

**Weiss Associates***Environmental and Geologic Services*

5500 Shellmound Street, Emeryville, CA 94808-2411

Fax: 510-547-5043 Phone: 510-450-6000

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TO: Juliet Shin**FAX PHONE:** 569-4757**COMPANY:** ACDEH**BUSINESS PHONE:** 271-4320**DATE:** May 6, 1994**FROM:** David Elias**PROJECT #:** 81-429-104**SUBJECT:** 2160 Otis, Alameda**# OF PAGES:** 13
(including this cover) **Hard copy to follow if checked****COMMENTS & ACTIONS REQUIRED:**

Juliet, Please find attached a response to your March 24, 1994 letter. Please call me at 450-6108 at your earliest convenience to discuss the letter. Thanks!

Please call _____ at (510) 547-5420 if you do not receive all pages.



ALCO
FAX
94 MAY 10 PM 1:40

May 6, 1994

Juliet Shin
Alameda County Department of
Environmental Health
80 Swan Way, Room 210
Oakland, CA 94621

Re: Shell Service Station
2160 Otis Drive
Alameda, California
WIC #204-0072-0502
STID 590
WA Job #81-429-104

Dear Ms. Shin:

This letter responds to your March 24, 1994 letter to Dan Kirk of Shell Oil Company regarding an additional offsite investigation at the site referenced above (Figure 1). In your letter you recommended drilling offsite borings and collecting "grab" ground water samples to assess the source of the low volatile organic compounds (VOCs) concentrations detected in monitoring well MW-2 (Figure 2). WA agrees that additional investigation is necessary, but recommends an alternative scope of work. We are planning to use the results of our proposed scope of work to prepare a risk based corrective action plan in the future. Our objective is to base future remedial decisions on immediate human health risk and whether a sensitive receptor could be impacted in the future. Our rationale is presented below.

The only known possible onsite source area for the VOCs detected in MW-2 is the former waste oil tank located adjacent to monitoring well S-1 (Figure 2). If this waste oil tank were the source, and VOCs had migrated 150 ft from the waste oil tank to MW-2, we would expect to detect VOCs in ground water samples collected from monitoring well S-1 and soil borings BH-C, BH-D and BH-E. No VOCs have been detected in monitoring well S-1 since 1987, and no VOCs were detected in "grab" ground water samples collected from the soil borings, which suggests that there is an offsite source (Table 2b).

Since the VOC concentrations detected in ground water samples collected from MW-2 may not warrant an extensive additional investigation, we recommend assessing the risk associated with the VOC concentrations in ground water, rather than reverifying the offsite source at this time.

In previous telephone conversations we discussed conducting a risk assessment to assess the value of continued investigation and monitoring at the site. We propose implementing this plan by completing the following preliminary tasks. We plan to include the analytic results collected in this investigation in a risk based corrective action plan to be submitted in the future.

The components of this investigation will include:

- Sampling the wells for dissolved oxygen to assess biodegradation effectiveness;
- Sampling well MW-1 for VOCs to evaluate whether VOCs are migrating onsite from the southwest;
- Sampling the wells for total dissolved solids to assess the water quality; and
- Preparing a simple transport calculation to assess the risk of impacting the nearest downgradient receptor.

Juliet Shin
May 6, 1994


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The implementation of this preliminary scope of work should demonstrate the actual risk to human health and water supply quality associated with the VOC concentrations in ground water, and should guide any future investigation or remediation at this site.

Please call me at 450-6108 if you have any questions or comments.

Sincerely,
Weiss Associates



David Elias
Senior Staff Geologist

DCE:de

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cc: Dan Kirk, Shell Oil Company

