Weiss Associates

Environmental and Geologic Services

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December 7, 1993

Scott Seery
Alameda County Department of
Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Re: [redacted]
Shell Service Station
WIC #204-6852-1404
1784 150th Avenue
San Leandro, California
WA Job #81-422-60

Dear Mr. Seery:

As you requested in your October 26, 1993 letter to Dan Kirk of Shell Oil Company, Weiss Associates, on behalf of Shell Oil Company, is submitting this subsurface investigation workplan for the site referenced above (Figure 1). The investigation objectives are to assess the extent of hydrocarbons in ground water both upgradient and downgradient of the site. Presented below is a summary of the site history, our specific investigation objectives, our proposed scope of work and our work schedule.

SITE SUMMARY

1986 Waste Oil Tank Removal: In November 1986, Petroleum Engineering of Santa Rosa, California removed a 550-gallon waste oil tank and installed a new 550-gallon fiberglass tank in the former tank pit. Immediately following the tank removal, Blaine Tech Services (BTS) of San Jose, California collected a soil sample beneath the former tank location at 8 ft depth that contained 196 parts per million (ppm) petroleum oil and grease (POG).[1] BTS collected another soil sample at 11 ft depth while excavating the tank pit to a total depth of 16 ft. The

1 BTS, November 21, 1986, Sampling Report 86311-F4, Shell Service Station, 1784 150th Avenue, San Leandro, California, Consultant's letter-report prepared for Shell Oil Company, 3 pages and 2 attachments.

11 ft depth sample contained 167 ppm POG. BTS did not collect a soil sample from 16 ft depth. No ground water was encountered in the tank excavation.[2]

1990 Well Installation: In March 1990, WA installed ground water monitoring well MW-1 adjacent to the waste oil tank.[3] WA has sampled well MW-1 quarterly since March 1990.

1992 Subsurface Investigation: In April 1992, WA installed ground water monitoring wells MW-2 and MW-3 to assess water quality down- and upgradient of the existing underground fuel storage tanks, and to determine the ground water flow direction and gradient beneath the site.[4] These wells are also sampled quarterly.

Quarterly Ground Water Monitoring: Ground water beneath the site has been monitored quarterly since March 1990.[5] The water table has fluctuated between 17 and 30 ft depth in the three wells. Based on the ground water elevation data from these wells, the ground water flow direction has varied between northwestward to southward and remains relatively flat (about 0.001 ft/ft). Quarterly sampling analytic data is presented as Attachment A.

INVESTIGATION OBJECTIVES

Although the ground water gradient beneath the site appears to be relatively flat, the results of our previous subsurface investigations indicate that hydrocarbons in ground water may have migrated downgradient of the site. In addition, hydrocarbons are present in ground water upgradient of the former waste oil tank and the underground fuel storage tanks and may

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2 BTS, November 21, 1986, Sampling Report 86315-M2, Shell Service Station, 1784 150th Avenue, San Leandro, California, Consultant's letter-report prepared for Shell Oil Company, 3 pages and 2 attachments.

3 WA, July 31, 1990, Consultant's letter-report prepared for the Alameda County Department of Environmental Health (ACDEH) regarding second quarter 1990 activities at the Shell service station located at 1784 150th Avenue in San, Leandro, California, 10 pages and 2 attachments.

4 WA, April 27, 1992, Consultant's letter-report prepared for the Alameda County Department of Environmental Health (ACDEH) regarding a subsurface investigation at the Shell service station located at 1784 150th Avenue in San, Leandro, California, 6 pages and 4 attachments.

5 WA, October 15, 1993, Consultant's letter-report to Scott Seery of the Alameda County Department of Environmental Health regarding the third quarter 1993 ground water sampling at 1784 150th Avenue, San Leandro, California, 2 pages and 1 attachment.

originate upgradient of the Shell site. Therefore, our objective is to fully characterize the extent of hydrocarbons in ground water both upgradient and downgradient of the Shell site.

