	<50	<0.3	<0.3	<0.3	<0.6	43.29	0.00	-12.61
	30.68	06/18/91	<50	<0.5	<0.5	<0.5	<0.5	42.62	0.00	-11.94
09/19/91		<50	<0.5	<0.5	<0.5	<0.5	41.72	0.00	-11.04	
12/20/91		<50	<0.5	<0.5	<0.5	<0.5	40.98	0.00	-10.30	
03/18/92		<50	<0.5	<0.5	<0.5	<0.5	40.02	0.00	-9.34	
07/14/92		<50	<0.5	<0.5	<0.5	<0.5	39.02	0.00	-8.34	
10/08/92		<50	<0.5	<0.5	<0.5	1.1	38.68	0.00	-8.00	
01/08/93		<50	<0.5	<0.5	<0.5	<0.5	38.07	0.00	-7.39	
04/14/93		<50	<0.5	<0.5	<0.5	<0.5	35.99	0.00	-5.31	
07/16/93		<50	<0.5	<0.5	<0.5	<0.5	35.32	0.00	-4.64	
**09/21/93		<50	<0.5	<0.5	<0.5	<0.8	35.30	0.00	-0.62	
34.68	01/28/94	<50	<0.5	<0.5	<0.5	<0.5	35.61	0.00	-0.93	
	03/17/94	<50	<0.5	<0.5	<0.5	<0.5	34.37	0.00	0.31	
	06/16/94	<50	<0.5	<0.5	<0.5	<0.5	33.36	0.00	1.32	
	09/22/94	<50	<0.5	<0.5	<0.5	<0.5	32.82	0.00	1.86	

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**Chevron Service Station No. 9-0076**  
**4265 Foothill Boulevard, Oakland, California**

Well ID/ Elev	Date	TPH-G	Benzene	Toluene	Ethyl- benzene	Xylenes	DTW (ft)	SPT (ft)	WTE (ft)
TBLB	04/28/89	<500	<0.5	<0.5	<0.5	<0.5	---	---	---
	08/08/89	<500	<0.5	<0.5	<0.5	<0.5	---	---	---
	08/27/90	<50	<0.3	<0.3	<0.3	<0.6	---	---	---
	11/14/90	<50	<0.3	<0.3	<0.3	<0.6	---	---	---
	06/18/91	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	09/19/91	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	12/20/91	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	03/18/92	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	10/08/92	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	01/08/93	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	04/14/93	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	07/16/93	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	**09/21/93	<50	<0.5	<0.5	<0.5	<0.8	---	---	---
	01/28/94	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	03/17/94	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	06/16/94	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
09/22/94	<50	<0.5	<0.5	<0.5	<0.5	---	---	---	

TPH-G = Total petroleum hydrocarbons-as-gasoline  
DTW = Depth to groundwater  
SPT = Separate-phase hydrocarbon thickness  
WTE = Water-table elevation  
--- = Not applicable, not sampled, not measured  
\* = Uncategorized compound not included in gasoline hydrocarbon concentration.

All elevations are presented as feet above mean sea level.

Analytical results are in micrograms per liter, equivalent to parts per billion.

Top-of-casing elevations were surveyed September 21, 1993.

Data for April 28, 1989, through December 20, 1991, were taken from *Fourth Quarter 1991 Ground Water Monitoring Report*, dated January 30, 1992 (Weiss Associates).

**TABLE 2**  
**GROUNDWATER MONITORING DATA**  
 Shell Service Station  
 4411 Foothill Boulevard, Oakland, California

Well ID/Elev	Date	DTW (ft)	SPT (ft)	WTE (ft)
S-1 38.31	06/16/94 09/22/94	9.41 11.13	0.00 0.00	30.11 27.18
S-2 38.79	06/16/94 09/22/94	10.11 10.51	0.00 0.00	28.87 28.28
S-3 37.33	06/16/94 09/22/94	9.12 10.27	0.00 0.00	28.99 27.06

**ATTACHMENT 3**

**Groundwater Monitoring and Sample Collection Protocol  
and  
Field Data Sheets**

# GROUNDWATER TECHNOLOGY GROUNDWATER MONITORING AND SAMPLE COLLECTION PROTOCOL

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## Groundwater Monitoring

Groundwater monitoring is accomplished using a INTERFACE PROBE™ Well Monitoring System. The INTERFACE PROBE™ Well Monitoring System is a hand held, battery operated device for measuring the depth to separate-phase hydrocarbons and depth to water. The INTERFACE PROBE™ Well Monitoring System consists of a dual-sensing probe which utilizes an optical liquid sensor and electrical conductivity to distinguish between water and petroleum products.

