Weiss Associates
Environmental and Geologic Services
5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: 510-547-5420

April 15, 1993

Richard Hiett
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, CA 94612

Re: Shell Service Station
WIC #204-5508-5801
500 - 40th Street
Oakland, California
WA Job #81-601-203

Dear Mr. Hiett:

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) of San Jose, California measured depths to ground water and collected ground water samples from nine of the twelve site wells. Wells MW-9, MW-11 and MW-13 were inaccessible and were not sampled. 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).

Anticipated Second Quarter 1993 Activities:

WA will submit a report presenting the results of the second quarter 1993 ground water sampling and ground water depth measurements. The report will include tabulated chemical analytic results, ground water elevation contour map, and a benzene concentrations contour map.

Conclusions and Recommendations:

WA recommends continued ground water sampling to monitor ground water flow directions and hydrocarbon concentrations.

California Regional Water Quality Control Board (RWQCB) personnel have indicated that the RWQCB will allow well sampling frequency reductions on a site specific basis if the frequency reductions are justified by site conditions. WA reviewed historic ground water data for this site to determine the appropriate well sampling frequencies. Our criteria used to determine sampling frequencies is described in detail in Attachment B. Our specific recommendations for this site are presented in Table 3. WA will implement these well sampling frequencies unless we are notified otherwise within 60 days.

Please call if you have any questions.

Sincerely,
Weiss Associates

J. Michael Asport
Technical Assistant

for

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

JMA/JPT:jma

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Attachments: Figures
Tables
A - BTS' Ground Water Monitoring Report
B - Sampling Frequency Modifications

cc: Dan Kirk, Shell, Shell Oil Company, P.O. Box 5728, Concord, CA 94520-9998
Larry Turner, Shell Oil Company, P.O. Box 4848, Anaheim, CA 92803
Brian Oliva, Alameda County Department of Environmental Health, 80 Swan Way, Room 200, Oakland, CA 94621-1426

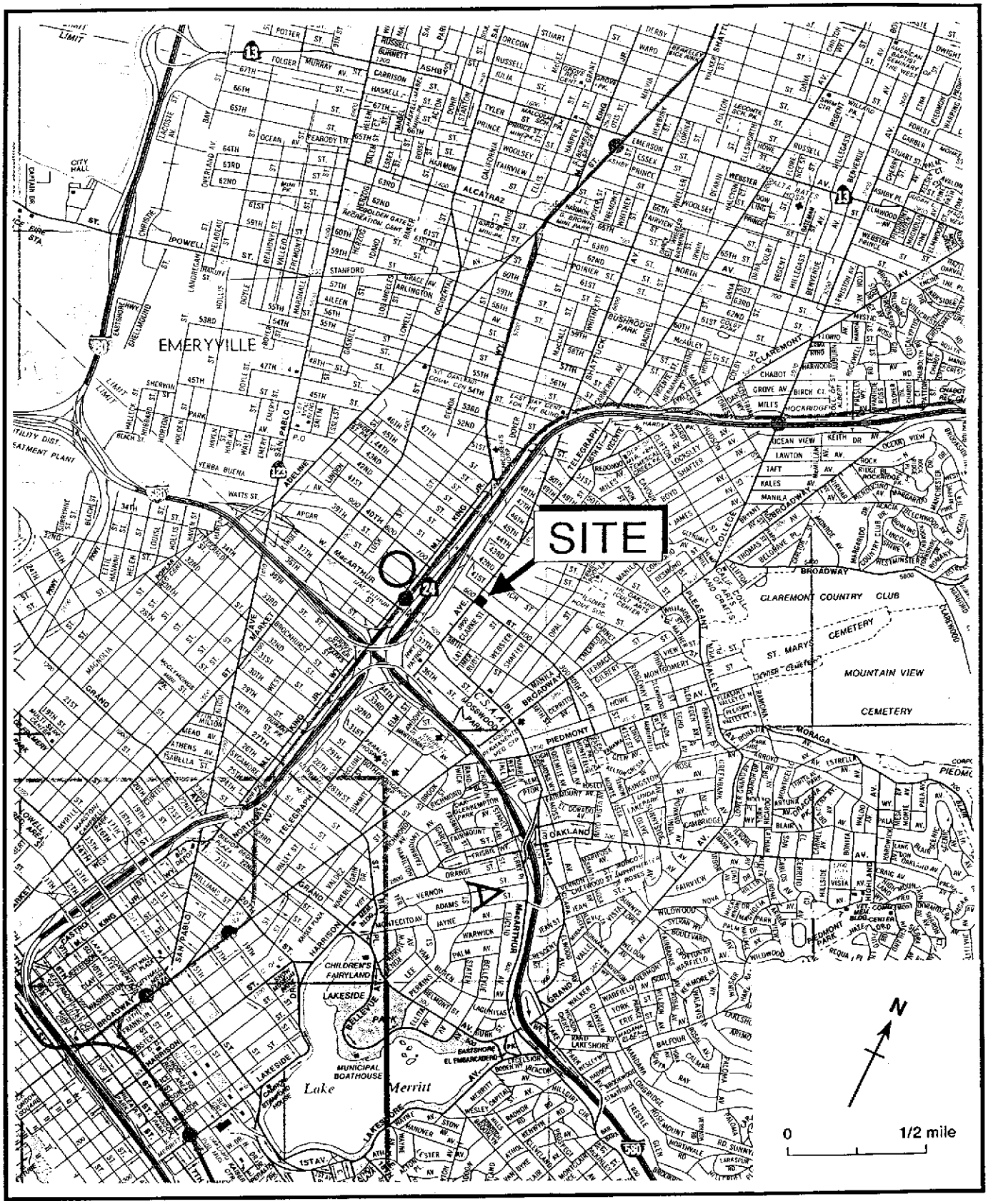

Figure 1. Site Location Map - Shell Service Station WIC #204-5508-4903, 500 40th Street, Oakland, California