PROPOSED SCOPE OF WORK

Our proposed scope of work to achieve these objectives is described in detail below.

Permits: We will obtain permits from the City of San Leandro to drill on the public right-of-ways, and soil boring permits from the Alameda County Flood Control and Water Conservation District, Zone 7.

Soil Borings: We will drill eight small-diameter soil borings in the locations shown on Figure 2. We will collect water samples from each boring using a Hydropunch. After sampling, all borings will be grouted with neat Portland cement using a tremie pipe and capped with asphalt to match the existing surface materials.

Analytic Data Review: We will review the analytic data to assess the extent of hydrocarbons in ground water. Based on the results of the Hydropunch sampling, we will assess whether any additional investigation is warranted.

Waste Disposal: Soil cuttings will be sampled and stored on and covered by plastic sheeting and properly labeled, and disposed at an appropriate disposal facility based on sample results. Steam cleaning rinsate will be transported to the Shell refinery in Martinez, California for recycling.

Reporting: We will prepare a report presenting the results of the investigation. The report will include:

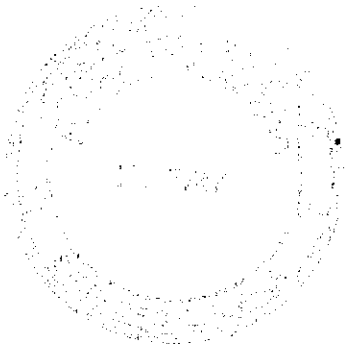
- A summary of the site background and history;
- Descriptions of the drilling and hydropunch sampling;
- Tabulated ground water analytic results;
- Analytic reports and chain-of-custody forms for the ground water samples;
- A figure presenting benzene distribution in ground water;

- Soil and water disposal documentation; and
- Conclusions.

SCHEDULE

WA will conduct this investigation after receiving your approval of this workplan and the necessary permits. We will submit a report presenting the results of the investigation after we complete all field work and compile the analytic data.

Please call us if you have any questions.



Sincerely,
Weiss Associates

Janet K. Macdonald
Senior Staff Hydrogeologist

N. Scott MacLeod, R.G.
Project Geologist

JKM/NSM:jm

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Attachments: Figures
A - Previous Analytic Data

cc: Dan Kirk, Shell Oil Company, P.O. Box 5278, Concord, California 94520-9998
Lester Feldman, Regional Water Quality Control Board - San Francisco Bay, 2101 Webster Street, Suite 500, Oakland, California 94612