Monitoring is accomplished by measuring from the surveyed top of well casing or grade to groundwater and separate-phase hydrocarbons if present. The static water elevation is then calculated for each well and a potentiometric surface map is constructed. If separate-phase hydrocarbons are detected the water elevation is adjusted by the following calculation:

$$(\text{Product thickness}) \times (0.8) + (\text{Water elevation}) = \text{Corrected water elevation}$$

Groundwater monitoring wells are monitored in order of wells with lowest concentrations of volatile organic compounds to wells with the highest concentrations, based upon historical concentrations. If separate-phase hydrocarbons are encountered in a well, the product is visually inspected to confirm and note color, amount, and viscosity. Monitoring equipment is washed with laboratory grade detergent and rinsed with distilled or deionized water before monitoring each well.

## Groundwater Sampling

Before groundwater samples are collected, sufficient water is purged from each well to ensure representative formation water is entering the well. Wells are purged and sampled in the same order as monitoring, from wells with the lowest concentrations of volatile organic compounds to wells with the highest concentrations. Wells are purged using either a polyvinyl chloride (PVC) bailer fitted with a check valve or with a stainless steel submersible Grundfos pump. The purge equipment is decontaminated before use in each well by washing with laboratory grade detergent and triple rinsing with deionized or distilled water. A minimum of 3 well-casing volumes of water are removed from each well while pH, electrical conductivity, and temperature are recorded to verify that "fresh" formation water is being sampled and the parameters have stabilized. If the well is low yielding, it may be purged dry and sampled before 3 casing volumes are purged. The wells are then allowed to recharge to approximately 80 percent of the initial water level before a sample is collected.

Groundwater samples are collected from each well using a new, prepackaged disposable bailer and string. The water sample is decanted from the bailer into laboratory-provided containers (appropriate for the analyses required) so that there is no headspace in the containers. Samples collected for benzene, toluene, ethylbenzene, xylene, and total petroleum hydrocarbons (TPH)-as-gasoline analyses are collected in 40-milliliter vials fitted with Teflon® septum lids. Samples are preserved with hydrochloric acid (HCL) to a pH of less than 2. Dissolved metals samples are filtered through a 0.45-micron paper filter in the field and preserved as required before submitting to the laboratory for analyses. All samples are labeled immediately upon collection and logged on the chain-of-custody record. Sample label and chain-of-custody recorded information includes the project name and number, sample identification, date and time of collection, analyses requested, and the sampler's name. Sample bottles are placed in plastic bags (to protect the bottles and labels) and on ice (frozen water) in an insulated cooler and are shipped under chain-of-custody protocol to the laboratory.

The chain-of-custody record documents who has possession of the samples until the analyses is performed. Other pertinent information is also noted for the laboratory use on the chain-of-custody record.

Trip blanks (TBLBs) are used for each project as a quality assurance/quality control measure. The TBLBs are prepared by the laboratory and are placed in the insulated cooler and accompany the field samples throughout the sampling event.



















**ATTACHMENT 4**  
**Laboratory Report**





# GTEL

ENVIRONMENTAL  
LABORATORIES, INC.

**Northwest Region**

4080-C Pike Lane  
Concord, CA 94520  
(510) 685-7852  
(800) 544-3422 *from inside California*  
(800) 423-7143 *from outside California*  
(510) 825-0720 (FAX)

October 6, 1994

Ken Johnson  
Groundwater Technology, Inc.  
4057 Port Chicago Hwy  
Concord, CA 94520

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RE: GTEL Client ID: 020104102  
Login Number: C4090400  
Project ID (number): 020104102  
Project ID (name): CHEVRON/#9-0076/Oakland, CA

---

Dear Ken Johnson:

Enclosed please find the analytical results for the samples received by GTEL Environmental Laboratories, Inc. on 09/26/94.

A formal Quality Assurance/Quality Control (QA/QC) program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified by the Department of Health Service under Certification Number E1075.

If you have any questions regarding this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,  
GTEL Environmental Laboratories, Inc.