2/28/92

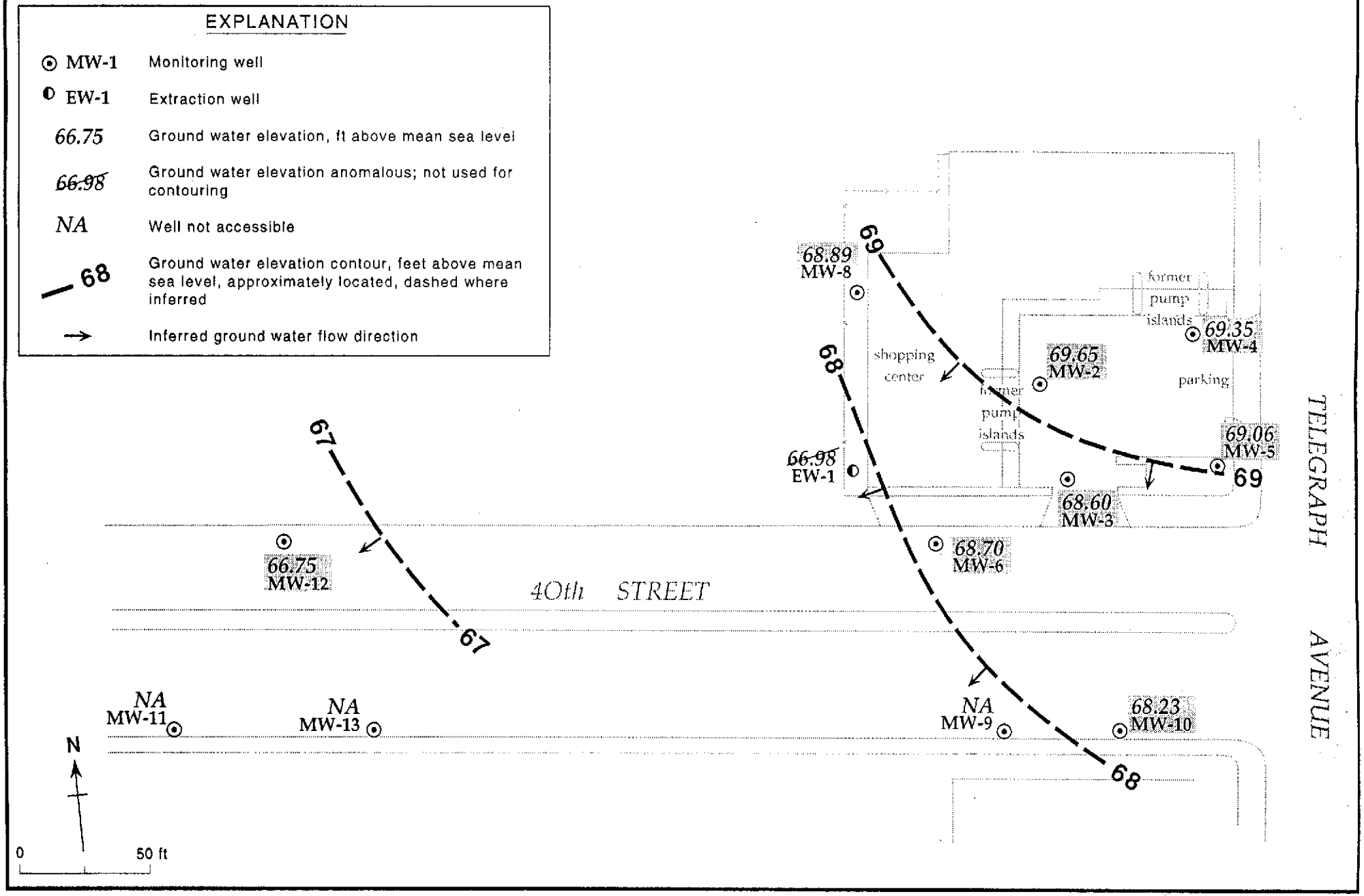

Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - February 11, 1993 - Shell Service Station, WIC #204-5508-4903, 500 40th Street, Oakland, California

Table 1. Ground Water Elevations - Shell Service Station WIC #20-4-5508-5801, 500 40th Street, Oakland, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
EW-1	08/06/91	78.26	—	—
	10/30/91		12.72	65.54
	03/18/92		11.71	66.55
	05/20/92		12.84	65.42
	08/19/92		13.04	65.22
	11/18/92		12.90	65.36
	02/11/93		11.28	66.98
MW-2	08/06/91	80.80	12.12	68.68
	10/30/91		11.70	69.10
	03/18/92		11.10	69.70
	05/20/92		12.12	68.68
	08/19/92		12.18	68.62
	11/18/92		12.03	68.77
	02/11/93		11.15	69.65
MW-3	08/06/91	79.60	11.12	68.48
	10/30/91		10.93	68.67
	03/18/92		10.54	69.06
	05/20/92		10.79	68.81
	08/19/92		11.23	68.37
	11/18/92		11.20	68.40
	02/11/93		11.00	68.60
MW-4	08/06/91	81.00	12.36	68.64
	10/30/91		12.02	68.98
	03/18/92		11.34	69.66
	05/20/92		12.35	68.65
	08/19/92		12.41	68.59
	11/18/92		12.28	68.72
	02/11/93		11.65	69.35
MW-5	08/06/91	81.50	13.02	68.48
	10/30/91		12.73	68.77
	03/18/92		12.52	68.98
	05/20/92		13.05	68.45
	08/19/92		13.04	68.46
	11/18/92		12.91	68.59
	02/11/93		12.44	69.06
MW-6	08/06/91	77.90	10.71	67.19
	10/30/91		10.50	67.40
	03/18/92		9.24	68.66
	05/20/92		10.13	67.77
	08/19/92		10.16	67.74