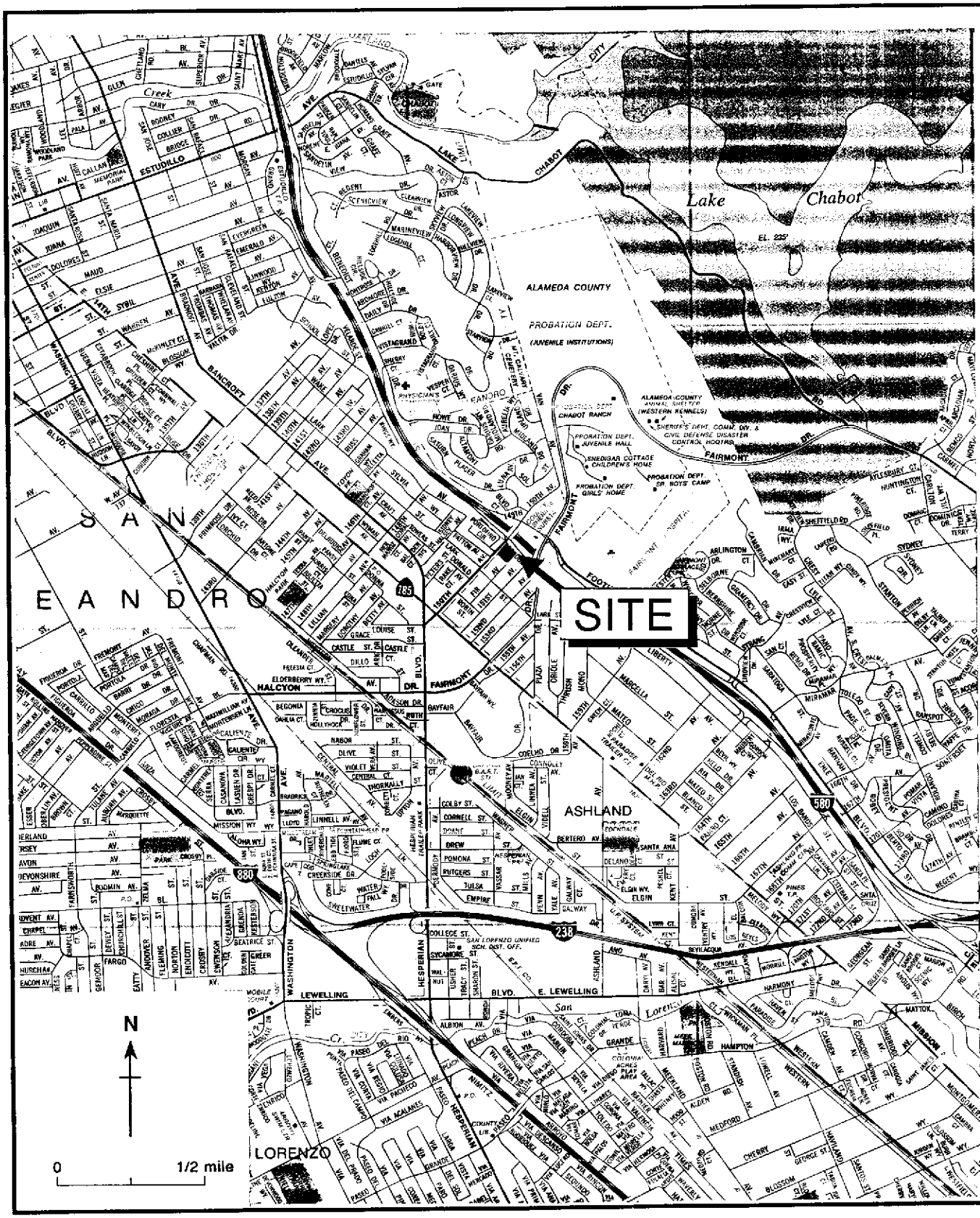

Figure 1. Site Location Map - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

