Weiss Associates Environmental and Geologic Services

5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: **510-547-5420**

March 30, 1993

1107

Jennifer Eberle
Alameda County Department
of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621-1426

Re: ACDEH STID #1107
Shell Service Station
WIC #204-6001-0109
29 Wildwood Avenue
Piedmont, California
WA Job #81-463-203

Dear Ms. Eberle:

This letter describes recently completed and anticipated activities at the Shell service station referenced above (Figure 1). This status report satisfies the quarterly reporting requirements prescribed by California Administrative Code Title 23 Waters, Chapter 3, Subchapter 16, Article 5, Section 265.d. Included below are descriptions and results of activities performed in the first quarter 1993 and proposed work for the second quarter 1993.

First Quarter 1993 Activities:

- Blaine Tech Services, Inc. (BTS) San Jose, California measured ground water depths in five of the six wells and collected water samples from all six wells. The ground water depth was not measured in well E-4 since it is a flowing artesian well. BTS' report describing these activities and the analytic report for the ground water samples are included as Attachment A.

- Weiss Associates (WA) compiled the ground water elevation and analytic data (Tables 1 and 2) and prepared a ground water elevation contour map (Figure 2).

- Shell and WA submitted an application to the Oakland Engineering Services Department for a minor encroachment permit to install a ground water monitoring well on Grand Avenue (Figure 2). It is our experience that the City of Oakland can take several months to approve these permits

- Although WA intended to measure dissolved oxygen concentrations in all site wells, this was inadvertently missed this quarter. However, WA will measure dissolved oxygen concentrations in all site wells when the new well is installed or during the next quarterly sampling event, whichever comes first.

Anticipated Second Quarter 1993 Activities:

- WA will submit a report presenting the results of second quarter 1993 ground water sampling and ground water depth measurements. The report will include tabulated ground water elevation and analytic results including dissolved oxygen concentration and a ground water elevation contour map.

Conclusions and Recommendations

As we discussed in our meeting, WA recommends measuring dissolved oxygen concentrations in ground water to assess the viability of hydrocarbon biodegradation by naturally occurring microorganisms. WA will review the dissolved oxygen data to assess whether natural biodegradation appears to be sufficient to minimize hydrocarbon plume migration.

Please call if you have any questions.

→ his sign?

Sincerely,
Weiss Associates

REGISTERED GEOLOGIST
JAMES W. CARMODY
No. EG 1576
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