Tom Callaghan, Regional Water Quality Control Board - San Francisco Bay Region

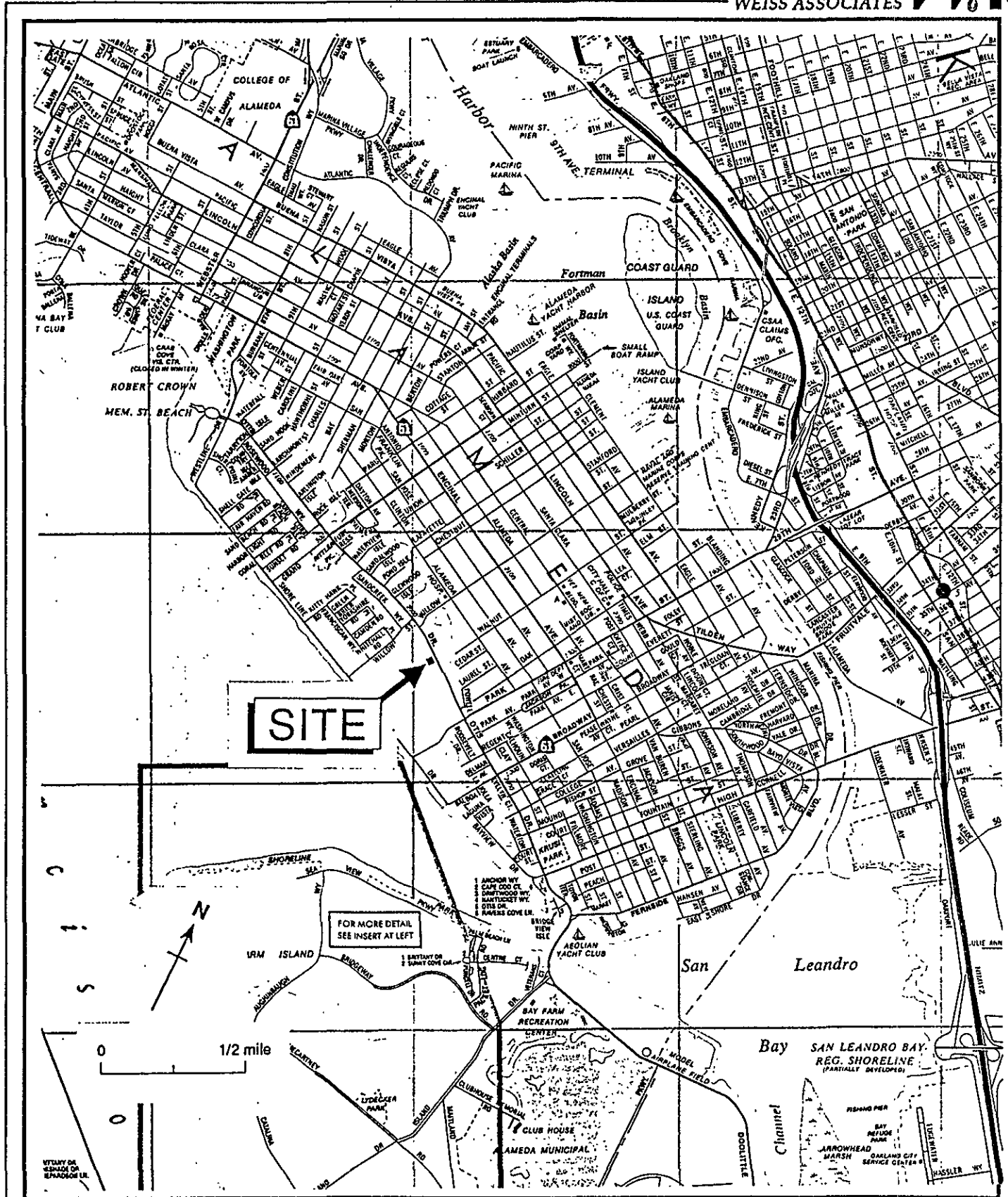


Figure 1. Site Location Map - Shell Service Station, WIC# 204-0072-0502, 2160 Otis Drive, Alameda, CA