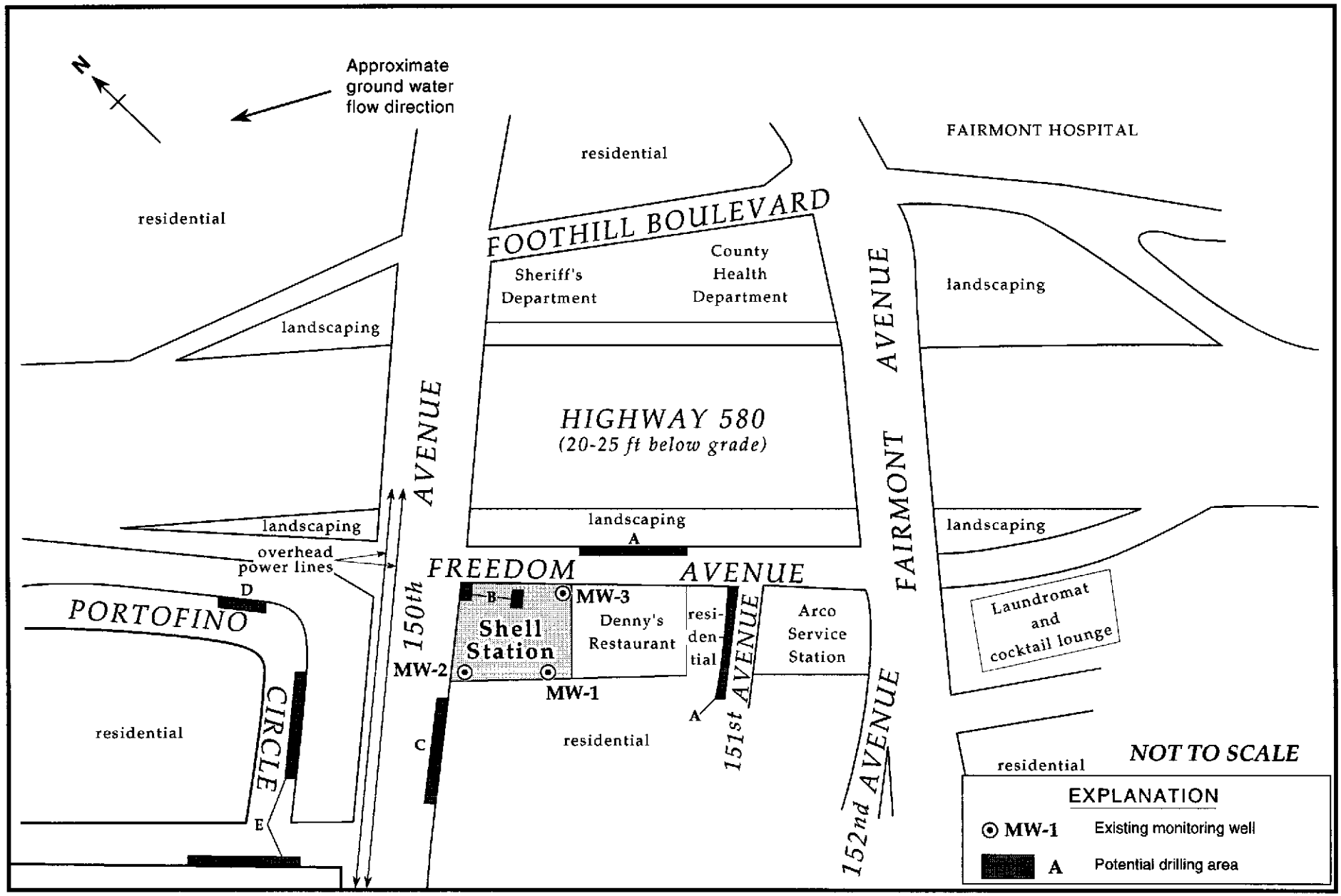

Figure 2. Planned Drilling Locations and Existing Monitoring Wells - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

ATTACHMENT A

PREVIOUS ANALYTIC DATA

Table 1. Analytic Results for Soil - Shell Service Station WIC #204-6852-1404, 1784 150th Avenue, San Leandro, California

Boring ID (Well ID)	Sample Depth (ft)	Date Sampled	Ground Water Depth (ft)	TPH-G	TPH-D	POG[a]	B	E	T	X	HVOCs
				<----------parts per million (mg/kg)---------->							
BH-A	5.0	03/05/90	34.1	<1	---	<100	<0.0025	<0.0025	<0.0025	<0.0025	b
(MW-1)	15.7			<1	---	<100	<0.0025	<0.0025	<0.0025	<0.0025	b
	24.7			<1	<1[c]	<100	0.020	<0.0025	<0.0025	<0.0025	b
	29.2			35	---	<100	0.23	0.20	<0.025	0.64	d
	41.2			<1	---	<100	<0.0025	<0.0025	<0.0025	<0.0025	b
BH-B	11.5	02/04/92	23.8	<1	---	---	0.0026	<0.0025	<0.0025	<0.0025	b
(MW-2)	16.5			<1	---	---	0.0058	<0.0025	<0.0025	<0.0025	---
	21.5			79	23[e]	---	0.20	0.60	1.0	4.1	b
	26.5			74	---	---	0.59	0.91	1.5	3.9	---
BH-C	11.5	02/05/92	28.8	<1	---	---	0.0042	0.0029	0.0039	<0.0025	b
(MW-3)	21.5			<1	---	---	<0.0025	<0.0025	<0.0025	<0.0025	b
	26.5			3.9	4.9[e]	---	<0.0025	<0.0025	<0.0025	0.0054	b
	31.5			68	---	---	<0.05	<0.05	<0.05	0.17	---