J. Michael Asport
Technical Assistant

for Joseph P. Theisen, C.E.G.
Senior Hydrogeologist

JMA/JPT:jma

J:\SHELL\450\QMRPTS\463QMFES.WP

Attachments: Figures
Tables
A - BTS' Ground Water Monitoring Report

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

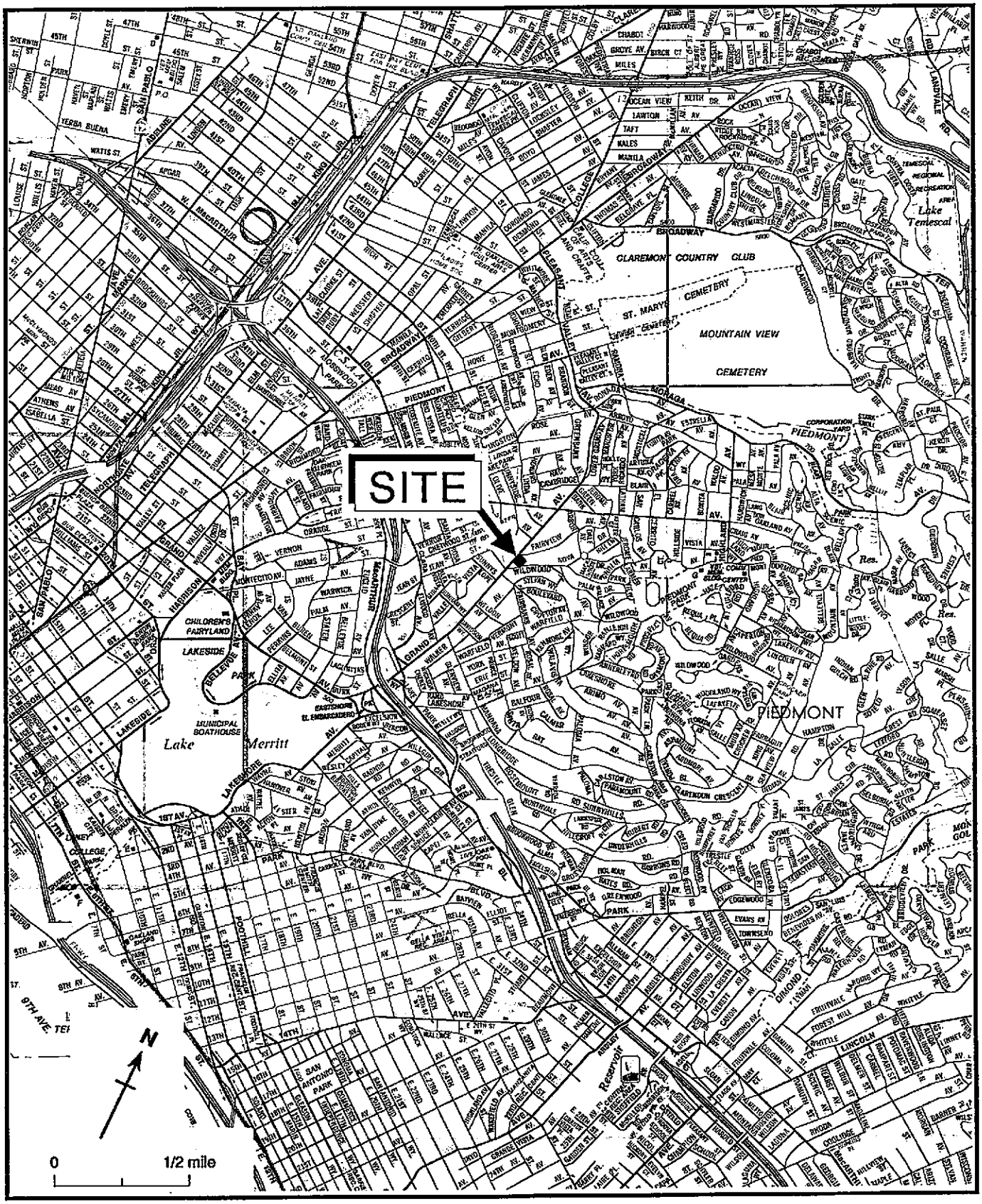

Figure 1. Site Location Map - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

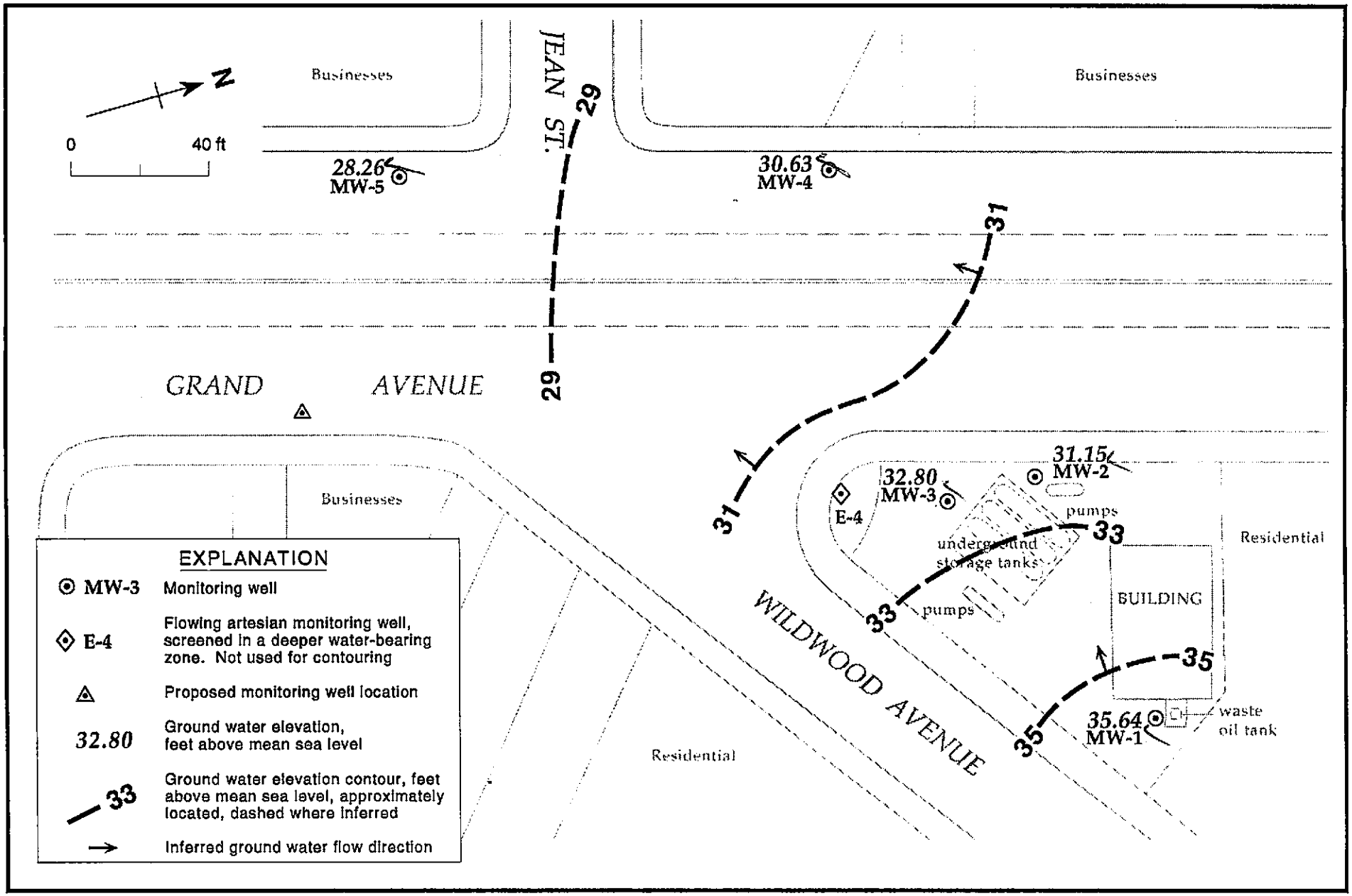

Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - January 20, 1993 - Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