— Table 1 continues on next page —

Table 1. Ground Water Elevations - Shell Service Station WIC #204-5508-5801, 500 40th Street, Oakland, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	11/18/92		9.94	67.96
	02/11/93		9.20	68.70
MW-8	08/06/91	79.91	13.08	66.83
	10/30/91		12.87	67.04
	03/18/92		11.54	68.37
	05/20/92		12.32	67.59
	08/19/92		12.58	67.33
	11/18/92		12.47	67.44
	02/11/93		11.02	68.89
MW-9	08/06/91	77.71	10.38	67.33
	10/30/91		—	—
	03/18/92		8.76	68.95
	05/20/92[a]		—	—
	08/19/92		9.98	67.73
	11/18/92		9.81	67.90
	02/11/93[a]		—	—
MW-10	08/06/91	77.91	10.00	67.91
	10/31/91		10.10	67.81
	03/18/92		9.55	68.36
	05/20/92		10.41	67.50
	08/19/92		10.46	67.45
	11/18/92		10.31	67.60
	02/11/93		9.68	68.23
MW-11	11/22/91	75.76	11.90	63.86
	02/15/92[a]		—	—
	03/18/92[a]		—	—
	05/20/92[a]		—	—
	08/19/92		12.06	63.70
	11/18/92		12.01	63.75
	02/11/93[a]		—	—
MW-12	12/02/91	75.65	10.31	65.34
	03/18/92		8.93	66.72
	05/20/92		10.26	65.39
	08/19/92		10.53	65.12
	11/18/92		10.45	65.20
	02/11/93		8.90	66.75
MW-13	11/22/91	76.36	11.96	64.40
	03/18/92		10.84	65.52
	05/20/92[a]		—	—

— Table 1 continues on next page —

Table 1. Ground Water Elevations - Shell Service Station WIC #204-5508-5801, 500 40th Street, Oakland, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
	08/19/92		12.12	64.24
	11/18/92		12.00	64.42
	02/11/93[a]		—	—

Notes:

a = Inaccessible well, ground water depth not measured

Table 2. Analytical Results for Ground Water - Shell Service Station WIC #204-5508-5801, 500 40th Street, Oakland, California

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X
			<----------parts per million (mg/L)---------->					
EW-1	08/06/91	---	0.18	<0.05	0.0054	0.0009	<0.0005	0.0007
	10/30/91	12.72	0.07	<0.05	0.0026	<0.0005	<0.0005	<0.0005
	02/15/92	11.71	<0.05	---	0.0021	<0.0005	<0.0005	<0.0005
	05/22/92	12.84	0.099	---	0.0041	<0.0005	<0.0005	<0.0005
	08/19/92	13.04	0.14	---	0.0066	<0.0005	<0.0005	<0.0005
	11/18/92	12.90	0.056	---	<0.0005	<0.0005	<0.0005	<0.0005
	02/11/93	11.28	0.063	---	<0.0005	<0.0005	<0.0005	0.0009
	02/11/93[a]		0.063	---	<0.0005	<0.0005	<0.0005	0.0008
MW-2	08/07/91	12.12	1.2	0.23	0.059	0.038	0.0011	0.056
	10/30/91	11.70	0.52	0.3[b]	0.056	0.056	<0.0005	0.1
	02/15/92	11.10	2.3	2.2[b]	0.087	0.088	<0.0025	0.15
	05/21/92	12.12	0.70	---	0.024	0.034	0.0010	0.048
	08/19/92	12.18	0.74	---	0.021	0.024	<0.0025	0.026
	08/19/92[a]	12.18	0.84	---	0.031	0.036	<0.0025	0.043
	11/18/92	12.03	0.92	---	0.019	0.030	<0.0025	0.051
	11/18/92[a]	12.03	0.87	---	0.025	0.034	<0.0025	0.052
	02/11/93	11.15	1.0	---	0.025	0.043	0.006	0.073
MW-3	08/07/91	11.12	1.9	0.47	0.22	0.057	0.057	0.26
	10/30/91	10.93	1.9	0.48[b]	0.16	0.063	0.028	0.18
	02/15/92	10.54	2.3	0.78[b]	0.17	0.059	0.031	0.18
	05/21/92	10.79	1.5	---	0.16	0.044	0.020	0.14
	08/19/92	11.23	4.5	---	0.21	0.089	0.064	0.31
	11/18/92	11.20	2.4	---	0.081	0.039	0.014	0.14
	02/11/93	11.0	3.0	---	0.20	0.090	0.047	0.26
MW-4	08/07/91	12.36	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	10/30/91	12.02	0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	02/15/92	11.34	0.09	---	0.0009	<0.0005	<0.0005	<0.0005
	05/21/92	12.35	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	08/19/92	12.41	0.082[c]	---	<0.0005	<0.0005	<0.0005	<0.0005
	11/18/92	12.28	0.085[c]	---	<0.0005	<0.0005	<0.0005	<0.0005
	02/11/93	11.65	0.062[c]	---	<0.0005	<0.0005	<0.0005	<0.0005
MW-5	08/07/91	13.02	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	10/30/91	12.73	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	02/15/92	12.52	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	05/20/92	13.05	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	08/19/92	13.04	0.055[c]	---	<0.0005	<0.0005	<0.0005	<0.0005
	11/18/92	12.91	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	02/11/93	12.44	0.059[c]	---	<0.0005	<0.0005	<0.0005	<0.0005