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
POG = Petroleum Oil and Grease by American Public Health Association (APHA) Standard Method 503E
B = Benzene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
T = Toluene by EPA Method 8020
X = Xylenes by EPA Method 8020
HVOCs = Halogenated volatile organic compounds by EPA Method 8010
--- = Not analyzed
<n = Not detected above method detection limit of n ppm

Analytical Laboratory:

National Environmental Testing (NET) Pacific, Inc., Santa Rosa, California

Notes:

a = No total oil and grease detected above APHA Standard Method 503D detection limit of 50 ppm in any soil samples from boring BH-A
b = No HVOCs detected
c = No total petroleum hydrocarbons as motor oil detected above Modified EPA Method 8015 detection limit of 10 ppm
d = 0.0064 ppm 1,2-dichloroethane detected
e = NET reported that detected compounds are hydrocarbons lighter than diesel

TABLE 2. Analytic Results for Ground Water - Shell Service Station WIC #204-6852-0703, 1784 150th Avenue, San Leandro, California

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	POG	B	E	T	X	1,2-DCA
			<----------parts per billion (ug/l)---------->							
MW-1	03/08/90	25.29	510	120[a]	<10,000	1.5	<0.5	0.8	5.4	12
	06/12/90	25.85	390	100[a]	<10,000	86	0.7	1.3	6.2	<0.4
	09/13/90	27.49	100	130[a]	<10,000	56	2.4	0.75	2.8	<0.4[b]
	12/18/90	27.41	480	<50[a]	<10,000	54	3.3	1.7	3.7	5.3
	03/07/91	25.79	80	<50[a]	---	266	1.2	<0.5	<1.5	6.7
	06/07/91	25.64	510	<50[a]	---	130	6.1	3.8	11	7.9
	09/17/91	27.54	330	120[ac]	---	67	3	<0.5	2.2	6
	12/09/91	27.81	140[d]	80	---	<0.5	1.7	<0.5	4.7	5.4
	03/01/92	23.36	<50	<50	---	<0.5	<0.5	<0.5	<0.5	3
	06/03/92	24.64	1,500	---	---	520	72	180	230	3
	09/01/92	26.74	130	---	---	16	1.8	1.4	3.4	1.3[e]
	12/04/92	27.14	150	---	---	360	1.8	0.7	2.1	3.3
	03/03/93	20.50	<50	---	---	1.5	<0.5	<0.5	<0.5	0.76
	06/17/93	22.42	1,600	---	---	340	120	120	440	3
	09/10/93	24.11	2,600	---	---	670	310	340	730	2.3
MW-2	02/24/92	19.61	17,000	2,700[c] 1,000[g]	---	6,200	550	1,600	1,900	200
	03/01/92	21.11	86,000		---	30,000	2,300	34,000	16,000	82
	06/03/92	21.58	87,000	---	---	28,000	2,000	18,000	10,000	<50
	09/01/92	23.46	110,000	---	---	21,000	1,900	13,000	7,800	83[h]
	12/04/92	23.89	42,000	---	---	15,000	960	2,400	2,900	100
	03/03/93	17.28	160,000	---	---	36,000	32,000	3,800	21,000	7.7
	03/03/93[h]	---	150,000	---	---	31,000	20,000	3,100	14,000	16
	06/17/93	19.06	65,000	---	---	34,000	3,200	15,000	11,000	37
	06/17/93[h]	19.06	62,000	---	---	28,000	2,700	14,000	10,000	36
	09/10/93[f]	20.88	72,000	---	---	24,000	2,300	16,000	11,000	28.0
	09/10/93[f,h]	20.88	71,000	---	---	23,000	2,300	15,000	10,000	27.0
MW-3	02/24/92	25.60	4,500	1,300[c]	---	97	78	<5	18	9.1
	03/01/92	26.00	2,200	440	---	69	<0.5	<0.5	<0.5	13
	06/03/92	27.70	4,100	---	---	13	44	72	65	16
	09/01/92	29.46	1,900	---	---	20	5.5	6.8	<5	19
	09/01/92[i]	29.46	1,900	---	---	21	3.4	6.6	<5	21
	12/04/92	29.93	2,400	---	---	8.2	<5	<5	<5	16
	12/04/92[i]	29.93	2,100	---	---	11	5.7	<0.5	<0.5	18
	03/03/93	23.08	5,100	---	---	63	75	61	150	3.3
	06/17/93	25.21	4,000	---	---	94	82	140	150	23
	09/10/93	26.95	3,200	---	---	140	12.5	12.5	12.5	20.0
Trip Blank	03/08/90		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	06/12/90		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	12/18/90		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	03/07/91		<50	---	---	<0.5	<0.5	<0.5	<0.5	---