3/22/93

TABLE 1. Ground Water Elevations - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
MW-1	07/12/89	37.96	2.76	35.20
	01/30/90		3.10	34.86
	04/27/90		3.24	34.72
	07/31/90		4.26	33.70
	10/30/90		4.25	33.71
	01/31/91		3.66	34.30
	04/30/91		3.46	34.50
	07/30/91		4.14	33.82
	10/29/91		3.96	34.00
	01/20/92		3.59	34.37
	04/14/92		3.18	31.71
	07/21/92		4.17	33.79
	10/02/92		4.29	33.67
	01/20/93		2.32	35.64
MW-2	07/12/89	34.89	3.66	31.23
	01/30/90		3.49	31.40
	04/27/90		3.79	31.10
	07/31/90		4.03	30.86
	10/30/90		4.21	30.68
	01/31/91		4.09	30.80
	04/30/91		3.95	30.94
	07/30/91		4.07	30.82
	10/29/91		4.11	30.78
	01/20/92		3.86	31.03
	04/14/92		3.66	34.30
	07/21/92		3.92	30.97
	10/02/92		4.45	30.44
	01/20/93		3.74	31.15
MW-3	07/12/89	35.00	3.83	31.17
	01/30/90		3.24	31.76
	04/27/90		4.02	30.98
	07/31/90		4.31	30.69
	10/30/90		4.52	30.48
	01/31/91		4.33	30.67
	04/30/91		3.79	31.21
	07/30/91		4.37	30.63
	10/29/91		4.00	31.00
	01/20/92		3.87	31.13
	04/14/92		3.15	31.85
	07/21/92		4.17	30.83
	10/02/92		4.43	30.57
	01/20/93		2.20	32.80

— Table 2 continues on next page —

TABLE 1. Ground Water Elevations - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
MW-4	01/30/90	33.73	4.50	29.23
	04/27/90		3.62	30.11
	07/31/90		4.19	29.54
	10/30/90		4.19	29.54
	01/31/91		4.49	29.24
	04/30/91		4.02	29.71
	07/30/91		4.39	29.34
	10/29/91		3.75	29.98
	01/20/92		3.94	29.79
	04/14/92		3.71	30.02
	07/21/92		4.02	29.71
	10/02/92		4.13	29.60
	01/20/93		3.10	30.63 ✓
MW-5	01/30/90	31.38	7.12	24.26
	04/27/90		4.19	27.19
	07/31/90		4.09	27.29
	10/30/90		4.39	26.99
	01/31/91		4.49	26.89
	04/30/91		4.27	27.11
	07/30/91		4.32	27.06
	10/29/91		3.79	27.59
	01/20/92		4.09	27.29
	04/14/92		4.12	27.26
	07/21/92		4.13	27.25
	10/02/92		4.30	27.08
	01/20/93		3.12	28.26 ✓
E-4	07/12/89	34.63	a	>39.13
	01/30/90		b	>34.63
	04/27/90		b	>34.63
	07/31/90		b	>34.63
	10/30/90		b	>34.63
	01/31/91		b	>34.63
	04/30/91		b	>34.63
	07/30/91		b	>34.63
	10/29/91		b	>34.63
	01/20/92		b	>34.63
	04/14/92		b	>34.63
	07/21/92		b	>34.63
	10/02/92		b	>34.63
	01/20/93		b	>34.63

— Table 2 continues on next page —

TABLE 1. Ground Water Elevations - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

a = Well E-4 is a flowing artesian well. The potentiometric surface was greater than 4.5 ft above ground surface.

b = Well E-4 potentiometric surface was higher than the top of well casing.

Table 2. Analytic Results for Ground Water, Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	B	E	T	X	HVOCs
			<--------	parts per million (mg/L)				-------->
MW-1	07/12/89	2.76	<0.05	<0.0005	<0.001	<0.001	<0.003	a
	01/30/90	3.10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	3.24	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	4.26	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	4.25	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	3.66	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/30/91	3.46	<0.05	0.0008	0.0006	<0.0005	0.0012	---
	07/30/91	4.14	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/29/91	3.96	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/92	3.59	<0.03	<0.0003	<0.0003	<0.0003	<0.0003	---
	04/14/92	3.18	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/21/92	4.17	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/02/92	4.29	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/93	2.32	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
MW-2	07/12/89	3.66	0.060	0.0027	<0.001	<0.001	<0.003	a
	01/30/90	3.49	<0.05	0.0066	0.00054	<0.0005	0.00093	---
	04/27/90	3.79	0.060	0.0021	<0.0005	<0.0005	<0.0005	---
	07/31/90	4.03	0.070	0.0015	<0.0005	<0.0005	<0.0005	---
	10/30/90	4.21	0.070	<0.0005	<0.0005	0.0007	0.0016	---
	01/31/91	4.09	0.080	<0.0005	0.0009	<0.0005	0.0019	---
	04/30/91	3.95	0.10	0.0059	0.0007	0.0006	0.0020	---
	07/30/91	4.07	<0.05	<0.0005	<0.0005	<0.0007	<0.0005	---
	10/29/91	4.11	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/92	3.86	<0.03	0.00084	<0.00041	<0.0003	<0.00048	---
	04/14/92	3.66	0.07	0.016	0.0031	<0.0005	0.0021	---
	07/21/92	3.92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/02/92	4.45	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/93	3.74	<0.05	0.0038	0.00052	<0.0005	<0.0005	---
MW-3	07/12/89	3.83	3.9	0.38	0.099	0.041	0.030	b
	01/30/90	3.24	5.5	0.44	0.079	0.035	0.13	---
	04/27/90	4.02	4.5	0.31	0.037	0.026	0.11	---
	07/31/90	4.31	3.5	0.21	0.0084	0.017	0.062	---
	10/30/90	4.52	2.3	0.061	<0.0005	<0.0005	0.028	---
	01/31/91	4.33	4.1	0.30	0.019	0.020	0.081	---
	04/30/91	3.79	3.8	0.37	0.0086	0.019	0.060	---
	07/30/91	4.37	3.3	0.16	0.015	0.013	0.087	---
	10/29/91	4.00	1.0	0.035	0.0029	0.0028	0.0081	---
	01/20/92	3.87	6.9	0.38	0.047	0.018	0.048	---
	04/14/92	3.15	6.0	0.48	0.041	0.038	0.055	---
	07/21/92	4.17	3.7	0.33	0.03	0.013	0.023	---
	10/02/92	4.43	4.2	0.26	0.013	0.010	0.012	---