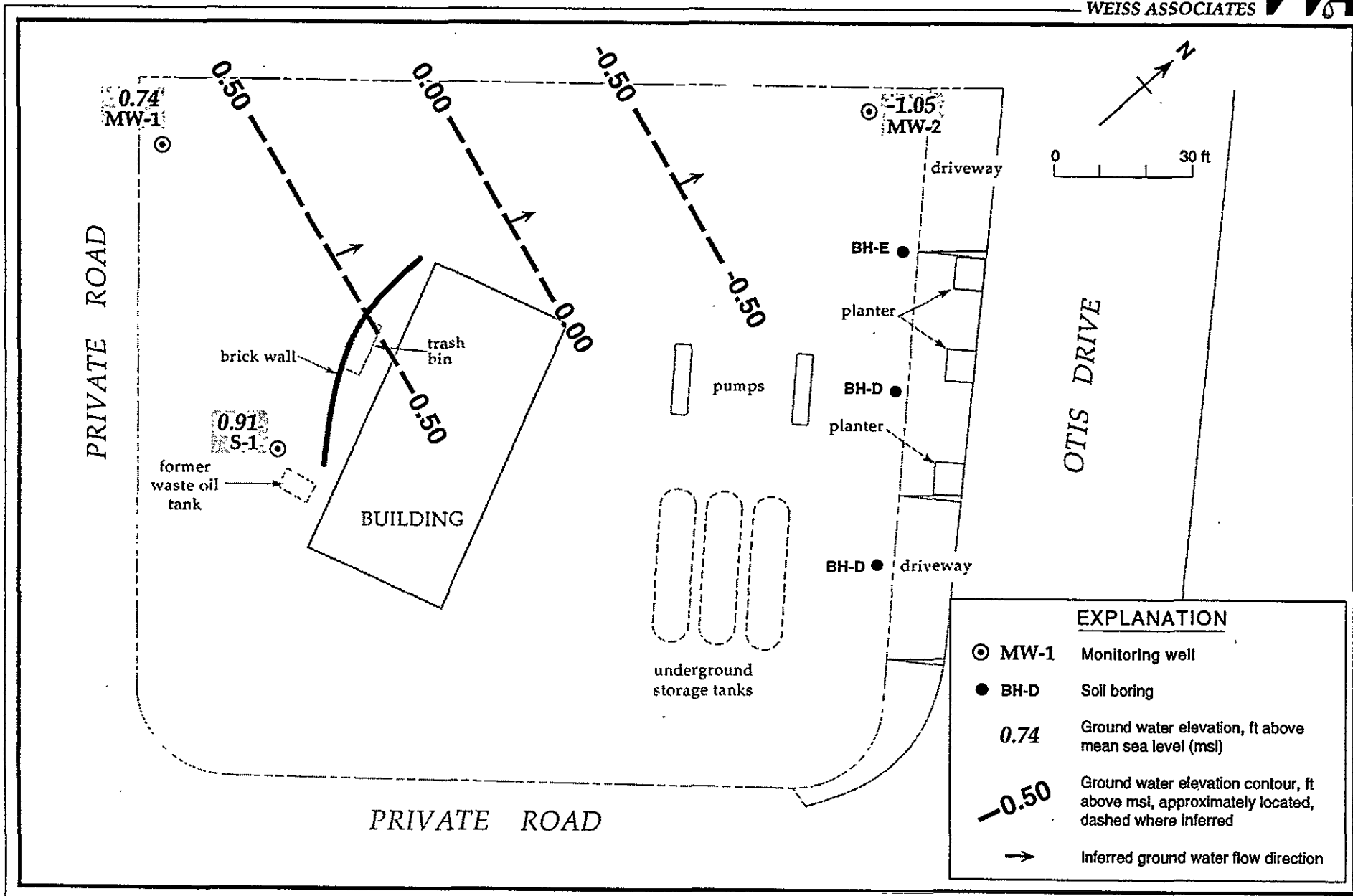


Figure 2. Monitoring Well Locations, Soil Boring Locations and Ground Water Elevation Contours - January 7, 1994 - Shell Service Station
WIC #204-0072-2160, 2160 Otis Drive, Alameda, California



Table 1. Ground Water Elevations - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	10/02/92		4.80	0.30
	01/05/93		5.38	-0.28
	04/08/93		3.69	1.41
	07/20/93		4.20	0.90
	10/15/93		4.38	0.72
	01/07/94		4.19	0.91



Table 1. Ground Water Elevations - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
MW-1	04/11/90	6.00	5.23	0.77
	07/10/90		5.40	0.60
	10/09/90		5.61	0.39
	01/17/91		5.66	0.34
	04/09/91		4.96	1.04
	07/10/91		5.52	0.48
	10/09/91		5.70	0.30
	01/24/92		5.51	0.49
	04/23/92		5.14	0.86
	07/01/92		4.48	1.52
	10/02/92		5.80	0.20
	01/05/93		5.34	0.66
	04/08/93		4.62	1.38
	07/20/93		5.20	0.80
	10/15/93		4.37	1.63
	01/07/94		5.26	0.74
MW-2	04/11/90	3.29	4.51	-1.22
	07/10/90		4.61	-1.32
	10/09/90		4.74	-1.45
	01/17/91		4.73	-1.44
	04/09/91		4.09	-0.80
	07/10/91		4.66	-1.37
	10/09/91		4.81	-1.52
	01/24/92		4.66	-1.37
	04/23/92		4.51	-1.22
	07/01/92		4.57	-1.28
	10/02/92		4.80	-1.51
	01/05/93		4.39	-1.1
	04/08/93		4.15	-0.86
	07/20/93		4.40	-1.11
	10/15/93		5.41	-2.12
	01/07/94		4.34	-1.05
S-1	09/11/90	5.10	4.29	0.81
	04/11/90		4.00	1.10
	07/10/90		4.25	0.85
	10/09/90		4.46	0.64
	01/17/91		4.53	0.57
	04/09/91		4.20	0.90
	07/10/91		4.42	0.68
	10/09/91		4.87	0.23
	01/24/92		4.90	0.20
	04/23/92		4.66	0.44
	07/01/92		4.85	0.25

Table 2A. Analytic Results for Ground Water - Petroleum Hydrocarbons - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X	POG	-----parts per billion (µg/L)----->	
S-1 (Annually 1st Qtr)	09/04/87		---	---	<5	<5	<5	<5	---		
	09/11/89 ^a	4.29	<50	<100	<0.5	<1	<1	<3	<1,000		
	04/11/90	4.00	<50	<50	<0.5	<0.5	<0.5	<0.5	<10,000		
	07/10/90	4.25	<90	---	<0.5	<0.5	<0.5	<0.5	<10,000		
	10/09/90	4.46	<50	---	<0.5	<0.5	<0.5	<0.5	<5,000		
	01/17/91	4.53	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	04/09/91	4.20	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	07/10/91	4.42	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	10/09/91	4.87	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	01/24/92	4.90	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	04/23/92	4.66	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	07/01/92	4.85	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	10/02/92	5.80	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	01/05/93	5.38	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	01/07/94	4.19	<50	---	<0.5	<0.5	<0.5	<0.5	---		
01/07/94	4.19	<50	---	<0.5	<0.5	<0.5	<0.5	---			
MW-1 (Annually 1st Qtr)	04/11/90	5.23	<50	<50	<0.5	<0.5	<0.5	<0.5	<10,000		
	07/10/90	5.40	100	---	<0.5	<0.5	<0.5	<0.5	<10,000		
	10/09/90	5.61	<50	---	<0.5	<0.5	<0.5	<0.5	<5,000		
	01/17/91	5.66	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	04/09/91	4.96	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	07/10/91	5.52	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	10/09/91	5.70	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	01/24/92	5.51	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	04/23/92	5.14	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	07/01/92	4.48	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	10/02/92	4.80	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	01/05/93	5.34	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	01/05/93 ^{dup}	5.34	<50	---	<0.5	<0.5	<0.5	<0.5	---		
	01/07/94	5.26	<50	---	<0.5	<0.5	<0.5	<0.5	---		
MW-2 (Quarterly)	04/11/90	4.51	200 ^b	220	2.7	<0.5	0.5	2.4	<10,000		
	07/10/90	4.61	570 ^b	450	150	<0.5	0.9	3.1	<10,000		
	10/09/90	4.74	190 ^b	51	55	<0.5	<0.5	<0.5	<5,000		
	01/17/91	4.73	350 ^b	<50	51	<0.5	<0.5	<0.5	---		
	04/09/91	4.09	---	<50	21	<5	<5	<5	---		
	07/10/91	4.66	50 ^b	<50	8.4	<0.5	<0.5	<0.5	---		
	10/09/91	4.81	150	---	22	<0.5	<0.5	<0.5	---		
	01/24/92	4.66	<50	---	4.8	<0.5	<0.5	<0.5	---		
	04/23/92	4.51	<50	---	2.3	1.5	<0.5	<0.5	---		
	07/01/92	4.57	130 ^c	---	19	<0.5	<0.5	<0.5	---		
	10/02/92	4.80	120 ^c	---	7.8	<0.5	<0.5	<0.8	---		
	01/05/93	4.39	200 ^c	---	9.0	<0.5	0.6	1.8	---		
	04/08/93	4.15	170 ^c	---	9.6	<0.5	<0.5	1.6	---		