-- Table 2 continues on next page --

TABLE 2. Analytic Results for Ground Water - Shell Service Station WIC #204-6852-0703, 1784 150th Avenue, San Leandro, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	POG	B	E	T	X	1,2-DCA
			<----------parts per billion (ug/l)---------->							
	06/07/91		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	09/17/91		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	12/09/91		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	02/24/92		<50	---	---	<0.5	0.6	2.5	2.2	---
	03/01/92		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	06/03/92		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	09/01/92		<50	---	---	<0.5	<0.5	<0.5	<0.5	<0.5
	12/04/92		<50	---	---	<0.5	<0.5	<0.5	<0.5	<0.5[i]
	03/03/93		<50	---	---	<0.5	<0.5	<0.5	<0.5	<0.5
	06/17/93		<50	---	---	<0.5	<0.5	<0.5	<0.5	<0.5
	09/10/93		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
Bailer Blank	03/08/90		<50	---	---	<0.5	<0.5	<0.5	<0.5	---
	09/01/92		<50	---		<0.5	<0.5	0.7	<0.5	<0.5
	12/04/92		60	---		<0.5	<0.5	<0.5	<0.5	<0.5[j]
DTSC MCLs			NE	NE	NE	1	680	100[k]	1,750	5.0

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
POG = Petroleum oil and grease by American Public Health Association Standard Method 503E or 5520F
B = Benzene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
T = Toluene by EPA Method 8020
X = Xylenes by EPA Method 8020
1,2-DCA = 1,2-Dichloroethane by EPA Method 601
--- = Not analyzed
<n = Not detected above method detection limit of n ppb
DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water
NE = Not established

Notes:

a = No total petroleum hydrocarbons as motor oil detected above modified EPA Method 8015 detection limit of 500 ppb
b = Tetrachloroethene (PCE) detected at 24 ppb by EPA Method 601; DTSC MCL for PCE = 5 ppb
c = Result is due to hydrocarbon compounds lighter than diesel
d = Result due to a non-gasoline hydrocarbon compound
e = In the matrix spike/matrix spike duplicate of sample MW-1, the RPD for Freon 113 and 1,3-dichloroebenze was greater than 25%
f = The MW-2 and Dup samples each contained 1.6 ppb of methylene chloride which is within normal laboratory background levels.
g = Diesel result is due to a petroleum hydrocarbon that is lighter than diesel
h = Sample MW-2 was diluted 1:100 for EPA Method 8010 due to the interfering hydrocarbon peaks
i = Duplicate sample
j = The trip and field blank samples from 12/04/92 contained 14 and 10 µg/L 1,3-dichloroebenzene, respectively
k = DTSC recommended action level for drinking water; MCL not established