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Table 3. Analytic Results for Ground Water, Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	B	E	T	X	HVOCs
			<----------ppb----------ppb--parts per million (mg/L)---------->					
MW-3	01/20/93	2.20	4.2 4,200	0.36 360	0.032	0.015	0.026	---
	01/20/93[c] dup		3.9	0.37	0.032	0.015	0.026	---
MW-4	01/31/90	4.50	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	3.62	0.13[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	4.19	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	4.19	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	4.49	0.05[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/30/91	4.02	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	e
	07/30/91	4.39	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/29/91	3.75	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/92	3.94	<0.03	<0.0003	<0.0003	<0.0003	<0.0003	---
	04/14/92	3.71	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/21/92	4.02	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/02/92	4.13	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/93	3.10	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
MW-5	01/31/90	7.12	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	4.19	0.21[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	4.09	0.090	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	4.39	0.10	0.0008	0.0006	0.0007	0.0014	---
	01/31/91	4.49	0.080[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/30/91	4.27	0.09	<0.0005	<0.0005	<0.0005	<0.0005	f
	07/30/91	4.37	0.09	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/29/91	3.79	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/92	4.09	<0.03	<0.0003	<0.0003	<0.0003	<0.0003	---
	04/14/92	4.12	<0.05[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/21/92	4.13	0.074[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/02/92	4.30	0.076[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/93	3.12	0.072[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
E-4	07/12/89	g	<0.05	<0.0005	<0.001	<0.001	<0.003	---
	01/31/90	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	g	0.12[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/30/91	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	a
	07/30/91	g	<0.05	<0.0005	<0.0005	0.0006	<0.0005	---
	10/29/91	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/92	g	<0.03	<0.0003	<0.0003	<0.0003	<0.0003	---
	04/14/92	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/21/92	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---

-- Table 2 continues on next page --

Table 3. Analytic Results for Ground Water, Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	B	E	T	X	HVOCs
			<----------parts per million (mg/L)---------->					
E-4	10/02/92	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/93	g	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
Trip Blank	07/12/89		<0.05	<0.0005	<0.001	<0.001	<0.003	---
	01/31/90		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/30/91		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/30/91		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/29/91		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/02/92		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/20/93		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
Bailer Blank	04/27/90		0.11[d]	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91		<0.05	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/02/92		ND	ND	ND	ND	ND	
DTSC MCLs			NE	0.001	0.680	0.10[h]	1.750	i

Abbreviations:

TPH-G = Total Petroleum Hydrocarbons as Gasoline by Modified EPA Method 8015
B = Benzene by EPA Method 602 or 8020
E = Ethylbenzene by EPA Method 602 or 8020
T = Toluene by EPA Method 602 or 8020
X = Xylenes by EPA Method 602 or 8020
HVOCs = Halogenated volatile organic compounds by EPA Method 601 or 624
--- = Not analyzed
NE = Not established
DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water
<n = Not detected above detection limit of n ppm

Notes:

a = No HVOCs detected.
b = BETX detected at 0.41, 0.097, 0.036 and 0.30 ppm, respectively, by EPA Method 624.
c = Duplicate sample
d = Chromatogram contained discrete peaks; not representaive of gasoline
e = 0.015 ppm tetrachloroethene (PCE), 0.0041 ppm trichloroethene (TCE) and 0.0034 ppm trans-1,2-dichloroethene (DCE) detected
f = 0.22 ppm PCE, 0.022 ppm TCE and 0.017 ppm DCE detected
g = Artesian well; potentiometric surface above top-of-casing elevation.
h = DTSC recommended action level for drinking water; MCL not established.
i = DTSC MCLs for PCE = 0.005 ppm; TCE = 0.005 ppm; DCE = 0.01 ppm.

ATTACHMENT A

BTS' GROUND WATER MONITORING REPORT

BLAINE
TECH SERVICES INC.

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

February 8, 1993

Shell Oil Company
P.O. Box 5278
Concord, CA 94520-9998

Attn: Daniel T. Kirk

SITE:
Shell WIC # 204-6001-0109
29 Wildwood Avenue
Piedmont, California

QUARTER:
1st quarter of 1993

QUARTERLY GROUNDWATER SAMPLING REPORT 930120-M-1

This report contains data collected during routine inspection, gauging and sampling of groundwater monitoring wells performed by Blaine Tech Services, Inc. in response to the request of the consultant who is overseeing work at this site on behalf of our mutual client, Shell Oil Company. Data collected in the course of our field work is presented in a TABLE OF WELL GAUGING DATA. The field information was collected during our preliminary gauging and inspection of the wells, the subsequent evacuation of each well prior to sampling, and at the time of sampling.

Measurements taken include the total depth of the well and the depth to water. The surface of the water was further inspected for the presence of immiscibles which may be present as a thin film (a sheen on the surface of the water) or as a measurable free product zone (FPZ). At intervals during the evacuation phase, the purge water was monitored with instruments that measure electrical conductivity (EC), potential hydrogen (pH), temperature (degrees Fahrenheit), and turbidity (NTU). In the interest of simplicity, fundamental information is tabulated here, while the bulk of the information is turned over directly to the consultant who is making professional interpretations and evaluations of the conditions at the site.