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-- Table 2A continues on next page --

Table 2A. Analytic Results for Ground Water - Petroleum Hydrocarbons - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California (continued)

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X	POG
	07/20/93	4.40	80 ^d	---	16	1.3	1.4	6.1	---
	10/15/93	4.38	400 ^c	---	37	0.6	1.1	4.7	---
	01/07/94	4.34	86 ^d	---	12	<0.5	<0.5	1.1	<500
BH-C	12/17/92	5.0	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---
BH-D	12/17/92	5.0	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---
BH-E	12/17/92	5.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---
Trip Blank	07/10/90		<50	---	<0.5	<0.5	<0.5	<0.5	---
	10/09/90		<50	---	<0.5	<0.5	<0.5	<0.5	---
	01/17/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	04/09/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	07/10/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	10/09/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	01/24/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	04/23/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	07/01/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	10/02/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	01/05/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
	04/08/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
	07/20/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
	10/15/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
01/07/94		<50	---	<0.5	<0.5	<0.5	<0.5	---	

DTSC MCLs

-- Table 2A continues on next page --



Table 2A. Analytic Results for Ground Water - Petroleum Hydrocarbons - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California
(continued)

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015
TPH-D = Total petroleum hydrocarbons as diesel by Modified EPA Method 8015
B = Benzene by EPA Method 8020, or 8240
E = Ethylbenzene by EPA Method 8020, or 8240
T = Toluene by EPA Method 8020, or 8240
X = Xylenes by EPA Method 8020, or 8240
POG = Petroleum oil and grease by American Public Health Association Standard Methods 503, or EPA method 5520 BF
DTSC MCLs = Department of Toxic Substances Control maximum contaminant levels
<n = Not detected above detection limit of n ppb
NE = DTSC MCL not established
BH-C = Grab Ground Water Sample

Notes:

a = 0.090 ppm chromium, 0.090 ppm lead and 0.10 ppm Zn detected; no cadmium detected above detection limit of 0.010 ppm by EPA Method 6010. No semi-volatile organic compounds or PCBs detected by EPA Method 625. DHS MCLs for Cr = 0.05 ppm; Pb = 0.05 ppm; secondary MCL for Zn = 5 ppm.
b = Chromatographic pattern not typical for gasoline; the concentration is due mostly to lighter hydrocarbon compounds.
c = The concentration reported as gasoline is *partially* due to the presence of discrete peaks not indicative of gasoline.
d = The concentration reported as gasoline is *primarily* due to the presence of discrete peaks not indicative of gasoline.
e = DTSC recommended action level for drinking water; MCL not established

Table 2B. Analytic Results for Ground Water - Volatile Organic Compounds - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California