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Table 2. Analytical Results for Ground Water - Shell Service Station WIC #204-5508-5801, 500 40th Street, Oakland, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X
			<----------parts per million (mg/L)---------->					
MW-6	08/06/91	10.71	26	3.6	0.91	0.56	0.42	1.9
	10/30/91	10.50	20	4.6	0.71	0.41	0.24	1.7
	02/15/92	9.24	35	27	0.69	0.65	0.42	3.0
	05/21/92	10.13	15	---	0.46	0.30	0.11	1.6
	08/19/92	10.16	24	---	0.60	0.46	0.30	2.0
	11/18/92	9.94	29	---	0.48	0.45	0.25	2.3
	02/11/93	9.20	24	---	1.3	0.63	0.25	2.4
MW-8	08/06/91	13.08	0.09	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	10/30/91	12.87	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	02/15/92	11.54	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	05/20/92	12.32	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	08/19/92	12.58	0.060	---	<0.0005	<0.0005	<0.0005	<0.0005
	11/18/92	12.47	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	02/11/93	11.02	0.076[c]	---	<0.0005	<0.0005	<0.0005	<0.0005
MW-9	08/06/91	10.38	3.9	0.19	0.058	0.080	0.0088	0.220
	10/30/91	---	---	---	---	---	---	---
	03/18/92	8.76	1.8[d]	0.21	0.084	0.049	0.011	0.060
	05/20/92	---	---	---	---	---	---	---
	08/19/92	9.98	4.6	0.22[b]	0.063	0.048	<0.025	0.070
	11/18/93	9.81	1.8	0.13[b]	0.030	0.046	0.0092	0.061
	02/11/93	---	---	---	---	---	---	---
MW-10	08/07/91	10.00	0.46	<0.05	0.073	0.018	0.001	0.0084
	10/31/91	10.10	0.63	0.15	0.100	0.033	<0.0005	0.026
	02/15/92	9.55	0.81	0.57[b]	0.085	0.044	0.0025	0.038
	05/21/92	10.41	0.28	---	0.047	0.0040	0.0007	0.0031
	08/19/92	10.46	0.33	---	0.035	0.0060	<0.0010	0.0041
	11/18/93	10.31	0.30	---	0.030	0.0071	0.0008	0.0063
	02/11/93	9.68	0.51[c]	---	0.049	0.018	0.0038	0.018
MW-11	11/22/91	11.90	0.45	0.24	0.0011	<0.0005	<0.0005	<0.0005
	02/15/92	---	---	---	---	---	---	---
	03/18/92	---	---	---	---	---	---	---
	05/20/92	---	---	---	---	---	---	---
	08/19/92	12.06	0.27[c]	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	11/18/92	12.01	0.40[c]	0.10	<0.0005	<0.0005	<0.0005	<0.0005
	02/11/93	---	---	---	---	---	---	---
MW-12	12/02/91	10.31	<1	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	03/18/92	8.93	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	05/20/92	10.26	0.18[c]	---	<0.0005	<0.0005	<0.0005	<0.0005
	08/19/92	10.53	0.23[c]	---	<0.0005	<0.0005	<0.0005	<0.0005

-- Table 2 continues on next page --

Table 2. Analytical Results for Ground Water - Shell Service Station WIC #204-5508-5801, 500 40th Street, Oakland, California (continued)

Well ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X
			<----------parts per million (mg/L)---------->					
	11/18/92	10.45	0.22[c]	---	<0.0005	<0.0005	<0.0005	<0.0005
	02/11/93	8.90	0.24	---	<0.0005	<0.0005	<0.0005	<0.0005
MW-13	11/22/91	11.96	0.90	1.0	0.037	0.074	0.0095	0.130
	03/18/92	10.84	9[d]	0.59[b]	0.24	0.32	0.028	0.32
	05/20/92	---	---	---	---	---	---	---
	08/19/92	12.12	7.0	0.47[b]	0.18	0.15	0.036	0.15
	11/18/92	12.00	---	---	---	---	---	---
	02/11/93	---	---	---	---	---	---	---
Field Blank	08/19/92		<0.05	---	<0.0005	<0.0005	0.0005	0.0005
	11/18/92		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
Trailer Blank	02/15/92		<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
	03/18/92		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	05/21/92		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	08/19/92		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	11/18/92		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
	02/11/93		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005
DTCS MCLs			NE	NE	0.001	0.680	0.10[e]	1.750

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
TPH-MO = Total petroleum hydrocarbons as motor oil by EPA Method 8015
B = Benzene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
T = Toluene by EPA Method 8020
X = Xylenes by EPA Method 8020
NE = Not established
DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water
--- = Not analyzed
ND = Not detected

Notes:

a = Duplicate sample
b = Concentration reported as diesel is primary due to the presence of a lighter petroleum product, possible gasoline or kerosene
c = Concentration reported as gasoline is primarily due to the presence of discrete hydrocarbon peaks not indicative of gasoline
d = Compounds detected and calculated as gasoline do not match the standard gasoline chromatographic pattern
e = DTSC recommended action level; MCL not established

Table 3. Recommended Sampling Frequency Modifications for Ground Water Monitoring Wells - Shell Service Station #WIC 204-5508-5801, 500 - 40th Street, Oakland, California