TABLE OF WELL GAUGING DATA

WELL I.D.	WELL DIAMETER (inches)	DATA COLLECTION DATE	MEASUREMENTS REFERENCED TO	QUALITATIVE OBSERVATIONS (sheen)	DEPTH TO FIRST IMMISCIBLE LIQUID (FPZ) (feet)	THICKNESS OF IMMISCIBLE LIQUID ZONE (feet)	VOLUME OF IMMISCIBLES REMOVED (ml)	DEPTH TO WATER (feet)	DEPTH TO WELL BOTTOM (feet)
MW-1	4	01-20-93	TOP OF PIPE	--	NONE	--	--	2.32	13.10
MW-2	4	01-20-93	TOP OF PIPE	--	NONE	--	--	3.74	11.50
MW-3 *	4	01-20-93	TOP OF PIPE	ODOR	NONE	--	--	2.20	9.04
MW-4	4	01-20-93	TOP OF PIPE	--	NONE	--	--	3.10	12.50
MW-5	4	01-20-93	TOP OF PIPE	--	NONE	--	--	3.12	16.00
E-4	3	01-20-93	TOP OF PIPE	--	NONE	--	--	**	34.20

* Sample DUPE was a duplicate sample taken from well MW-3.

** Depth of water could not be measured due to water level being above casing.

STANDARD PROCEDURES

Evacuation

Groundwater wells are thoroughly purged before sampling to insure that the sample is collected from water that has been newly drawn into the well from the surrounding geologic formation. The selection of equipment to evacuate each well is based on the physical characteristics of the well and what is known about the performance of the formation in which the well has been installed. There are several suitable devices which can be used for evacuation. The most commonly employed devices are air or gas actuated pumps, electric submersible pumps, and hand or mechanically actuated bailers. Our personnel frequently employ USGS/Middleburg positive displacement pumps or similar air actuated pumps which do not agitate the water standing in the well.

Normal evacuation removes three case volumes of water from the well. More than three case volumes of water may be removed in cases where more evacuation is needed to achieve stabilization of water parameters. Less than three case volumes of water may be obtained in cases where the well dewaters and does not recharge to 80% of its original volume within two hours and any additional time our personnel have reason to remain at the site. In such cases, our personnel return to the site within twenty four hours and collect sample material from the water which has recharged into the well case.

Decontamination

All apparatus is brought to the site in clean and serviceable condition. The equipment is decontaminated after each use and before leaving the site.

Free Product Skimmer

The column headed, VOLUME OF IMMISCIBLES REMOVED (ml) is included in the TABLE OF WELL GAUGING DATA to cover situations where a free product skimming device must be removed from the well prior to gauging. Skimmers are installed in wells with a free product zone on the surface of the water. The skimmer is a free product recovery device which often prevents normal well gauging and free product zone measurements. The 2.0" and 3.0" PetroTraps fall into the category of devices that obstruct normal gauging. In cases where the consultant elects to have our personnel pull the skimmers out of the well and gauge the well, our personnel perform the additional task of draining the accumulated free product out of the PetroTrap before putting it back in the well. This recovered free product is measured and logged in the VOLUME OF IMMISCIBLES REMOVED column. Gauging at such site is performed in accordance with specific directions from the professional consulting firm overseeing work at the site on Shell's behalf.

Sample Containers

Sample material is collected in specially prepared containers which are provided by the laboratory that performs the analyses.

Sampling

Sample material is collected in stainless steel bailer type devices normally fitted with both a top and a bottom check valve. Water is promptly decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA standard for handling volatile organic and semi-volatile compounds.

Following collection, samples are promptly placed in an ice chest containing prefrozen blocks of an inert ice substitute such as Blue Ice or Super Ice. The samples are maintained in either an ice chest or a refrigerator until delivered into the custody of the laboratory.

Sample Designations

All sample containers are identified with a site designation and a discrete sample identification number specific to that particular groundwater well. Additional standard notations (e.g. time, date, sampler) are also made on the label. Either the requested analyses or the specific analytes are written on the sample label (e.g. TPH-G, BTEX).

Chain of Custody

Samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under a standard Shell Oil Company chain of custody. If the samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the chain of custody (time, date, and signature of the person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

Hazardous Materials Testing Laboratory

Samples obtained at this site were delivered to Sequoia Analytical Laboratory in Redwood City, California. Sequoia Analytical Laboratory is certified by the California Department of Health Services as a Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1210.

Objective Information Collection

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. In order to avoid compromising the objectivity neces-

sary for the proper and disinterested performance of this work, Blaine Tech Services, Inc.

performs no consulting and does not become involved in the marketing or installation of remedial systems of any kind. Blaine Tech Services, Inc. is concerned only with the generation of objective information, not with the use of that information to support evaluations and recommendations concerning the environmental condition of the site. Even the straightforward interpretation of objective analytical data is better performed by interested regulatory agencies, and those engineers and geologists who are engaged in the work of providing professional opinions about the site and proposals to perform additional investigation or design remedial systems.

Reportage

Submission of this report and the attached laboratory report to interested regulatory agencies is handled by the consultant in charge of the project. Any professional evaluations or recommendations will be made by the consultant under separate cover.

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/lpn

attachments: chain of custody
certified analytical report

cc: Weiss Associates
5500 Shellmound Street
Emeryville, CA 94608-2411
ATTN: Kristina Koltavary

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date:
Page 1 of 1

Site Address: 29 Wildwood Ave, Piedmont

WIC #: 204-6001-0109

Shell Engineer: DAN KIRK — Phone No.: (510) 675-6171 — Fax #:

Consultant Name & Address: BLAINE TECH SERVICES, 985 TIMOTHY SQ.