Well ID	Date Sampled	Depth to Water (ft)	TCE	TCA	PCE	Chloroform	cis-1,2-DCE	trans-1,2-DCE	1,2-DCA	Carbon Disulfate	Vinyl Chloride
S-1	09/04/87 ^a	---	---	---	---	---	---	---	---	---	---
	09/11/89	4.29	ND	ND	ND	ND	ND	ND	ND	ND	ND
	04/11/90	4.00	<0.4	<0.4	<0.4	1.7	<0.4	<0.4	<0.4	---	<0.4
	07/10/90	9.25	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	<2
	10/09/90	4.96	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	<2
	01/07/94	4.19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	<0.5
	01/07/94 ^{dup}	4.19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	<0.5
MW-1	04/11/90	5.23	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	<0.4
	07/10/90	5.40	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	<2
	10/09/90	5.61	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	<2
	01/07/94	5.26	---	---	---	---	---	---	---	---	---
MW-2	04/11/90	4.51	1.2	<0.4	<0.4	4.5	<0.4	16	<0.4	---	<2
	07/10/90	4.61	0.93	<0.4	<0.4	1.7	<0.4	11	0.44	---	<2
	10/09/90	4.74	1.3	<0.5	1.6	15	46	6.7	<0.5	---	2.5
	01/17/91 ^b	4.73	1.2	<0.5	0.6	2.6	74	12	0.5	---	3.0
	04/09/91	4.09	<5	<5	<5	<5	64	<5	<5	<0.5	<10
	07/10/91	4.66	<0.5	<0.5	6.9	43	<0.5	<0.5	<0.5	14	<10
	10/09/91	4.81	1.9	<1	28	7.4	54	16	<1	---	1.7
	01/24/92	4.66	2.5	<0.5	7.0	19	16	4.3	0.6	---	<0.5
	04/23/92	4.51	<3	<3	3.0	<3	84	18	<3	---	<3
	07/01/92	4.57	2.0	<1	2.0	<1	54	14	<1	---	1.0
	10/92/92	4.80	1.0	<1	<1	<1	61	12	<1	---	<1
	01/05/93	4.39	1.7	<0.5	2.2	<0.5	33	8.7	<0.5	---	.67
	04/08/93	4.15	1.3	<1	<1	<1	38	7.8	<1	---	<1
	07/20/93	4.40	2.4	<1	4.7	2.3	43	10	<0.5	---	<0.5
	10/15/93	4.38	<2.5	<2.5	<2.5	<2.5	110	25	<2.5	---	<2.5
	01/07/94	4.34	3.8	<0.5	14.0	8.9	29	5.4	<0.5	---	<0.5
BH-C	12/17/93	5.0	<2	<2	<2	<2	<2	<2	<2	---	<2
BH-D	12/17/93	5.0	<2	<2	<2	<2	<2	<2	<2	---	<2
BH-E	12/17/93	5.5	<2	<2	<2	<2	<2	<2	<2	---	<2
DTSC MCLs			5	200	5	NE	6	10	0.5	NE	0.5

-- Table 2B continues on next page --



Table 2B. Analytic Results for Ground Water - Volatile Organic Compounds - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California
(continued)

Abbreviations:

TCE = Trichloroethene by EPA Method 601/8010 or 8240
TCA = 1,1,1-Trichloroethane by EPA Method 601/8010 or 8240
Tetrachloroethene by EPA Method 601/8010 or 8240
cis-1,2-DCE = cis-1,2-Dichloroethene by EPA Method 601/8010 or 8240
trans-1,2-DCE = trans-1,2-Dichloroethene by EPA Method 601/8010 or 8240
--- = Not analyzed
<n = Not detected above detection limit of n ppb
1,2-DCA = 1,2 dichloroethane by EPA Method 601/8010 or 8240

DTCS MCLs = Department of Toxic Substance control maximum contaminant levels

NE = DTSC MCL not established

ND = Analyte not detected, detection limit not known

Notes:

a = 7.0 ppb unknown alcohol and 270 ppb acetone detected

b = 5.0 ppb chlorobenzene detected

Juliet Shin
May 6, 1994

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Since the VOC concentrations detected in ground water samples collected from MW-2 may not warrant an extensive additional investigation, we recommend assessing the risk associated with the VOC concentrations in ground water, rather than reverifying the offsite source at this time.

In previous telephone conversations we discussed conducting a risk assessment to assess the value of continued investigation and monitoring at the site. We propose implementing this plan by completing the following preliminary tasks. We plan to include the analytic results collected in this investigation in a risk based corrective action plan to be submitted in the future.

The components of this investigation will include:

- Sampling the wells for dissolved oxygen to assess biodegradation effectiveness;
- Sampling well MW-1 for VOCs to evaluate whether VOCs are migrating onsite from the southwest;
- Sampling the wells for total dissolved solids to assess the water quality; and
- Preparing a simple transport calculation to assess the risk of impacting the nearest downgradient receptor.

05/06/1994 16:34 5183473843
Juliet Shin
May 6, 1994

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The implementation of this preliminary scope of work should demonstrate the actual risk to human health and water supply quality associated with the VOC concentrations in ground water, and should guide any future investigation or remediation at this site.

Please call me at 450-6108 if you have any questions or comments.