Monitoring Well	Current Sampling Frequency	Recommended Sampling Frequency	Rational for Recommended Sampling Frequency
EW-1	Quarterly	Semi-annually 2nd & 4th quarters	Intermediate well; stable hydrocarbon concentrations for at least seven consecutive quarters
MW-2	Quarterly	Semi-annually 2nd & 4th quarters	Source area well; Stable hydrocarbon concentrations for at least seven consecutive quarters
MW-3	Quarterly	Semi-annually 2nd & 4th quarters	Source area well; stable hydrocarbon concentrations for at least seven consecutive quarters
MW-4	Quarterly	Semi-annually 2nd & 4th quarters	Upgradient well; no benzene, ethylbenzene, toluene or xylenes detected for four quarters; low stable TPH-G concentrations for at least seven consecutive quarters
MW-5	Quarterly	Semi-annually 2nd & 4th quarters	Crossgradient well; no benzene, ethylbenzene; toluene or xylenes detected for seven quarters; low, stable TPH-G concentrations from at least seven consecutive quarters
MW-6	Quarterly	Semi-annually 2nd & 4th quarters	Intermediate well, stable hydrocarbon concentrations for at least seven consecutive quarters
MW-8	Quarterly	Semi-annually 2nd & 4th quarters	Crossgradient well; no hydrocarbons or low hydrocarbon concentrations detected for at least seven consecutive quarters
MW-9	Quarterly	Semi-annually 2nd & 4th quarters	Intermediate well; stable hydrocarbon concentrations for at least seven consecutive quarters
MW-10	Quarterly	Semi-annually 2nd & 4th quarters	Intermediate crossgradient well; stable hydrocarbon concentrations for at least seven consecutive quarters
MW-11	Quarterly	Quarterly	Downgradient well
MW-12	Quarterly	Quarterly	Downgradient well
MW-13	Quarterly	Semi-annually 2nd & 4th quarters	Intgermediate downgradient well

ATTACHMENT A

GROUND WATER MONITORING REPORT AND ANALYTIC REPORT

BLAINE
TECH SERVICES INC.

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

March 3, 1993

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

Attn: Daniel T. Kirk

SITE:
Shell WIC # 204-5508-4903
500 40th/Telegraph
Oakland, California

QUARTER:
1st quarter of 1993

QUARTERLY GROUNDWATER SAMPLING REPORT 930211-A-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)
EW-1 *	6	02-11-93	TOP OF PIPE	--	NONE	--	--	11.28	38.58
MW-2	4	02-11-93	TOP OF PIPE	--	NONE	--	--	11.15	19.52
MW-3	4	02-11-93	TOP OF PIPE	--	NONE	--	--	11.0	18.70
MW-4	4	02-11-93	TOP OF PIPE	--	NONE	--	--	11.65	14.95
MW-5	4	02-11-93	TOP OF PIPE	--	NONE	--	--	12.44	20.20
OMW-6	4	02-11-93	TOP OF PIPE	--	NONE	--	--	9.20	20.20
MW-8	4	02-11-93	TOP OF PIPE	--	NONE	--	--	11.02	38.78
OMW-9	--	02-11-93	INACCESSIBLE						
OMW-10	4	02-11-93	TOP OF PIPE	--	NONE	--	--	9.68	16.10
OMW-11	--	02-11-93	INACCESSIBLE						
OMW-12	4	02-11-93	TOP OF PIPE	--	NONE	--	--	8.90	19.50
OMW-13	--	02-11-93	INACCESSIBLE						

* Sample DUP was a duplicate sample taken from well EW-1.

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

The samples obtained at this site were delivered to Anametrix, Inc. in San Jose, California. Anametrix, Inc. is a California Department of Health Services certified Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1234.

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 necessary 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/kkl

attachments: chain of custody
certified analytical report

cc: Weiss Associates
5500 Shellmound St.
Emeryville, Ca 94608-2411
ATTN: Kristina Koltavary

9302 208 (18) (10/37)

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No:

Date: 2-12-93
Page 1 of 2

Site Address: 500 40th OAKLAND

WIC#: 204 5508 4903 ~~4207~~

Shell Engineer: Daniel Kirk — Phone No.: 510 — Fax #: 675 6171

Consultant Name & Address: Blaine Tech Services

Consultant Contact: Glen Bennet — Phone No.: 408 — Fax #: 995-5535

Comments:

Sampled by: Jeff Curtis

Printed Name: JEFF CURTIS

LAB: AnalytRix

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	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
(1) BW1	2/11			W		3						/							ground water	
(2) MW2	2/12					3						/								
(3) MW3	2/12					3						/								
(4) MW4	2/12					3						/								
(5) MW5	2/11					3						/								
(6) OMW6	2/11					3						/								
(7) MW8	2/11					3						/								
(8) OMW10	2/11			"		3						/								

CHECK ONE (1) BOX ONLY — C1/D1

- Quarterly Monitoring — 6441
- Site Investigation — 6441
- Soil Classify/Disposal — 6442
- Water Classify/Disposal — 6443
- Soil/Air Rem. or Sys. O & M — 6462
- Water Rem. or Sys. O & M — 6463
- Other

TURN AROUND TIME

- 24 hours
- 48 hours
- 10 days (Normal)
- Other

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

Relinquished By (signature):	Printed Name:	Date:	Received (signature):	Printed Name:	Date:
	JEFF CURTIS	Time: 1100			Time:
Relinquished By (signature):	Printed Name:	Date: 2-16-93	Received (signature):	Printed Name:	Date: 2-16-93
	BENNY S. CAMPOS	Time: 1120		BENNY S. CAMPOS	Time: 1120
Relinquished By (signature):	Printed Name:	Date:	Received (signature):	Printed Name:	Date: 2/16/93
		Time:		Maria Barajas	Time: 1120

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

9302208 (18) (10/57)

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: _____

Date: 2/2/93
Page 2 of 2

Site Address: 500 40TH OAKLAND
WIC#: 204 5508 4903
Shell Engineer: Daniel Kirk — Phone No.: 510 — Fax #: 675 6171
Consultant Name & Address: Blaine Tech Services
Consultant Contact: Glen Bennet — Phone No.: 408 — Fax #: 995-5535
Comments:
Sampled by: JeffCurtis
Printed Name: JEFF CURTIS