Rashmi Shah  
Laboratory Director

GTEL Client ID: 020104102  
 Login Number: C4090400  
 Project ID (number): 020104102  
 Project ID (name): CHEVRON/#9-0076/Oakland, CA

ANALYTICAL RESULTS

Volatile Organics  
 Method: EPA 8020  
 Matrix: Aqueous

GTEL Sample Number	C4090400-01	C4090400-02	C4090400-03	C4090400-04
Client ID	C5	C8	C3	C1
Date Sampled	09/22/94	09/22/94	09/22/94	09/22/94
Date Analyzed	10/04/94	10/04/94	10/04/94	10/04/94
Dilution Factor	1.00	1.00	1.00	1.00

Analyte	Reporting		Concentration:				
	Limit	Units					
Benzene	0.5	ug/L	< 0.5	< 0.5	0.6	24.	
Toluene	0.5	ug/L	< 0.5	< 0.5	< 0.5	0.6	
Ethylbenzene	0.5	ug/L	< 0.5	< 0.5	< 0.5	8.8	
Xylenes (total)	0.5	ug/L	< 0.5	< 0.5	< 0.5	1.9	
TPH as GAS	50	ug/L	< 50	< 50	< 50	380	
BFB (Surrogate)	--	%	82.9	74.1	75.5	91.3	

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 8020:

"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, SW-846", Third Edition, Revision 1, US EPA November 1986. Acceptability limits for recovery in the Bromofluorobenzene (BFB) surrogate is 62-129%. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual protocols, May 1988 revision.

C4090400-03:

Uncategorized compound is not included in gasoline concentration.

GTEL Concord, CA  
 C4090400:1



GTEL Client ID: 020104102  
 Login Number: C4090400  
 Project ID (number): 020104102  
 Project ID (name): CHEVRON/#9-0076/Oakland, CA

ANALYTICAL RESULTS

Volatile Organics  
 Method: EPA 8020  
 Matrix: Aqueous

GTEL Sample Number	C4090400-05	C4090400-06	C4090400-07	C4090400-08
Client ID	C6	C7	C4	C2
Date Sampled	09/22/94	09/22/94	09/22/94	09/22/94
Date Analyzed	10/05/94	10/05/94	10/05/94	10/05/94
Dilution Factor	5.00	10.0	50.0	50.0

Analyte	Reporting		Concentration:			
	Limit	Units				
Benzene	0.5	ug/L	980	1700	7800	5600
Toluene	0.5	ug/L	7.8	110	140	850
Ethylbenzene	0.5	ug/L	43.	320	600	1700
Xylenes (total)	0.5	ug/L	48.	580	1100	7300
TPH as GAS	50.	ug/L	4100	10000	25000	35000
BFB (Surrogate)	--	%	95.3	101.	88.4	96.6

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 8020:

"Test Methods for Evaluating Solid Waste. Physical and Chemical Methods. SW-846". Third Edition, Revision 1, US EPA November 1986. Acceptability limits for recovery in the Bromofluorobenzene (BFB) surrogate is 62-129%. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual protocols, May 1988 revision.

GTEL Concord, CA  
 C4090400:2



GTEL Client ID: 020104102  
 Login Number: C4090400  
 Project ID (number): 020104102  
 Project ID (name): CHEVRON/#9-0076/Oakland, CA

ANALYTICAL RESULTS

Volatile Organics  
 Method: EPA 8020  
 Matrix: Aqueous

GTEL Sample Number	C4090400-09	--	--	--
Client ID	TBLB	--	--	--
Date Sampled	09/22/94	--	--	--
Date Analyzed	10/03/94	--	--	--
Dilution Factor	1.00	--	--	--

Analyte	Reporting		Concentration:		
	Limit	Units			
Benzene	0.5	ug/L	< 0.5	--	--
Toluene	0.5	ug/L	< 0.5	--	--
Ethylbenzene	0.5	ug/L	< 0.5	--	--
Xylenes (total)	0.5	ug/L	< 0.5	--	--
TPH as GAS	50.	ug/L	< 50.	--	--
BFB (Surrogate)	--	%	101.	--	--

Notes:

Dilution Factor:

Dilution factor indicates the adjustments made for sample dilution.

EPA 8020:

"Test Methods for Evaluating Solid Waste, Physical and Chemical Methods, SW-846", Third Edition, Revision 1, US EPA November 1986. Acceptability limits for recovery in the Bromofluorobenzene (BFB) surrogate is 62-129%. Modification for TPH as gasoline as per California State Water Resources Board LUFT Manual protocols, May 1988 revision.

GTEL Concord, CA  
 C4090400:3



GTEL Client ID: 020104102  
Login Number: C4090400  
Project ID (number): 020104102  
Project ID (name): CHEVRON/#9-0076/Oakland, CA

QUALITY CONTROL RESULTS

Volatile Organics  
Method: EPA 8020  
Matrix: Aqueous

Method Blank Results

QC Batch No: G100394-5  
Date Analyzed: 03-OCT-94

Analyte	Method: EPA 8020	Concentration: ug/L
Benzene	< 0.30	
Toluene	< 0.30	
Ethylbenzene	< 0.30	
Xylenes (Total)	< 0.50	
TPH as Gasoline	< 10.	