Sincerely,
Weiss Associates



David Elias
Senior Staff Geologist

DCE:de

J:\HC_ENG\SHELLAALA-OTIS\429LIMY4.WP

cc: Dan Kirk, Shell Oil Company

Tom Callaghan, Regional Water Quality Control Board - San Francisco Bay Region

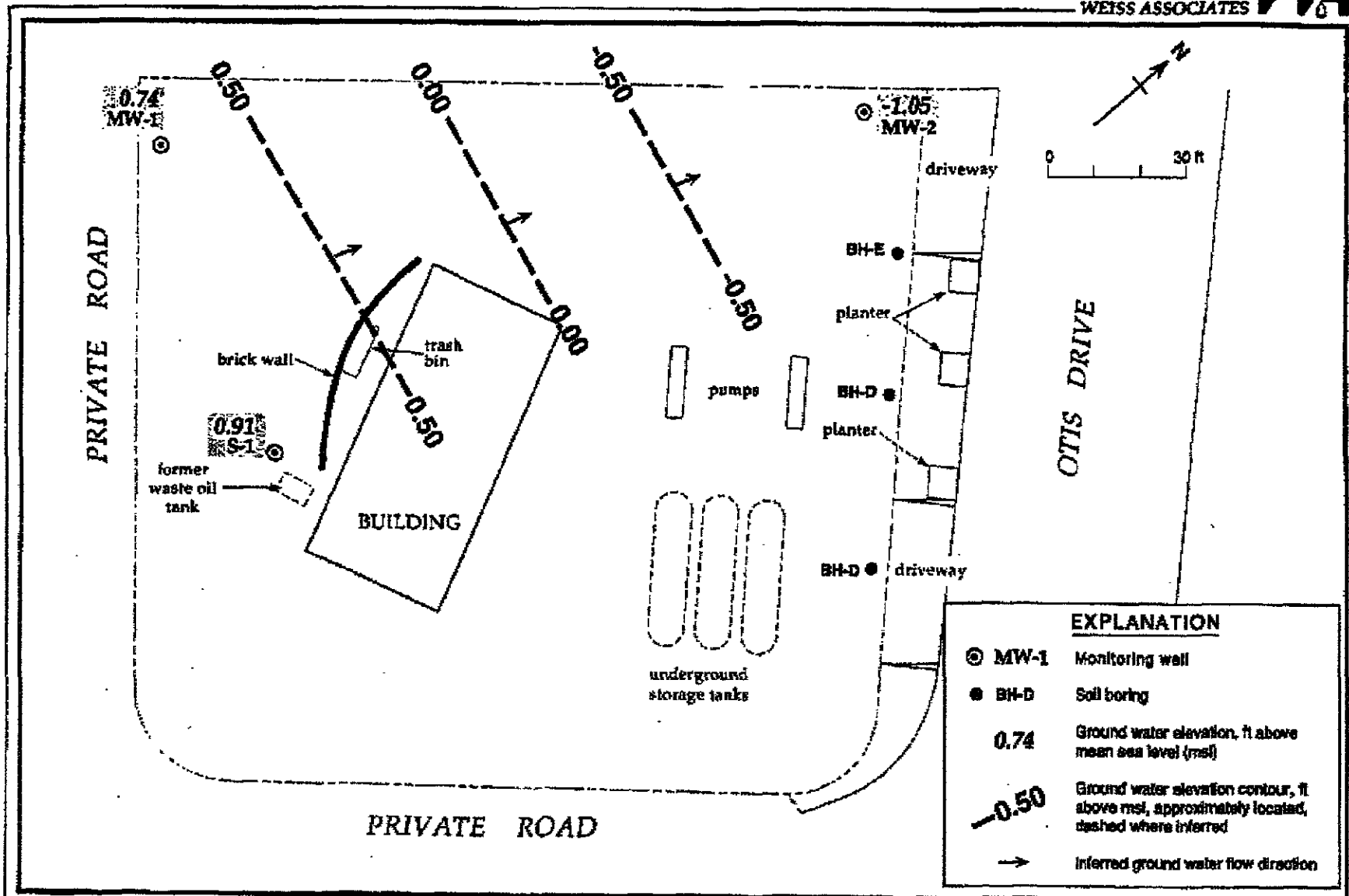


Figure 2. Monitoring Well Locations, Soil Boring Locations and Ground Water Elevation Contours - January 7, 1994 - Shell Service Station
WIC #204-0072-2160, 2160 Otis Drive, Alameda, California



Table 1. Ground Water Elevations - Shell Service Station WIC #204-0072-0502, 2180 Otis Drive, Alameda, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
MW-1	04/11/90	6.00	5.23	0.77
	07/10/90		5.40	0.60
	10/09/90		5.61	0.39
	01/17/91		5.66	0.34
	04/09/91		4.96	1.04
	07/10/91		5.52	0.48
	10/09/91		5.70	0.30
	01/24/92		5.51	0.49
	04/23/92		5.14	0.86
	07/01/92		4.48	1.52
	10/02/92		5.80	0.20
	01/05/93		5.34	0.66
	04/08/93		4.62	1.38
	07/20/93		5.20	0.80
	10/15/93		4.37	1.63
	01/07/94		5.26	0.74
MW-2	04/11/90	3.29	4.51	-1.22
	07/10/90		4.61	-1.32
	10/09/90		4.74	-1.45
	01/17/91		4.73	-1.44
	04/09/91		4.09	-0.80
	07/10/91		4.66	-1.37
	10/09/91		4.81	-1.52
	01/24/92		4.66	-1.37
	04/23/92		4.51	-1.22
	07/01/92		4.57	-1.28
	10/02/92		4.80	-1.51
	01/05/93		4.39	-1.1
	04/08/93		4.15	-0.86
	07/20/93		4.40	-1.11
	10/15/93		5.41	-2.12
	01/07/94		4.34	-1.05
S-1	09/11/90	5.10	4.29	0.81
	04/11/90		4.00	1.10
	07/10/90		4.25	0.85
	10/09/90		4.46	0.64
	01/17/91		4.53	0.57
	04/09/91		4.20	0.90
	07/10/91		4.42	0.68
	10/09/91		4.87	0.23
	01/24/92		4.90	0.20
	04/23/92		4.66	0.44
	07/01/92		4.85	0.25



Table 1. Ground Water Elevations - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	10/02/92		4.80	0.30
	01/05/93		5.38	-0.28
	04/08/93		3.69	1.41
	07/20/93		4.20	0.90
	10/15/93		4.38	0.72
	01/07/94		4.19	0.91

Table 2A. Analytic Results for Ground Water - Petroleum Hydrocarbons - Shell Service Station WIC #204-0072-0502, 2160 Oris Drive, Alameda, California

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B E T X					POG
					-----parts per billion (µg/L)-----					
S-1 (Annually 1st Qtr)	09/04/87		---	---	<5	<5	<5	<5	---	
	09/11/89 ^a	4.29	<50	<100	<0.5	<1	<1	<5	<1,000	
	04/11/90	4.00	<50	<50	<0.5	<0.5	<0.5	<0.5	<10,000	
	07/10/90	4.25	<90	---	<0.5	<0.5	<0.5	<0.5	<10,000	
	10/09/90	4.46	<50	---	<0.5	<0.5	<0.5	<0.5	<5,000	
	01/17/91	4.33	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	04/09/91	4.20	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	07/10/91	4.42	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	10/09/91	4.87	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	01/24/92	4.90	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	04/23/92	4.66	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	07/01/92	4.85	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	10/02/92	5.80	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	01/05/93	5.38	<50	---	<0.5	<0.5	<0.5	<0.5	---	
01/07/94	4.19	<50	---	<0.5	<0.5	<0.5	<0.5	---		
01/07/94	4.19	<50	---	<0.5	<0.5	<0.5	<0.5	---		
Mw-1 (Annually 1st Qtr)	04/11/90	5.23	<50	<50	<0.5	<0.5	<0.5	<0.5	<10,000	
	07/10/90	5.40	100	---	<0.5	<0.5	<0.5	<0.5	<10,000	
	10/09/90	5.61	<50	---	<0.5	<0.5	<0.5	<0.5	<5,000	
	01/17/91	5.66	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	04/09/91	4.96	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	07/10/91	5.52	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	10/09/91	5.70	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	01/24/92	5.51	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	04/23/92	5.14	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	07/01/92	4.48	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	10/02/92	4.80	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	01/05/93	5.34	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	01/05/93 ^{sup}	5.34	<50	---	<0.5	<0.5	<0.5	<0.5	---	
	01/07/94	5.26	<50	---	<0.5	<0.5	<0.5	<0.5	---	
Mw-2 (Quarterly)	04/11/90	4.51	200 ^b	220	2.7	<0.5	0.5	2.4	<10,000	
	07/10/90	4.61	570 ^b	650	150	<0.5	0.9	3.1	<10,000	
	10/09/90	4.74	190 ^b	51	55	<0.5	<0.5	<0.5	<5,000	
	01/17/91	4.73	350 ^b	<50	51	<0.5	<0.5	<0.5	---	
	04/09/91	4.09	---	<50	21	<5	<5	<5	---	
	07/10/91	4.66	50 ^b	<50	8.4	<0.5	<0.5	<0.5	---	
	10/09/91	4.81	150	---	22	<0.5	<0.5	<0.5	---	
	01/24/92	4.66	<50	---	6.8	<0.5	<0.5	<0.5	---	
	04/23/92	4.51	<50	---	2.3	1.5	<0.5	<0.5	---	
	07/01/92	4.57	130 ^c	---	19	<0.5	<0.5	<0.5	---	
	10/02/92	4.80	120 ^c	---	7.8	<0.5	<0.5	<0.8	---	
	01/05/93	4.39	200 ^c	---	9.0	<0.5	0.6	1.8	---	
	04/08/93	4.15	170 ^c	---	9.6	<0.5	<0.5	1.6	---	

Wells Associates



-- Table 2A continues on next page --

Table 2A. Analytic Results for Ground Water - Petroleum Hydrocarbons - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California (continued)

Well ID (Sampling Frequency)	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X	POG
	07/20/93	4.40	80 ^d	---	16	1.3	1.4	6.1	---
	10/15/93	4.38	400 ^c	---	37	0.6	1.1	4.7	---
	01/07/94	4.34	86 ^d	---	12	<0.5	<0.5	1.1	<500
BH-C	12/17/92	5.0	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---
BH-D	12/17/92	5.0	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---
BH-E	12/17/92	5.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	---
Trip	07/10/90		<50	---	<0.5	<0.5	<0.5	<0.5	---
Blank	10/09/90		<50	---	<0.5	<0.5	<0.5	<0.5	---
	01/17/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	04/09/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	07/10/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	10/09/91		<50	---	<0.5	<0.5	<0.5	<0.5	---
	01/24/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	04/25/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	07/01/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	10/02/92		<50	---	<0.5	<0.5	<0.5	<0.5	---
	01/03/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
	04/08/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
	07/20/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
	10/15/93		<50	---	<0.5	<0.5	<0.5	<0.5	---
	01/07/94		<50	---	<0.5	<0.5	<0.5	<0.5	---

DTSC MCLs

-- Table 2A continues on next page --



Table 2A. Analytic Results for Ground Water - Petroleum Hydrocarbons - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California
(continued)

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015

TPH-D = Total petroleum hydrocarbons as diesel by Modified EPA Method 8015

B = Benzene by EPA Method 8020, or 8240

E = Ethylbenzene by EPA Method 8020, or 8240

T = Toluene by EPA Method 8020, or 8240

X = Xylenes by EPA Method 8020, or 8240

POG = Petroleum oil and grease by American Public Health Association Standard Methods 503, or EPA method 5520 BF