LAB: ANCHOR ENVIRONMENTAL

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	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
[redacted]				W								X							Ground Water	
(9) OMW12	2/11			W		3						/								
(10) DUP	2/11			W		3						/								
(11) TRIP	2/11			W		2						/								

CHECK ONE (1) BOX ONLY — C1/OF

Quarterly Monitoring	☒	8021
Site Investigation	☐	8021
Soil Closure/Disposal	☐	8412
Water Closure/Disposal	☐	8413
Soil/Air Rem. or Sys. O & M	☐	8482
Water Rem. or Sys. O & M	☐	8483
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		Printed Name	Date	Time
Relinquished by (signature):	JEFF CURTIS	2-16-93	1100	Received (signature):	BENNY S. GARCIA	2-16-93	1100
Relinquished by (signature):	BENNY S. GARCIA	2-16-93	1120	Received (signature):	Maria Burgos	2/16/93	11:20
Relinquished by (signature):				Received (signature):			

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

ANAMETRIX INC
Environmental & Analytical Chemistry

Part of Incre-ch Environmental

REPORT

MR. GLEN BENNETT
BLAINE TECH
985 TIMOTHY STREET
SAN JOSE, CA 95133

Workorder # : 9302208
Date Received : 02/16/93
Project ID : 204-5508-4903
Purchase Order: MOH-B813

The following samples were received at Anametrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9302208- 1	EW-1
9302208- 2	MW-2
9302208- 3	MW-3
9302208- 4	MW-4
9302208- 5	MW-5
9302208- 6	OMW-6
9302208- 7	MW-8
9302208- 8	OMW-10
9302208- 9	OMW-12
9302208-10	DUP
9302208-11	TRIP

This report consists of 6 pages not including the cover letter, and is organized in sections according to the specific Anametrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anametrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anametrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anametrix.

Sarah Schoen, Ph.D.
Laboratory Director

03-02-93
Date

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. GLEN BENNETT
BLAINE TECH
985 TIMOTHY STREET
SAN JOSE, CA 95133

Workorder # : 9302208
Date Received : 02/16/93
Project ID : 204-5508-4903
Purchase Order: MOH-B813
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9302208- 1	EW-1	WATER	02/11/93	TPHg/BTEX
9302208- 2	MW-2	WATER	02/12/93	TPHg/BTEX
9302208- 3	MW-3	WATER	02/12/93	TPHg/BTEX
9302208- 4	MW-4	WATER	02/12/93	TPHg/BTEX
9302208- 5	MW-5	WATER	02/11/93	TPHg/BTEX
9302208- 6	OMW-6	WATER	02/11/93	TPHg/BTEX
9302208- 7	MW-8	WATER	02/11/93	TPHg/BTEX
9302208- 8	OMW-10	WATER	02/11/93	TPHg/BTEX
9302208- 9	OMW-12	WATER	02/11/93	TPHg/BTEX
9302208-10	DUP	WATER	02/11/93	TPHg/BTEX
9302208-11	TRIP	WATER	02/11/93	TPHg/BTEX

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. GLEN BENNETT
BLAINE TECH
985 TIMOTHY STREET
SAN JOSE, CA 95133

Workorder # : 9302208
Date Received : 02/16/93
Project ID : 204-5508-4903
Purchase Order: MOH-B813
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- The concentrations reported as gasoline for samples MW-4, MW-5 and MW-8 are primarily due to the presence of a discrete hydrocarbon peak not indicative of gasoline.
- The concentration reported as gasoline for sample OMW-10 is primarily due to the presence of discrete hydrocarbon peaks not indicative of gasoline.

Cheryl Bulmer 3/2/93
Department Supervisor Date

Peggie Davison 3/2/93
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9302208
Matrix : WATER
Date Sampled : 02/11/93

Project Number : 204-5508-4903
Date Released : 03/02/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# EW-1 -01	Sample I.D.# MW-2 -02	Sample I.D.# MW-3 -03	Sample I.D.# MW-4 -04	Sample I.D.# MW-5 -05
Benzene	0.5	ND	25	200	ND	ND
Toluene	0.5	ND	6.0	47	ND	ND
Ethylbenzene	0.5	ND	43	90	ND	ND
Total Xylenes	0.5	0.9	73	260	ND	ND
TPH as Gasoline	50	63	1000	3000	62	59
% Surrogate Recovery		127%	96%	105%	86%	122%
Instrument I.D.		HP4	HP4	HP4	HP4	HP4
Date Analyzed		02/19/93	02/20/93	02/22/93	02/19/93	02/19/93
RLMF		1	2	10	1	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Reggie Davison 3/2/93
Analyst Date

Cheryl Belmer 3/2/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9302208
Matrix : WATER
Date Sampled : 02/11/93

Project Number : 204-5508-4903
Date Released : 03/02/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# OMW-6 -06	Sample I.D.# OMW-8 -07	Sample I.D.# OMW-10 -08	Sample I.D.# OMW-12 -09	Sample I.D.# DUP -10
Benzene	0.5	1300	ND	49	ND	ND
Toluene	0.5	250	ND	3.8	ND	ND
Ethylbenzene	0.5	630	ND	18	ND	ND
Total Xylenes	0.5	2400	ND	18	ND	0.8
TPH as Gasoline	50	24000	76	510	240	63
% Surrogate Recovery		80%	118%	102%	88%	120%
Instrument I.D.		HP4	HP4	HP4	HP4	HP4
Date Analyzed		02/19/93	02/19/93	02/19/93	02/19/93	02/19/93
RLMF		100	1	2	1	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Reggie Davison 3/2/93
Analyst Date