Consultant Contact: GLEN BENNETT — Phone No.: 408/995-5535 — Fax #:

Comments:

Sampled by: J. McCann

Printed Name: JIM McCANN

LAB: SEQUOIA

Sample ID	Date	Sludge	Soil	Water	Air	No. of cont.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020			Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
MW-1	1/10/93			X		3						X								
MW-2				X		3						X								
MW-3				X		3						X								
MW-4				X		3						X								
MW-5				X		3						X								
EW-4				X		3						X								
DUPE				X		3						X								
TRIP BLANK				X		2						X								

CHECK ONE (1) BOX ONLY — GT/DT

- Quarterly Monitoring ☒ — $441
- Site Investigation ☐ — $441
- Soil Closure/Disposal ☐ — $442
- Water Closure/Disposal ☐ — $443
- Soil/Air Rem. or Sys. O & M ☐ — $482
- Water Rem. or Sys. O & M ☐ — $483
- Other ☐

TURN AROUND TIME

- 24 hours ☐
- 48 hours ☐
- 15 days ☒ (Normal)
- Other ☐ ____

NOTE: Notify lab as soon as Possible of 24/48 hr. TAT.

	Printed Name:	Date:	Time:
Relinquished By (signature): J. McCann	JIM McCANN	1-21-93	1555
Relinquished By (signature):	Printed Name:	Date:	Time:
Relinquished By (signature):	Printed Name:	Date:	Time:

	Printed Name:	Date:	Time:
Received (signature): Rebekah J. Harper	Rebekah J. Harper	1/21/93	1555
Received (signature):	Printed Name:	Date:	Time:
Received (signature):	Printed Name:	Date:	Time:

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.
985 Timothy Drive
San Jose, CA 95133
Attention: Glen Bennett

Project: SHELL 29 Wildwood Ave, Piedmont

Enclosed are the results from 8 water samples received at Sequoia Analytical on January 21,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3A18401	Water, MW-1	1/20/93	EPA 5030/8015/8020
3A18402	Water, MW-2	1/20/93	EPA 5030/8015/8020
3A18403	Water, MW-3	1/20/93	EPA 5030/8015/8020
3A18404	Water, MW-4	1/20/93	EPA 5030/8015/8020
3A18405	Water, MW-5	1/20/93	EPA 5030/8015/8020
3A18406	Water, EW-4	1/20/93	EPA 5030/8015/8020
3A18407	Water, Duplicate	1/20/93	EPA 5030/8015/8020
3A18408	Water, Trip Blank	1/20/93	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Maria Lee

Maria Lee
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.	Client Project ID:	SHELL 29 Wildwood Ave, Piedmont	Sampled: Jan 20, 1993
985 Timothy Drive	Sample Matrix:	Water	Received: Jan 21, 1993
San Jose, CA 95133	Analysis Method:	EPA 5030/8015/8020	Reported: Feb 1, 1993
Attention: Glen Bennett	First Sample #:	3A18401	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3A18401 MW-1	Sample I.D. 3A18402 MW-2	Sample I.D. 3A18403 MW-3	Sample I.D. 3A18404 MW-4	Sample I.D. 3A18405 MW-5	Sample I.D. 3A18406 EW-4
Purgeable Hydrocarbons	50	N.D.	N.D.	4,200	N.D.	72	ND
Benzene	0.50	N.D.	3.8	360	N.D.	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	15	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	0.52	32	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	26	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	GAS	--	DISCRETE PEAK	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	20	1.0	1.0	1.0
Date Analyzed:	1/25/93	1/25/93	1/25/93	1/25/93	1/25/93	1/25/93
Instrument Identification:	GCHP-2	GCHP-2	GCHP-2	GCHP-3	GCHP-2	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	101	100	102	100	105	99

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.	Client Project ID:	SHELL 29 Wildwood Ave, Piedmont	Sampled:	Jan 20, 1993
985 Timothy Drive	Sample Matrix:	Water	Received:	Jan 21, 1993
San Jose, CA 95133	Analysis Method:	EPA 5030/8015/8020	Reported:	Feb 1, 1993
Attention: Glen Bennett	First Sample #:	3A18407		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3A18407 Duplicate	Sample I.D. 3A18408 Trip Blank	Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	50	3,900	N.D.				
Benzene	0.50	370	N.D.				
Toluene	0.50	15	N.D.				
Ethyl Benzene	0.50	32	N.D.				
Total Xylenes	0.50	26	N.D.				
Chromatogram Pattern:		GAS	--				

Quality Control Data

Report Limit Multiplication Factor:	20	1.0
Date Analyzed:	1/25/93	1/25/93
Instrument Identification:	GCHP-2	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	104	94

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.
985 Timothy Drive
San Jose, CA 95133
Attention: Glen Bennett

Client Project ID: SHELL 29 Wildwood Ave, Piedmont

QC Sample Group: 3A18401-08

Reported: Feb 1, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 25, 1993	Jan 25, 1993	Jan 25, 1993	Jan 25, 1993
QC Sample #:	G3A13705	G3A13705	G3A13705	G3A13705
Sample Conc.:	ND	ND	ND	ND
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	11	11	11	33
Matrix Spike % Recovery:	110	110	110	110
Conc. Matrix Spike Dup.:	10	11	10	31
Matrix Spike Duplicate % Recovery:	100	110	100	103
Relative % Difference:	9.5	0.0	9.5	6.2

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

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(415) 364-9600 • FAX (415) 364-9233

Blaine Tech Services, Inc.
985 Timothy Drive
San Jose, CA 95133
Attention: Glen Bennett