DTSC MCLs = Department of Toxic Substances Control maximum contaminant levels

<n = Not detected above detection limit of n ppb

NE = DTSC MCL not established

BH-C = Grab Ground Water Sample

Notes:

a = 0.090 ppm chromium, 0.090 ppm lead and 0.10 ppm Zn detected; no cadmium detected above detection limit of 0.010 ppm by EPA Method 6010. No semi-volatile organic compounds or PCBs detected by EPA Method 625. DHS MCLs for Cr = 0.05 ppm; Pb = 0.05 ppm; secondary MCL for Zn = 5 ppm.

b = Chromatographic pattern not typical for gasoline; the concentration is due mostly to lighter hydrocarbon compounds.

c = The concentration reported as gasoline is *partially* due to the presence of discrete peaks not indicative of gasoline.

d = The concentration reported as gasoline is *primarily* due to the presence of discrete peaks not indicative of gasoline.

e = DTSC recommended action level for drinking water; MCL not established

Table 23. Analytic Results for Ground Water - Volatile Organic Compounds - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California

Well ID	Date Sampled	Depth to Water (ft)	TCE	TCA	PCE	Chloroform	parts per billion (µg/L)				Carbon Disulfate	Vinyl Chloride
							cis-1,2-DCE	trans-1,2-DCE	1,2-DCA			
S-1	09/04/87 ^a	---	---	---	---	---	---	---	---	---	---	---
	09/11/89	4.29	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	04/11/90	4.00	<0.4	<0.4	<0.4	1.7	<0.4	<0.4	<0.4	ND	ND	<0.4
	07/10/90	9.25	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4
	10/09/90	4.96	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5
	01/07/94	4.19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5
	01/07/94 ^b	4.19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5
NW-1	04/11/90	5.23	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4
	07/10/90	5.40	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	---	---	<0.4
	10/09/90	5.61	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	---	---	<0.5
	01/07/94	5.28	---	---	---	---	---	---	---	---	---	---
NW-2	04/11/90	4.51	1.2	<0.4	<0.4	4.5	<0.4	16	<0.4	---	---	<0.4
	07/10/90	4.61	0.93	<0.4	<0.4	1.7	<0.4	11	0.44	---	---	<0.4
	10/09/90	4.74	1.3	<0.5	1.6	15	46	6.7	<0.5	---	---	2.5
	01/17/91 ^b	4.73	1.2	<0.5	0.6	2.6	74	12	0.5	---	---	3.0
	04/09/91	4.09	<5	<5	<5	<5	64	6	<5	4.5	---	<10
	07/10/91	4.66	<0.5	<0.5	6.9	43	<0.5	<0.5	<0.5	14	---	<10
	10/09/91	4.81	1.9	<1	28	7.4	54	16	<1	---	---	1.7
	01/24/92	4.66	2.5	<0.5	7.0	19	16	4.3	0.6	---	---	<0.5
	04/23/92	4.51	<3	<3	3.0	<3	84	18	<3	---	---	<3
	07/01/92	4.57	2.0	<1	2.0	<1	54	14	<1	---	---	1.0
	10/02/92	4.80	1.0	<1	<1	<1	61	12	<1	---	---	<1
	01/05/93	4.39	1.7	<0.5	2.2	<0.5	33	8.7	<0.5	---	---	1.67
	04/08/93	4.15	1.3	<1	<1	<1	38	7.8	<1	---	---	<1
	07/20/93	4.40	2.4	<1	4.7	2.3	43	10	<0.5	---	---	<0.5
	10/15/93	4.38	<2.5	<2.5	<2.5	<2.5	110	25	<2.5	---	---	<2.5
	01/07/94	4.34	<2.5	<2.5	<2.5	<2.5	89	24	<2.5	---	---	<2.5
BH-C	12/17/93	5.0	<2	<2	<2	<2	<2	<2	<2	---	---	<2
BH-D	12/17/93	5.0	<2	<2	<2	<2	<2	<2	<2	---	---	<2
BH-E	12/17/93	5.5	<2	<2	<2	<2	<2	<2	<2	---	---	<2
DTSC NCLs			5	200	5	NE	6	10	0.5	NE		0.5

-- Table 23 continues on next page --



Table 2B. Analytic Results for Ground Water - Volatile Organic Compounds - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California
(continued)

Abbreviations:

TCE = Trichloroethene by EPA Method 601/8010 or 8240
TCA = 1,1,1-Trichloroethane by EPA Method 601/8010 or 8240PCE =
Tetrachloroethene by EPA Method 601/8010 or 8240
cis-1,2-DCE = cis-1,2-Dichloroethene by EPA Method 601/8010 or 8240
trans-1,2-DCE = trans-1,2-Dichloroethene by EPA Method 601/8010 or 8240
--- = Not analyzed
<M = Not detected above detection limit of M ppb
1,2-DCA = 1,2 dichloroethane by EPA Method 601/8010 or 8240

DTCS MCLs = Department of Toxic Substance control maximum contaminant
levels

NE = DTSC MCL not established

ND = Analyte not detected, detection limit not known

Notes:

a = 7.0 ppb unknown alcohol and 270 ppb acetone detected

b = 5.0 ppb chlorobenzene detected