Notes:

GTEL Client ID: 020104102  
Login Number: C4090400  
Project ID (number): 020104102  
Project ID (name): CHEVRON/#9-0076/Oakland, CA

QUALITY CONTROL RESULTS

Volatile Organics  
Method: EPA 8020  
Matrix: Aqueous

Method Blank Results

QC Batch No: G100394-5  
Date Analyzed: 03-OCT-94

Analyte	Method: EPA 8020	Concentration: ug/L
Benzene	< 0.30	
Toluene	< 0.30	
Ethylbenzene	< 0.30	
Xylenes (Total)	< 0.50	
TPH as Gasoline	< 10.	

Notes:

GTEL Client ID: 020104102  
 Login Number: C4090400  
 Project ID (number): 020104102  
 Project ID (name): CHEVRON/#9-0076/Oakland, CA

QUALITY CONTROL RESULTS

Volatile Organics  
 Method: EPA 8020  
 Matrix: Aqueous

Matrix Spike and Matrix Spike Duplicate Results

Analyte	Original Concentration	Spike Amount	Matrix Spike	Matrix Spike	Matrix Spike Duplicate	Matrix Spike Duplicate	RPD. %	Acceptability Limits	
			Concentration	Recovery. %	Concentration	Recovery. %		RPD. %	Recovery. %
EPA 8020	GTEL Sample ID:C4090396-08		Spike ID:G100394-1		Dup. ID:G100394-2				
Units: ug/L	Analysis Date:29-SEP-94		04-OCT-94		04-OCT-94			Client ID:Batch QC	
Benzene	< 0.50	20.0	18.5	92.2	15.7	78.2	16.4	34	57.3-138%
Toluene	< 0.50	20.0	16.8	84.0	14.4	72.0	15.4	31	63-134%
Ethylbenzene	< 0.50	20.0	15.5	77.5	13.4	67.0	14.5	38	59.3-137%
Xylenes (Total)	< 0.50	60.0	49.9	83.0	43.0	71.5	14.9	31	59.3-144%

Notes:

Chevron U.S.A. Inc.  
P.O. BOX 5004  
San Ramon, CA 94583  
FAX (415)842-9591

Chevron Facility Number 9-0076  
Facility Address 4265 Foothill, Oakland  
Consultant Project Number 020104102  
Consultant Name GROUNDWATER TECHNOLOGY  
Address 4057 PORT CHICAGO HWY CONCORD, CA  
Project Contact (Name) KEN JOHNSON  
(Phone) 671-2387 (Fax Number)

Chevron Contact (Name) Mark Miller  
(Phone) (510) 842-8134  
Laboratory Name GTEL  
Laboratory Release Number 876-6690  
Samples Collected by (Name) Kevin D. Peterson  
Collection Date 9/22/94  
Signature Kevin D. Peterson

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water C = Charcoal	Type C = Grab C = Composites D = Discrete	Time	Sample Preservation	Lead (Yes or No)	Analysis To Be Performed														
								BTX + TPH GAS (8020 + 8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (9010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)							
C5	01	3	W	C	1310	HCl	Y	X														
C8	02	3			1350																	
C3	03	3			1400																	
C1	04	3			1410																	
C6	05	3			1420																	
C7	06	3			1430																	
C4	07	3			1440																	
C2	08	3			1450																	
TBLB	09	2	↓	↓	-	↓	↓	↓														

NOTE:  
Do Not Bill  
TB-LB SAMPLE  
5°  
Remarks

C4090400

Relinquished By (Signature) <u>Kevin D. Peterson</u>	Organization <u>G-TI</u>	Date/Time <u>9/22/94</u>	Received By (Signature) <u>[Signature]</u>	Organization <u>G-TI</u>	Date/Time <u>1450</u> <u>9/22/94</u>	Turn Around Time (Circle Choice) 24 Hrs. 48 Hrs. 6 Days 10 Days As Contracted
Relinquished By (Signature) <u>[Signature]</u>	Organization <u>G-TI</u>	Date/Time <u>1157</u> <u>9/24/94</u>	Received By (Signature) <u>John Weber</u>	Organization <u>GTEL</u>	Date/Time <u>1455</u> <u>9/26/94</u>	
Relinquished By (Signature) <u>John Weber</u>	Organization <u>GTEL</u>	Date/Time <u>5:15</u> <u>9/26/94</u>	Received For Laboratory By (Signature) <u>K. W. Motomeler</u>		Date/Time <u>5:15</u> <u>9-26-94</u>	