Cheryl Bedmen 3/2/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9302208
Matrix : WATER
Date Sampled : 02/11/93

Project Number : 204-5508-4903
Date Released : 03/02/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# TRIP -11	Sample I.D.# BF1902E2 BLANK	Sample I.D.# BF2201E2 BLANK
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND
% Surrogate Recovery		120%	127%	128%
Instrument I.D.		HP4	HP4	HP4
Date Analyzed		02/19/93	02/19/93	02/22/93
RLMF		1	1	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Reggie Davison 3/2/93
Analyst Date

Cheryl Balmer 3/2/93
Supervisor Date

BTEX LABORATORY CONTROL SAMPLE REPORT
EPA METHOD 5030 WITH GC/PID
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: LAB CONTROL SAMPLE	Anametrix I.D.	: LCSW0219
Matrix	: WATER	Analyst	: RD
Date Sampled	: N/A	Supervisor	:
Date Analyzed	: 02/19/93	Date Released	: 03/02/93
		Instrument ID	: HP4

COMPOUND	SPIKE AMT. (ug/L)	LCS (ug/L)	REC LCS	%REC LIMITS
Benzene	20.0	22.0	110%	52-133
Toluene	20.0	23.7	119%	57-136
Ethylbenzene	20.0	23.2	116%	56-139
TOTAL Xylenes	20.0	22.7	114%	56-141
P-BFB			87%	61-139

* Limits established by Anametrix, Inc.

ATTACHMENT B
SAMPLING FREQUENCY MODIFICATION CRITERIA

SAMPLING FREQUENCY CRITERIA

Weiss Associates (WA) has developed a technical approach for determining appropriate ground water monitoring well sampling frequencies for service station monitoring programs. Ground water monitoring wells are typically sampled quarterly at service stations to monitor the concentration and extent of hydrocarbons and/or volatile organic compounds (VOCs) in ground water. This satisfies California Regional Water Quality Control Board (RWQCB) ground water monitoring guidelines which state: "Quarterly (ground water) monitoring is the maximum sampling interval typically allowed when ground water contamination is present unless other arrangements are made with Regional (Water Quality Control) Board staff"[1]. San Francisco Bay RWQCB personnel have indicated that the RWQCB will allow well sampling frequency reductions on a site specific basis if the frequency reductions are justified by site conditions. Presented below are generalized criteria we have developed for determining the appropriate well sampling frequencies based on specific site conditions.

CRITERIA FOR REDUCING SAMPLING FREQUENCY

The generalized criteria we have developed for determining whether sampling frequency should be modified for a given well includes:

- The reliability of the ground water analytic data,
- The trend of the dissolved hydrocarbon and/or VOCs concentrations in the well, and
- The location of the well in relation to the hydrocarbon and/or VOCs source.

Each of these factors is discussed below.

Reliability of Ground Water Analytic Data

The reproducibility of ground water analytic data is highly sensitive to geologic conditions, ground water elevations, field sampling procedures and laboratory analytic procedures. Of these controlling factors, ground water fluctuations usually have the greatest impact on data reproducibility. Since ground water elevations at most sites fluctuate during

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[1] North Coast, San Francisco Bay, Central Valley Regional Water Quality Control Boards, June 2, 1988 (revised May 18, 1989), "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks; pg. 12

the course of a year, ground water should be monitored for at least one year to assess the impact of ground water fluctuations on data reproducibility. RWQCB guidelines also stipulate sampling all monitoring wells at least quarterly for one year when hydrocarbons are detected in the well. Therefore, WA recommends reducing the sampling frequency only for wells which:

- Have been sampled at least four times over a period of one year, and
- Have consistent historic analytic results allowing a reliable assessment of the representative hydrocarbon concentrations in the ground water.

Although it may be possible to statistically quantify the reliability of the analytic data, this effort may not produce useful results. Therefore, we will evaluate the reliability of the data subjectively. If the variability of the analytic data prevents a reliable assessment of concentrations then we recommend sampling the well(s) quarterly until a reliable assessment can be made.

Concentration Trends

Sampling frequency should be reduced only for wells showing stable or decreasing concentration trends. Wells showing increasing concentration trends should be sampled quarterly to monitor the trends and determine whether the hydrocarbon concentration in a particular well is approaching a threshold, such as the saturation concentration, maximum contaminant level (MCL) or the recommended action level.

Well Location

For most sites, four to ten ground water monitoring wells are typically required to fully define the extent of hydrocarbons in ground water. These wells generally fall into one of four classifications relative to the hydrocarbon source:

1) Clean upgradient and crossgradient wells,
2) Source-area wells with high hydrocarbon concentrations,
3) Intermediate wells with low to high hydrocarbon concentrations located between the source-area wells and clean crossgradient and downgradient wells, and
4) Clean downgradient wells.

WA's recommended sampling frequency for each of these classifications is as follows:

1) If no hydrocarbons are detected in the upgradient and crossgradient wells, and if no offsite sources are suspected upgradient or crossgradient of the site, WA recommends sampling these wells annually.

2) Source-area wells are used to monitor concentrations from source-area releases and determine effectiveness of natural biodegradation and/or site remediation. To ensure that increasing source-area concentration trends are detected, WA recommends sampling these wells biannually.

3) Intermediate wells are used to track dissolved hydrocarbon concentrations and the rates of natural biodegradation or the effectiveness of site remediation. Therefore, WA recommends sampling these wells biannually. However, if there are more than four intermediate wells, we recommend sampling each of the intermediate wells annually during different quarters.

4) Since clean downgradient wells define the "leading edge" of dissolved hydrocarbons in ground water and are used to determine hydrocarbon breakthrough, WA recommends sampling these wells quarterly.

Other Considerations

If hydrocarbon concentrations in ground water from all site wells are near or below MCLs, we recommend sampling all site wells biannually or annually, depending on the number of wells, well locations with respect to potential source areas, and ground water depth fluctuations. Annual sampling should be sufficient for sites with:

- Large numbers of wells,
- Wells located immediately downgradient of potential source areas, and
- Stable ground water depths.

Sites without these characteristics may need biannual sampling.

Upgradient and/or crossgradient wells that contain hydrocarbons or other contaminants from offsite sources should be sampled biannually to monitor offsite contributions of contaminants to the site.

A decision flow chart graphically presenting the recommended sampling frequency based on these criteria is included as Figure 1. Although there may be wells that do not fall into the location and concentration classifications listed in the flow chart, the generalized criteria may be used to evaluate the appropriate sampling frequency on a case by case basis.

SUMMARY

In summary, WA recommends reducing sampling frequencies for all ground water monitoring wells with:

- Ground water samples collected for four consecutive quarters,
- Reliable ground water analytic results, and
- No significantly increasing concentration trends.

The sampling frequency for individual wells should be modified based on the well location relative to the contaminant source, as follows:

- Annually for clean upgradient and crossgradient wells,
- Biannually for upgradient and crossgradient wells containing hydrocarbons or other contaminants from an offsite, upgradient source,
- Biannually for high concentration source-area wells,
- Biannually or annually for intermediate wells, depending on the total number of intermediate wells, and
- Quarterly for clean downgradient wells.

Sampling frequency in all site wells should also be reduced to biannual or annual if contaminant concentrations in all site wells are near or below MCLs.

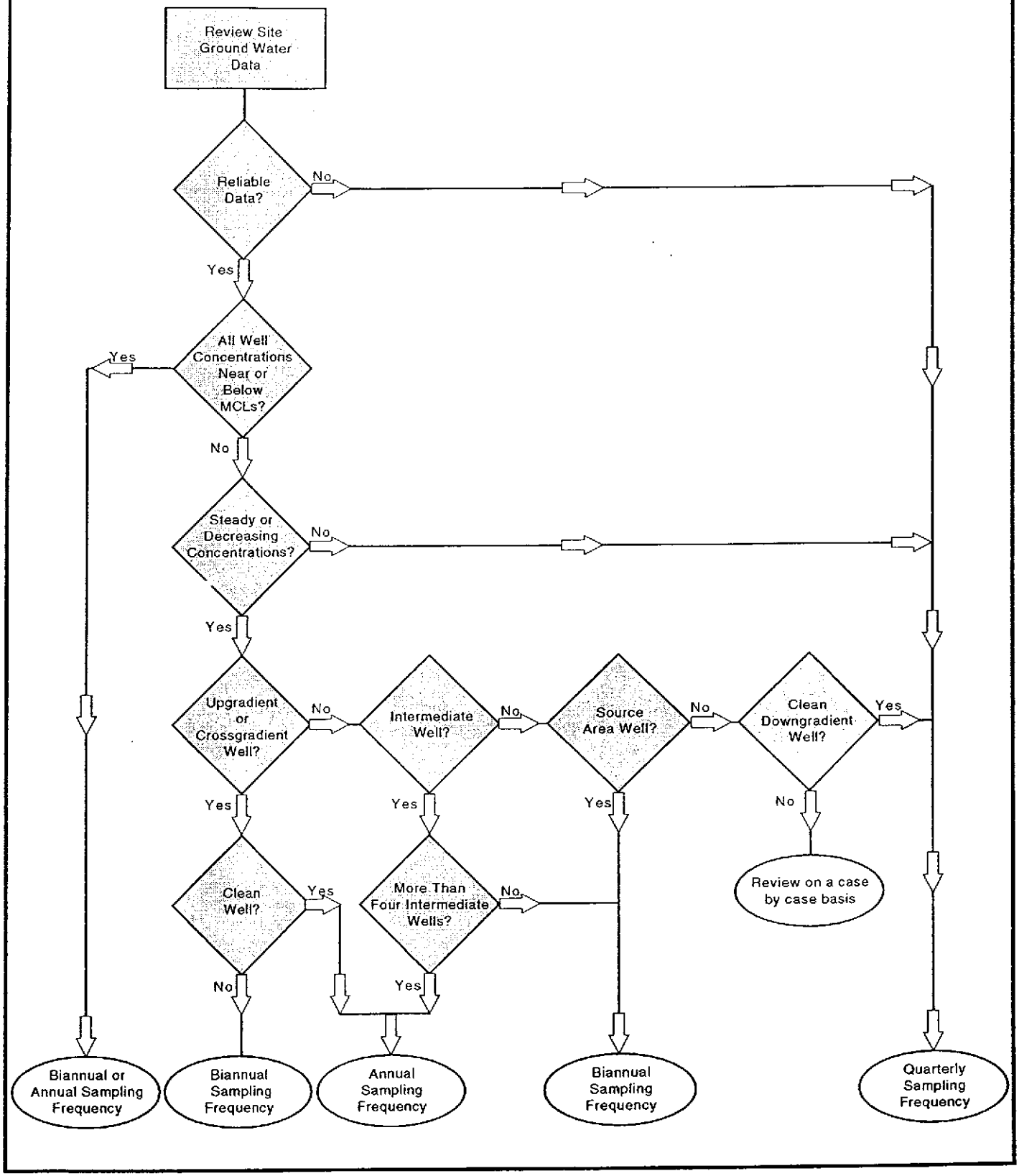

Figure 1. Ground Water Sampling Frequency Determination Chart