Client Project ID: SHELL 29 Wildwood Ave, Piedmont

QC Sample Group: 3A18401-08

Reported: Feb 1, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 25, 1993	Jan 25, 1993	Jan 25, 1993	Jan 25, 1993
QC Sample #:	G3A13704	G3A13704	G3A13704	G3A13704
Sample Conc.:	ND	ND	ND	ND
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.8	9.9	10	30
Matrix Spike % Recovery:	98	99	100	100
Conc. Matrix Spike Dup.:	9.9	9.9	10	30
Matrix Spike Duplicate % Recovery:	99	99	100	100
Relative % Difference:	1.0	0.0	0.0	0.0

SEQUOIA ANALYTICAL

Maria Lee
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

WELL GAUGING DATA

WIC#: 204-6001-0109

Project # 930120-M1 Date 1-20-93 Client SHELL

Site 29 Wildwood Ave, Piedmont Sampler Jim McCann

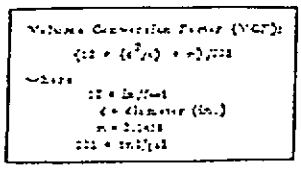
	Well I.D.	Well Size (in.)	Sheen/ Odor	Depth to Immisible Liquid (feet)	Thickness of Immisible Liquid (ft.)	Volume of Immisibles Removed (ml)	Depth to Water (feet)	Depth to Well Bottom (feet)	Measured to: Top of Pipe or Grade
*	MW-1	4					2.72	13.10	P
*	MW-2	4					3.74	11.50	P
*	MW-3	4					2.20	9.04	P
	MW-4	4					3.10	12.50	P
	MW-5	4					3.12	16.0	P
**	E-1	3					-0-	34.20	P

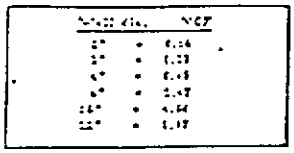
* - Well box full of runoff

** - Artesian water level above TOB

SHELL WELL MONITORING DATA SHEET

Project #: 930120-M1	Wic # 204-6001-0109
Sampler: Jim McCann	Date Sampled: 1-20-93
Well I.D.: MW-1	Well Diameter: (circle one) 2 3 (4) 6 ___
Total Well Depth: Before 13.10 After	Depth to Water: Before 2.32 After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: (PVC) Grade	Other --





7.8	x	3	=	21.0
1 Case Volume		Specified Volumes		gallons

Purging: Bailer ☒
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Type of Installed Pump _____

Sampling: Bailer ☒
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Installed Pump ☐

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
1052	57.8	6.7	1500	>200	7.0	
1057	56.9	6.4	1200	>200	14.0	
1103	57.2	6.2	1000	>200	21.0	DO = 10.1 ppm

Did Well Dewater? N If yes, gals. Gallons Actually Evacuated: 21.0

Sampling Time: 1105

Sample I.D.: MW-1 Laboratory: SEQUOIA

Analyzed for: TPH (Gas), BTEX

Duplicate I.D.: — Cleaning Blank I.D.: —

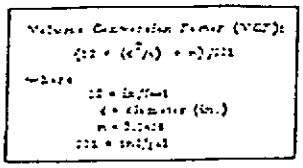
Analyzed for: —

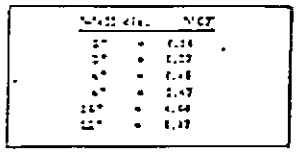
Shipping Notations: —

Additional Notations:

SHELL WELL MONITORING DATA SHEET

Project #: 930120-M1	Wic # 204-6001-0109
Sampler: Jim McCann	Date Sampled: 1-20-93
Well I.D.: MW-2	Well Diameter: (circle one) 2 3 (4) 6 ___
Total Well Depth: Before 11.50 After	Depth to Water: Before 3.74 After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: (TOC)	Grade Other --





5.04 x 3 = 15.12

1 Case Volume | Specified Volumes | gallons

Purging: Bailer ☒
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Type of Installed Pump _____

Sampling: Bailer ☒
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Installed Pump ☐

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
1134	59.2	6.2	800	>200	5.25	
1138	Dewatered				9.0	SWL = 5.30 DTW
1345	57.6	6.1	800	>200	9.25	DTW = 3.22
						DO 8.6 ppm

Did Well Dewater? Yes If yes, gals. 9.0 Gallons Actually Evacuated: 9.25

Sampling Time: 1350

Sample I.D.: MW2 Laboratory: SEQUOIA

Analyzed for: TPH(Gas), BTEX

Duplicate I.D.: Cleaning Blank I.D.:

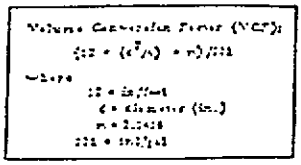
Analyzed for:

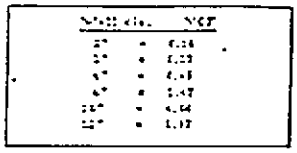
Shipping Notations:

Additional Notations:

SHELL WELL MONITORING DATA SHEET

Project #: 930120-M1	Wic #: 204-6001-0109
Sampler: Jim McCann	Date Sampled: 1-20-93
Well I.D.: MW-3	Well Diameter: (circle one) 2 3 (4) 6 ___
Total Well Depth: Before 9.04 After	Depth to Water: Before 2.20 After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: (TVC) Grade Other --	





4.75 (1 Case Volume) x 3 (Specified Volumes) = 13.35 (gallons)

Purging: Bailer ☒
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Type of Installed Pump ____

Sampling: Bailer ☒
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Installed Pump ☐

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
1319	52.0	6.5	800	>200	4.5	Strong odor
1323	53.4	6.6	700	>200	9.0	
1326	53.5	6.6	800	>200	13.50	
						DO. 7.9 ppm

Did Well Dewater? No If yes, gals. Gallons Actually Evacuated: 13.50

Sampling Time: 1330

Sample I.D.: MW-3 Laboratory: Sequoia

Analyzed for: TPH (Gas), BTEX

Duplicate I.D.: DUPE Cleaning Blank I.D.:

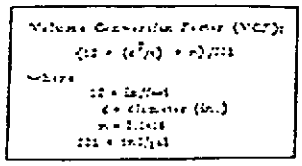
Analyzed for: TPH (Gas) BTEX

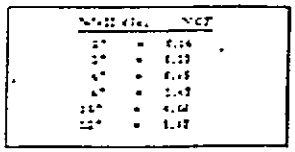
Shipping Notations: —

Additional Notations:

SHELL WELL MONITORING DATA SHEET

Project #: 930180-M1	Wic #: 204-6001-0109
Sampler: Jim McCann	Date Sampled: 1-20-93
Well I.D.: MW-4	Well Diameter: (circle one) 2 3 4 6 ___
Total Well Depth: Before 12.50 After	Depth to Water: Before 5.10 After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: TVC	Grade Other --





6.11 x 3 = 18.33

1 Case Volume | Specified Volumes | gallons

Purging: Bailer ☐ Middleburg ☐ Electric Submersible ☐ Suction Pump ☐ Type of Installed Pump ___

Sampling: Bailer ☐ Middleburg ☐ Electric Submersible ☐ Suction Pump ☐ Installed Pump ☐

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
1455	58.0	6.5	800	>200	6.25	
1500	57.9	6.6	801	>200	12.50	
1510	57.6	6.6	800	>200	18.50	
						KNUT
						DO=7.9 PPM

Did Well Dewater? No If yes, gals. Gallons Actually Evacuated: 18.50

Sampling Time: 1515

Sample I.D.: MW-4 Laboratory: SEQUOIA

Analyzed for: TPH (gas), BTEX

Duplicate I.D.: ___ Cleaning Blank I.D.: ___

Analyzed for: ___

Shipping Notations: ___

Additional Notations:

SHELL WELL MONITORING DATA SHEET

Project #: 930120-M1	Wic # 204-6001-0109
Sampler: Jim McCann	Date Sampled: 1-20-93
Well I.D.: MW-5	Well Diameter: (circle one) 2 3 4 6
Total Well Depth: Before 16.0 After	Depth to Water: Before 3.12 After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: PVC Grade Other --	

Volume Conversion Factor (VCF):
(π × (d²/4) × h)/231
Where
π = 3.1416
d = Diameter (in.)
h = Height (ft.)
231 = in³/gal

Well dia.	VCF
2"	0.16
3"	0.37
4"	0.65
6"	1.47
8"	2.60
10"	4.08
12"	5.87

8.37 (1 Case Volume) × 3 (Specified Volumes) = 25.11 gallons

Purging: Bailer ☒ Middleburg ☐ Electric Submersible ☐ Suction Pump ☐ Type of Installed Pump _____

Sampling: Bailer ☒ Middleburg ☐ Electric Submersible ☐ Suction Pump ☐ Installed Pump ☐

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
1420	57.6	6.5	880	>200	8.50	
1429	54.6	10.60	800	>200	17.0	
1435	54.2	6.6	880	>200	25.25	
						DO = 9.3ppm

Did Well Dewater? N If yes, gals. Gallons Actually Evacuated: 25.25

Sampling Time: 1440

Sample I.D.: MW-5 Laboratory: SEQUOIA

Analyzed for: TPH (gas), BTEX

Duplicate I.D.: — Cleaning Blank I.D.: —

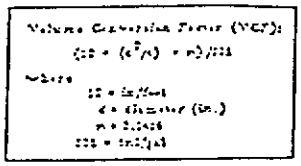
Analyzed for: —

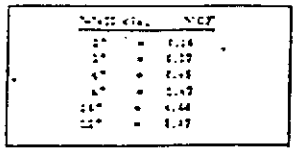
Shipping Notations: —

Additional Notations:

SHELL WELL MONITORING DATA SHEET

Project #: 930820-M1	Wic #: 204-6001-0109
Sampler: Jim McCann	Date Sampled: 1-20-93
Well I.D.: E-4	Well Diameter: (circle one) 2 (3) 4 6 ___
Total Well Depth: Before 34.20 After	Depth to Water: Before 0 After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: (PVC) Grade	Other --





12.65	x	3	=	37.95
1 Case Volume		Specified Volumes		gallons

Purging: Bailer (X)
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Type of Installed Pump _____

Sampling: Bailer (X)
Middleburg ☐
Electric Submersible ☐
Suction Pump ☐
Installed Pump ☐

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
1258	61.8	6.2	1300	>200	12.75	
1307	Dewatered	~	~	~	2200	80 i. - 6.84 DTW
~~1355~~						~~DTW = 32~~
1555	61.7	6.1	1200	>200	22.25	DTW = 6.5

Did Well Dewater? Yes If yes, gals. 220 Gallons Actually Evacuated: 22.25

Sampling Time: 1600

Sample I.D.: E-4 Laboratory: SEQUOIA

Analyzed for: TPH (Gas), BTEX

Duplicate I.D.: — Cleaning Blank I.D.: —

Analyzed for: —

Shipping Notations: —

Additional Notations: