RO 867

Weiss Associates Environmental and Geologic Services

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

93 FEB 11 PM 3:02

February 2, 1993

#86

Barney Chan
Alameda County Department of
Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621-1426

Re: Shell Service Station
WIC #204-5508-2709
3750 East 14th Street
Oakland, California
WA Job #81-425-203

Dear Mr. Chan:

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 fourth quarter 1992 and proposed work for the first quarter 1993.

Fourth Quarter 1992 Activities:

- EMCON Associates (EMCON) of San Jose, California measured depths to ground water and collected ground water samples from the four site wells. EMCON's report describing these activities and presenting analytic results for ground water is included as Attachment A.

- Weiss Associates (WA) used EMCON's ground water elevation calculations to prepare a ground water elevation contour map (Figure 2).

- Since no purgeable halocarbons were detected for five consecutive quarters, WA discontinued analyzing ground water from monitoring well MW-1 for these compounds.

- 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 and (Figure 3). Our specific recommendations for this site are presented in Table 1. WA will implement these well sampling frequencies unless we are notified otherwise within 60 days.

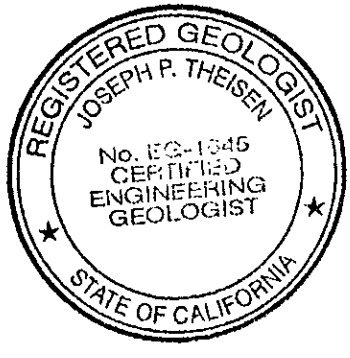
Anticipated First Quarter 1993 Activities:

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

- Since no purgeable halocarbons have been detected for four consecutive quarters, we will no longer analyze ground water from MW-2 for purgeable halocarbons by EPA Method 601.

- Unless we receive comments or suggestions within 60 days of this report submittal, sampling frequency modifications will be implemented during the first quarter 1993 sampling event.

Please call if you have any questions.



Sincerely,
Weiss Associates

J. Michael Asport
Technical Assistant

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

JMA/JPT:jma

J:\SHELL\425\425QMJA3.WP

Attachments: Figures
Table
A - EMCON's Ground Water Monitoring Report
B - Sampling Frequency Criteria

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

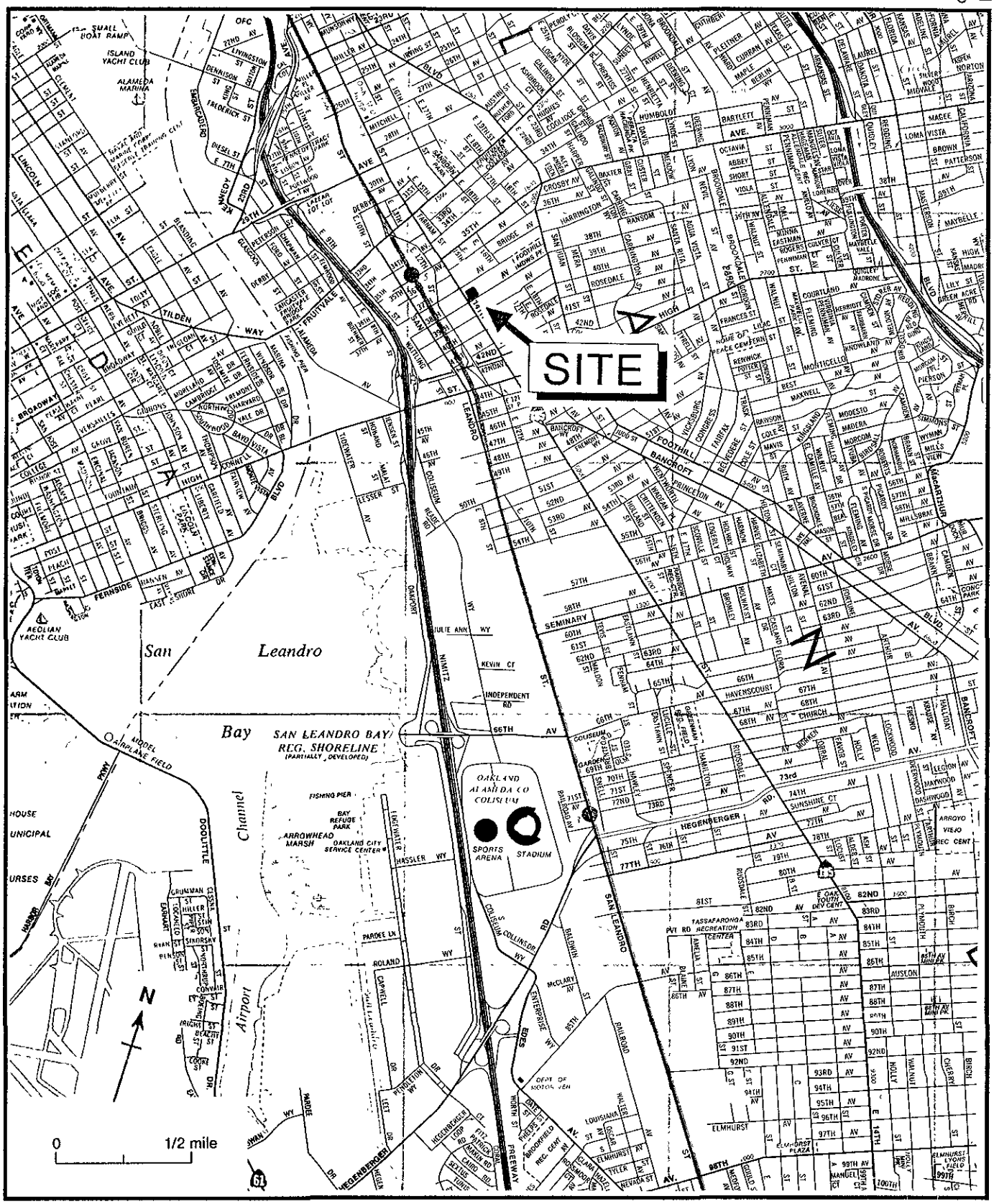
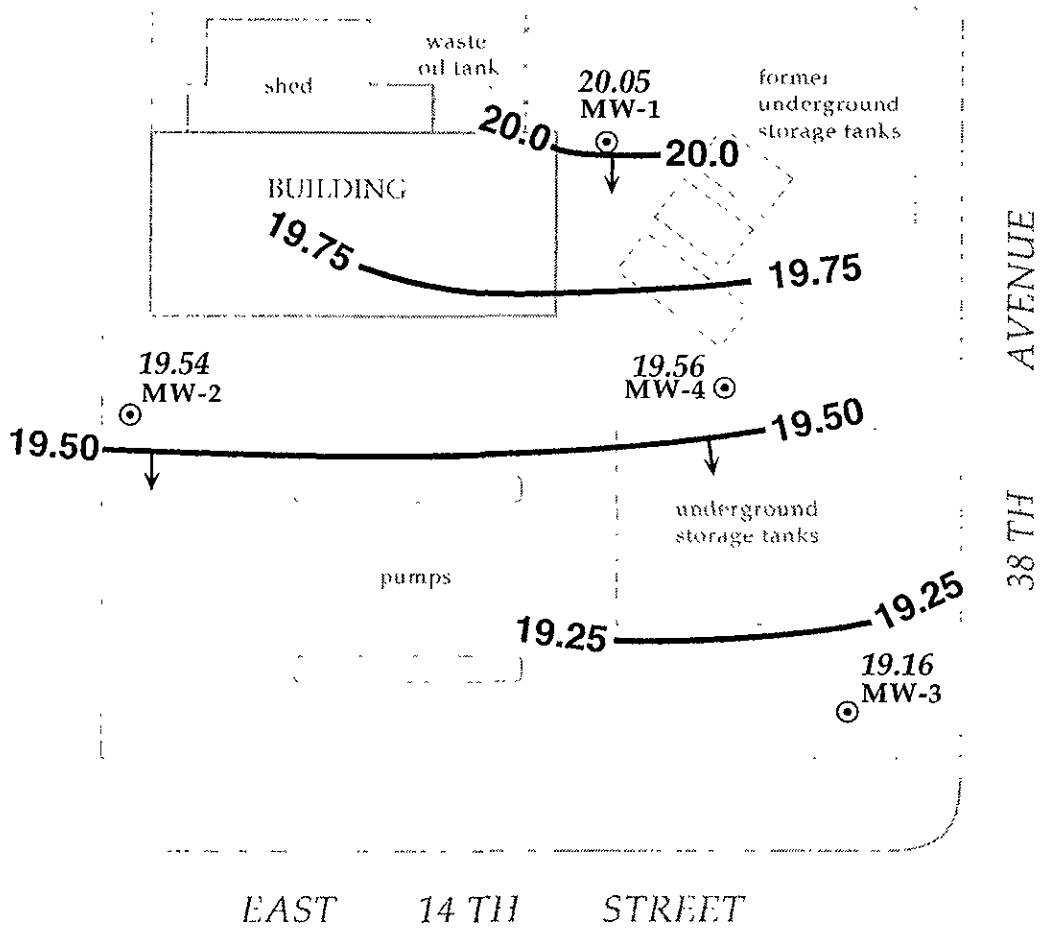
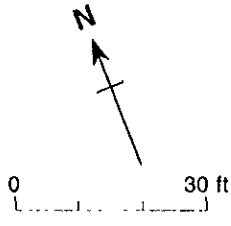


Figure 1. Site Location Map - Shell Service Station WIC #204-5508-2709, 3750 East 14th Street, Oakland, California





EXPLANATION

⊙ MW-1	Existing monitoring well
20.05	Ground water elevation, feet above mean sea level
19.50	Ground water elevation contour, approximately located
→	Inferred ground water flow direction

Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - October 6, 1992 - Shell Service Station WIC #204-5508-2709, 3750 East 14th Street, Oakland, California

1/26/93

Table 1. Recommended Ground Water Sampling Frequency - Former Shell Service Station, WIC #204-5508-2709, 3750 East 14th Street, Oakland, California

Well ID	Current Sampling Frequency	Recommended Future Sampling Frequency	Rationale for Recommended Sampling Frequency
MW-1	Quarterly	Annually (4th Qtr)	Clean upgradient well
MW-2	Biannually	Annually (4th Qtr)	Clean crosss gradient well
MW-3	Quarterly	Quarterly	Downgradient well
MW-4	Quarterly	Quarterly	Intermediate well, will re-evaluate after next quarter

ATTACHMENT A

GROUND WATER MONITORING REPORT AND ANALYTIC REPORT

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

November 12, 1992
Project: 0G67-033.01
WIC#: 204-5508-2709

Mr. David Elias
Weiss Associates
5500 Shellmound Street
Emeryville, California 94608-2411

Re: Fourth quarter 1992 ground-water monitoring report, Shell Oil Company, 3750 East 14th Street, Oakland, California

Dear Mr. Elias:

This letter presents the results of the fourth quarter 1992 ground-water monitoring event for the Shell Oil Company (Shell) site located at 3750 East 14th Street, Oakland, California (figure 1). Fourth quarter monitoring was conducted on October 6, 1992. The site is monitored quarterly. Well MW-2 is sampled semiannually in second and fourth quarters; wells MW-1, MW-3, and MW-4 are sampled quarterly.

GROUND-WATER LEVEL SURVEY

A water-level survey preceded the purging and sampling of the monitoring wells. The wells included in the survey are identified in figure 2 (supplied by Weiss Associates). During the survey, wells MW-1, MW-2, MW-3, and MW-4 were measured for depth to water, floating product thickness, and total depth. Depth to water and floating product thickness were measured to the nearest 0.01 foot with an oil/water interface probe. No floating product was observed in any wells. Total depth was measured to the nearest 0.1 foot. Results of the fourth quarter water-level survey, and available data from four previous surveys, are summarized in table 1.

SAMPLING AND ANALYSIS

Ground-water samples were collected from wells MW-1, MW-2, MW-3, and MW-4 on October 6, 1992. Prior to sample collection, the wells were purged with polyvinyl chloride bailers. During the purging operation, ground water was monitored for pH, electrical conductivity, and temperature as a function of volume of water removed. Purging continued until these parameters were stable and a minimum of three casing volumes of ground water were removed. Field measurements from fourth quarter monitoring, and available measurements from four previous monitoring events, are summarized in table 1. Purge water from the monitoring

1938 Junction Avenue, San Jose, California 95131-2102, (408) 453-0719, Fax (408) 453-0452

wells was contained in 55-gallon drums. The drums were identified with Shell-approved labels and secured for on-site storage.

Ground-water samples were collected with a Teflon® bailer, labeled, placed on ice, and transported to Anametrix Inc. for analysis. Shell chain-of-custody documents accompanied all samples to the laboratory.

All equipment that was placed down a well or that came in contact with ground water was steam cleaned with deionized water prior to use at each well.

Quality control samples for fourth quarter monitoring included a trip blank (TB), and a field blank (FB), and a duplicate well sample (MW-4D) collected from well MW-4. All water samples collected during fourth quarter monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPH-g), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Additional ground-water samples collected from well MW-3 were analyzed for total petroleum hydrocarbons as diesel (TPH-d). Additional ground-water samples collected from well MW-2 were analyzed for halogenated volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) method 601.

ANALYTICAL RESULTS

Analytical results for the fourth quarter 1992 monitoring event, and available results from four previous monitoring events, are summarized in table 2 (TPH-g, BTEX, and TPH-d) and table 3 (VOCs). The original certified analytical report and final chain-of-custody document are attached.

If you have any questions, please call.

Very truly yours,

EMCON Associates

David Larsen
Environmental Sampling Coordinator

Orrin Childs
Environmental Sampling Supervisor

DL/OC:dl

Attachments: Table 1 - Monitoring well field measurement data
Table 2 - Summary of analytical results (TPH-g, BTEX, and TPH-d)
Table 3 - Summary of analytical results (VOCs)
Figure 1 - Site location map
Figure 2 - Monitoring well locations
Certified analytical report
Chain-of-custody document

Table 1
Monitoring Well Field Measurement Data
Fourth Quarter 1992

Shell Station: 3750 East 14th Street
Oakland, California
WIC #: 204-5508-2709

Date: 11/12/92
Project Number: G67-33.01

Well Designation	Water Level Field Date	TOC Elevation (ft-MSL)	Depth to Water (feet)	Groundwater Elevation (ft-MSL)	Total Well Depth (feet)	Floating Product Thickness (feet)	Water Sample Field Date	pH (std. units)	Electrical Conductivity (micromhos/cm)	Temperature (degrees F)	Turbidity (NTU)
MW-1	10/23/91	34.67	14.52	20.15	NR	NR	10/23/91	NR	NR	NR	NR
MW-1	01/24/92	34.67	12.33	22.34	26.3	ND	01/24/92	7.10	697	62.3	>200
MW-1	04/28/92	34.67	9.18	25.49	26.3	ND	04/28/92	7.00	885	67.5	>200
MW-1	07/02/92	34.67	12.10	22.57	26.3	ND	07/02/92	6.82	654	68.3	>200
MW-1	10/06/92	34.67	14.62	20.05	26.3	ND	10/06/92	7.04	720	70.3	136
MW-2	10/23/91	34.75	15.03	19.72	NR	NR	10/23/91	NR	NR	NR	NR
MW-2	01/24/92	34.75	12.86	21.89	28.0	ND	01/24/92	6.98	693	60.9	>200
MW-2	04/28/92	34.75	9.56	25.19	28.0	ND	04/28/92	7.18	974	65.3	>200
MW-2	07/02/92	34.75	13.70	21.05	28.2	ND	07/02/92	NA	NA	NA	NA
MW-2	10/06/92	34.75	15.21	19.54	28.0	ND	10/06/92	7.24	776	68.5	743
MW-3	10/23/91	33.12	13.79	19.33	NR	NR	10/23/91	NR	NR	NR	NR
MW-3	01/24/92	33.12	11.58	21.54	27.8	ND	01/24/92	6.95	724	61.0	>200
MW-3	04/28/92	33.12	8.55	24.57	27.8	ND	04/28/92	7.09	1018	66.1	>200
MW-3	07/02/92	33.12	11.30	21.82	28.8	ND	07/02/92	6.73	735	71.3	>200
MW-3	10/06/92	33.12	13.96	19.16	27.7	ND	10/06/92	6.96	812	73.7	173
MW-4	07/02/92	33.99	11.90	22.09	24.9	ND	07/02/92	6.90	737	71.8	>200
MW-4	10/06/92	33.99	14.43	19.56	24.4	ND	10/06/92	7.32	778	72.8	170

TOC = top of casing
ft-MSL = elevation in feet, relative to mean sea level
std. units = standard pH units
micromhos/cm = micromhos per centimeter
degrees F = degrees Fahrenheit
NTU = nephelometric turbidity units
NR = Not reported; data not available
ND = None detected
NA = Not analyzed

Table 2
Summary of Analytical Results
Fourth Quarter 1992
milligrams per liter (mg/l) or parts per million (ppm)

Shell Station: 3750 East 14th Street
Oakland, California
WIC #: 204-5508-2709

Date: 11/12/92
Project Number: G67-33.01

Sample Designation	Water Sample Field Date	TPH-g (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl-benzene (mg/l)	Total Xylenes (mg/l)	TPH-d (mg/l)
MW-1	10/23/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-1	01/24/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-1	04/28/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-1	07/02/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-1	10/06/92	<0.05	<0.0005	0.0025	0.0016	0.0044	NA
MW-2	10/23/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-2	01/24/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-2	04/28/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-2	07/02/92	NA	NA	NA	NA	NA	NA
MW-2	10/06/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-3	10/23/91	0.80	0.0056	0.0007	<0.0005	0.0046	0.57&
MW-3	01/24/92	1.3	0.0023	0.0023	0.0038	0.0052	0.83
MW-3	04/28/92	0.52&	0.0006	0.0009	0.0012	0.0034	0.30&
MW-3	07/02/92	1.5	0.039	0.0073	0.0020	0.018	0.21*
MW-3	10/06/92	0.95	<0.0005	0.029	0.016	0.037	0.12*
MW-4	07/02/92	0.58	0.021	<0.0005	0.029	0.0063	NA
MW-4	10/06/92	0.098	0.0029	0.0007	0.0042	0.0091	NA
MW-4D	10/06/92	0.17	0.0022	0.0006	0.0038	0.012	NA
FB	07/02/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
FB	10/06/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA

TPH-g = total petroleum hydrocarbons as gasoline
TPH-d = total petroleum hydrocarbons as diesel
NA = Not analyzed
& = Results due primarily to low boiling hydrocarbons
* = Concentration reported as diesel is primarily due to the presence of a lighter petroleum product, possibly gasoline or kerosene

Table 2
Summary of Analytical Results
Fourth Quarter 1992
milligrams per liter (mg/l) or parts per million (ppm)

Shell Station: 3750 East 14th Street
Oakland, California
WIC #: 204-5508-2709

Date: 11/12/92
Project Number: G67-33.01

Sample Designation	Water Sample Field Date	TPH-g (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl-benzene (mg/l)	Total Xylenes (mg/l)	TPH-d (mg/l)
TB	10/23/91	NR	NR	NR	NR	NR	NR
TB	01/24/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
TB	04/28/92	NA	NA	NA	NA	NA	NA
TB	07/02/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
TB	10/06/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA

TPH-g = total petroleum hydrocarbons as gasoline
TPH-d = total petroleum hydrocarbons as diesel
NR = Not reported; data not available
NA = Not analyzed

Table 3
Summary of Analytical Results
Volatile Organic Compounds by EPA Method 601
Fourth Quarter 1992
milligrams per liter (mg/l) or parts per million (ppm)

Shell Station: 3750 East 14th Street
Oakland, California
WIC #: 204-5508-2709

Date: 11/12/92
Project Number: G67-33.01

Sample Designation	Water Sample Field Date	TCE (mg/l)	TCA (mg/l)
MW-1	10/23/91	<0.0005	<0.0005
MW-1	01/24/92	<0.0005	<0.0005
MW-1	04/28/92	<0.0005	<0.0005
MW-1	07/02/92	NA	NA
MW-1	10/06/92	NA	NA
MW-2	10/23/91	<0.0005	<0.0005
MW-2	01/24/92	<0.0005	<0.0005
MW-2	04/28/92	<0.0005	<0.0005
MW-2	07/02/92	NA	NA
MW-2	10/06/92	<0.0005	<0.0005

TCE = Trichloroethene
TCA = 1,1,1-Trichloroethane
NA = Not analyzed

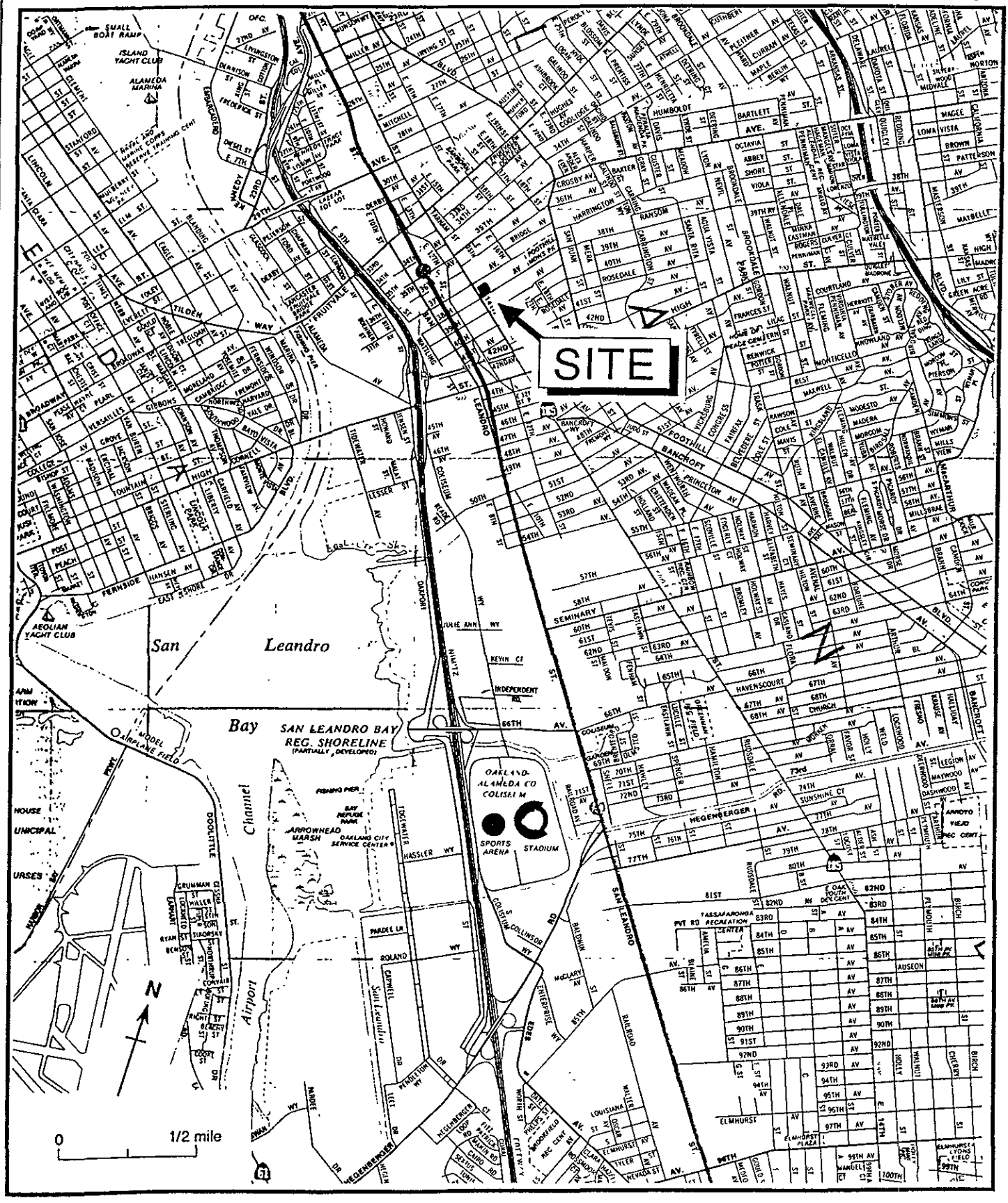
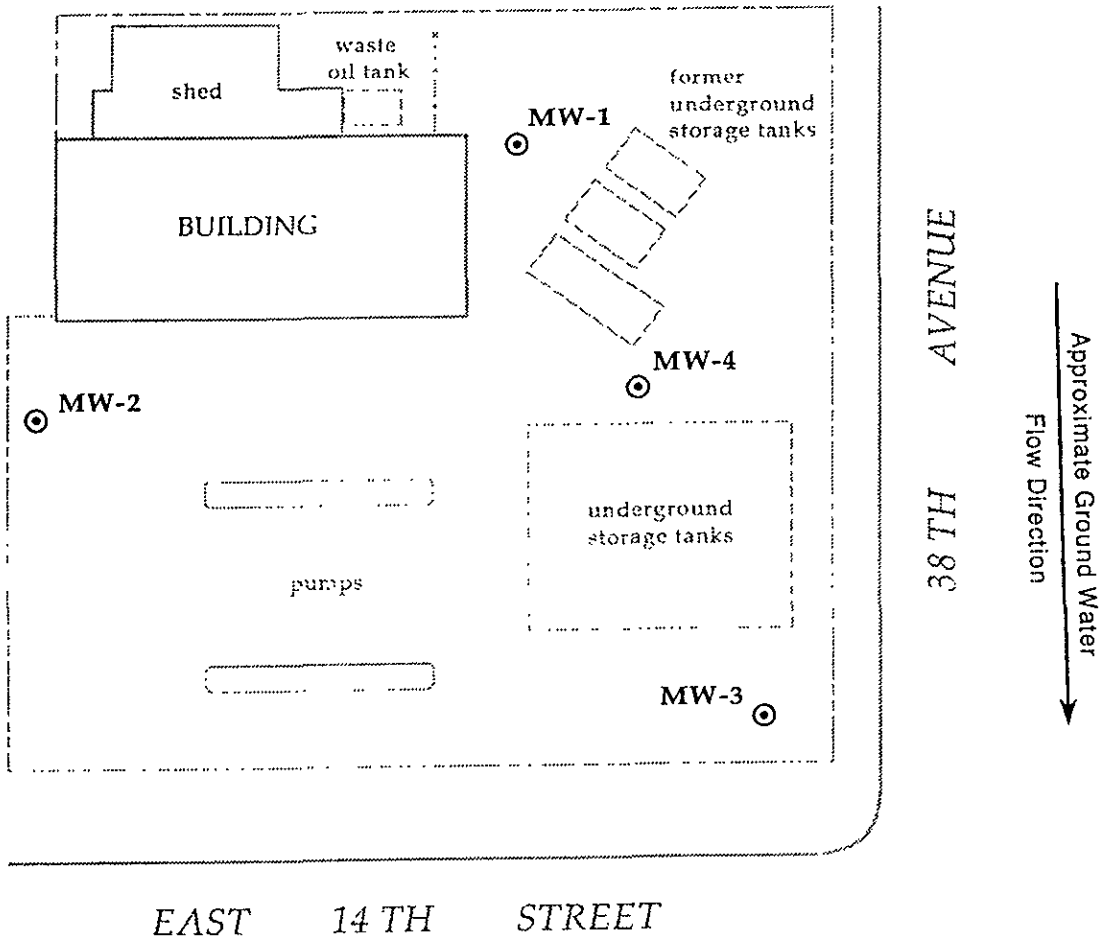
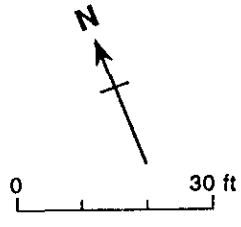


Figure 1. Site Location Map
Shell Service Station WIC #204-5508-2709
3750 East 14th Street, Oakland, California

3/30/90





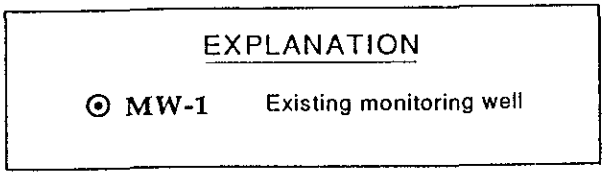


Figure 2. Monitoring Well Locations - Shell Service Station WIC #204-5508-2709, 3750 East 14th Street, Oakland, California

ANAMETRIX INC
Environmental & Analytical Chemistry

Part of INCHCAPE ENVIRONMENTAL

REPORT

MR. DAVID LARSEN
EMCON ASSOCIATES
1938 JUNCTION AVE.
SAN JOSE, CA 95131

Workorder # : 9210081
Date Received : 10/06/92
Project ID : 204-5508-2709
Purchase Order: MOH-B813

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

ANAMETRIX ID	CLIENT SAMPLE ID
9210081- 1	MW-1
9210081- 2	MW-2
9210081- 3	MW-4
9210081- 4	MW-3
9210081- 5	MW-4D
9210081- 6	TB
9210081- 7	FB

This report consists of 14 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

10-19-92
Date

ANAMETRIX REPORT DESCRIPTION
GC

Organic Analysis Data Sheets (OADS)

OADS forms contain tabulated results for target compounds. The OADS are grouped by method and, within each method, organized sequentially in order of increasing Anametrix ID number.

Surrogate Recovery Summary (SRS)

SRS forms contain quality assurance data. An SRS form will be printed for each method, if the method requires surrogate compounds. They will list surrogate percent recoveries for all samples and any method blanks. Any surrogate recovery outside the established limits will be flagged with an "*", and the total number of surrogates outside the limits will be listed in the column labelled "Total Out".

Matrix Spike Recovery Form (MSR)

MSR forms contain quality assurance data. They summarize percent recovery and relative percent difference information for matrix spikes and matrix spike duplicates. This information is a statement of both accuracy and precision. Any percent recovery or relative percent difference outside established limits will be flagged with an "*", and the total number outside the limits will be listed at the bottom of the page. Not all reports will contain an MSR form.

Qualifiers

Anametrix uses several data qualifiers (Q) in it's report forms. These qualifiers give additional information on the compounds reported. They should help a data reviewer to verify the integrity of the analytical results. The following is a list of qualifiers and their meanings:

- U - Indicates that the compound was analyzed for, but was not detected at or above the specified reporting limit.
- B - Indicates that the compound was detected in the associated method blank.
- J - Indicates that the compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value. Tentatively identified compounds will always have a "J" qualifier because they are not included in the instrument calibration.
- E - Indicates that the amount reported exceeded the linear range of the instrument calibration.
- D - Indicates that the compound was detected in an analysis performed at a secondary dilution.

Absence of a qualifier indicates that the compound was detected at a concentration at or above the specified reporting limit.

REPORTING CONVENTIONS

- Due to a size limitation in our data processing step, only the first eight (8) characters of your project ID and sample ID will be printed on the report forms. However, the report cover letter and report summary pages display up to twenty (20) characters of your project and sample IDs.
- Amounts reported are gross values, i.e., not corrected for method blank contamination.

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

MR. DAVID LARSEN
EMCON ASSOCIATES
1938 JUNCTION AVE.
SAN JOSE, CA 95131

Workorder # : 9210081
Date Received : 10/06/92
Project ID : 204-5508-2709
Purchase Order: MOH-B813
Department : GC
Sub-Department: VOA

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9210081- 2	MW-2	WATER	10/06/92	601

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

MR. DAVID LARSEN
EMCON ASSOCIATES
1938 JUNCTION AVE.
SAN JOSE, CA 95131

Workorder # : 9210081
Date Received : 10/06/92
Project ID : 204-5508-2709
Purchase Order: MOH-B813
Department : GC
Sub-Department: VOA

QA/QC SUMMARY :

- No QA/QC problems encountered for sample.

Corinne Kham 10/14/92
Department Supervisor Date

Kamel G. Kamel 10/14/92
Chemist Date

DESCRIPTIONS FOR SPECIFIC COMPOUNDS ANALYZED
EPA METHOD 601/8010

CAS #	COMPOUND NAME	ABBREVIATED NAME
74-87-3	Chloromethane	Chloromethane
74-83-9	Bromomethane	Bromoethane
75-71-8	Dichlorodifluoromethane	Freon 12
75-01-4	Vinyl Chloride	Vinyl Chloride
75-00-3	Chloroethane	Chloroethane
75-09-2	Methylene Chloride	Methylene Chlor
75-69-4	Trichlrofluoromethane	Freon 11
75-35-4	1,1-Dichloroethene	1,1-DCE
75-34-3	1,1-Dichloroethane	1,1-DCA
156-59-2	Cis-1,2-Dichloroethene	Cis-1,2-DCE
156-60-5	Trans-1,2-Dichloroethene	Trans-1,2-DCE
67-66-3	Chloroform	Chloroform
76-13-1	Trichlorotrifluoroethane	Freon 113
107-06-2	1,2-Dichloroethane	1,2-DCA
71-55-6	1,1,1-Trichloroethane	1,1,1-TCA
56-23-5	Carbon Tetrachloride	Carbon Tet
75-27-4	Bromodichloromethane	BromodichloroMe
78-87-5	1,2-Dichloropropane	1,2-DCPA
10061-02-6	Trans-1,3-Dichloropropene	Trans-1,3-DCPE
79-01-6	Trichloroethene	TCE
124-48-1	Dibromochloromethane	DibromochloroMe
79-00-5	1,1,2-Trichloroethane	1,1,2-TCA
10061-01-5	Cis-1,3-Dichloropropene	Cis-1,3-DCPE
110-75-8	2-Chloroethylvinylether	Chloroethylvinl
75-25-2	Bromoform	Bromoform
127-18-4	Tetrachloroethene	PCE
79-34-5	1,1,2,2-Tetrachloroethane	PCA
108-90-7	Chlorobenzene	Chlorobenzene
95-50-1	1,2-Dichlorobenzene	1,2-DCB
541-73-1	1,3-Dichlorobenzene	1,3-DCB
106-46-7	1,4-Dichlorobenzene	1,4-DCB
352-33-0	p-Chlorofluorobenzene	Chlorofluoroben

mh/3426 - 10MH

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 601/8010
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 204-5508-2709 MW-2
Matrix : WATER
Date sampled : 10/06/92
Date analyzed: 10/09/92
Dilution : NONE

Anametrix I.D. : 9210081-02
Analyst : KK
Supervisor : CS
Date released : 10/14/92
Instrument ID : HP14

CAS #	Compound Name	Reporting Limit (mg/L)	Amount Found (mg/L)
74-87-3	* Chloromethane	0.001	ND
74-83-9	* Bromomethane	0.0005	ND
75-71-8	* Dichlorodifluoromethane	0.001	ND
75-01-4	* Vinyl Chloride	0.0005	ND
75-00-3	* Chloroethane	0.0005	ND
75-09-2	* Methylene Chloride	0.0005	ND
75-69-4	* Trichlorofluoromethane	0.0005	ND
75-35-4	* 1,1-Dichloroethene	0.0005	ND
75-34-3	* 1,1-Dichloroethane	0.0005	ND
156-59-2	# Cis-1,2-Dichloroethene	0.0005	ND
156-60-5	* Trans-1,2-Dichloroethene	0.0005	ND
67-66-3	* Chloroform	0.0005	ND
76-13-1	# Trichlorotrifluoroethane	0.0005	ND
107-06-2	* 1,2-Dichloroethane	0.0005	ND
71-55-6	* 1,1,1-Trichloroethane	0.0005	ND
56-23-5	* Carbon Tetrachloride	0.0005	ND
75-27-4	* Bromodichloromethane	0.0005	ND
78-87-5	* 1,2-Dichloropropane	0.0005	ND
10061-02-6	* Trans-1,3-Dichloropropene	0.0005	ND
79-01-6	* Trichloroethene	0.0005	ND
124-48-1	* Dibromochloromethane	0.0005	ND
79-00-5	* 1,1,2-Trichloroethane	0.0005	ND
10061-01-5	* cis-1,3-Dichloropropene	0.0005	ND
110-75-8	* 2-Chloroethylvinylether	0.001	ND
75-25-2	* Bromoform	0.0005	ND
127-18-4	* Tetrachloroethene	0.0005	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	0.0005	ND
108-90-7	* Chlorobenzene	0.0005	ND
95-50-1	* 1,2-Dichlorobenzene	0.001	ND
541-73-1	* 1,3-Dichlorobenzene	0.001	ND
106-46-7	* 1,4-Dichlorobenzene	0.001	ND
	% Surrogate Recovery	51-136%	84%

ND : Not detected at or above the practical quantitation limit for the method.
* A 601/8010 approved compound (Federal Register, 10/26/84).
# A compound added by Anametrix, Inc.

ORGANIC ANALYSIS DATA SHEET - EPA METHOD 601/8010
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: VBLANK	Anametrix I.D.	: 14B1009H01
Matrix	: WATER	Analyst	: KK
Date sampled	: N/A	Supervisor	: CP
Date analyzed	: 10/09/92	Date released	: 10/14/92
Dilution	: NONE	Instrument ID	: HP14

CAS #	Compound Name	Reporting Limit (mg/L)	Amount Found (mg/L)
74-87-3	* Chloromethane	0.001	ND
74-83-9	* Bromomethane	0.0005	ND
75-71-8	* Dichlorodifluoromethane	0.001	ND
75-01-4	* Vinyl Chloride	0.0005	ND
75-00-3	* Chloroethane	0.0005	ND
75-09-2	* Methylene Chloride	0.0005	ND
75-69-4	* Trichlorofluoromethane	0.0005	ND
75-35-4	* 1,1-Dichloroethene	0.0005	ND
75-34-3	* 1,1-Dichloroethane	0.0005	ND
156-59-2	# Cis-1,2-Dichloroethene	0.0005	ND
156-60-5	* Trans-1,2-Dichloroethene	0.0005	ND
67-66-3	* Chloroform	0.0005	ND
76-13-1	# Trichlorotrifluoroethane	0.0005	ND
107-06-2	* 1,2-Dichloroethane	0.0005	ND
71-55-6	* 1,1,1-Trichloroethane	0.0005	ND
56-23-5	* Carbon Tetrachloride	0.0005	ND
75-27-4	* Bromodichloromethane	0.0005	ND
78-87-5	* 1,2-Dichloropropane	0.0005	ND
10061-02-6	* Trans-1,3-Dichloropropene	0.0005	ND
79-01-6	* Trichloroethene	0.0005	ND
124-48-1	* Dibromochloromethane	0.0005	ND
79-00-5	* 1,1,2-Trichloroethane	0.0005	ND
10061-01-5	* cis-1,3-Dichloropropene	0.0005	ND
110-75-8	* 2-Chloroethylvinylether	0.001	ND
75-25-2	* Bromoform	0.0005	ND
127-18-4	* Tetrachloroethene	0.0005	ND
79-34-5	* 1,1,2,2-Tetrachloroethane	0.0005	ND
108-90-7	* Chlorobenzene	0.0005	ND
95-50-1	* 1,2-Dichlorobenzene	0.001	ND
541-73-1	* 1,3-Dichlorobenzene	0.001	ND
106-46-7	* 1,4-Dichlorobenzene	0.001	ND
	% Surrogate Recovery	51-136%	92%

ND : Not detected at or above the practical quantitation limit for the method.
* A 601/8010 approved compound (Federal Register, 10/26/84).
\# A compound added by Anametrix, Inc.

LABORATORY CONTROL SAMPLE
EPA METHOD 601/8010
ANAMETRIX, INC. (408)432-8192

Project/Case	: LABORATORY CONTROL SAMPLE	Anametrix I.D.	: WO100992
Matrix	: WATER	Analyst	: KK
SDG/Batch	: N/A	Supervisor	: CP
Date analyzed	: 10/09/92	Instrument I.D.	: HP14

COMPOUND	SPIKE AMOUNT (ug/L)	AMOUNT RECOVERED (ug/L)	PERCENT RECOVERY	%RECOVERY LIMITS
FREON 113	10	8.9	89%	34 - 128
1,1-DICHLOROETHENE	10	9.4	94%	63 - 133
trans-1,2-DICHLOROETHENE	10	8.6	86%	55 - 145
1,1-DICHLOROETHANE	10	8.8	88%	49 - 121
cis-1,2-DICHLOROETHENE	10	12.2	122%	66 - 168
1,1,1-TRICHLOROETHANE	10	10.1	101%	72 - 143
TRICHLOROETHENE	10	10.1	101%	63 - 147
TETRACHLOROETHENE	10	9.5	95%	60 - 133
CHLOROBENZENE	10	11.8	118%	70 - 148
1,3-DICHLOROBENZENE	10	7.7	77%	49 - 139
1,4-DICHLOROBENZENE	10	9.8	98%	70 - 133
1,2-DICHLOROBENZENE	10	9.5	95%	69 - 140

* Limits based on data generated by Anametrix, Inc., August, 1992.

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

MR. DAVID LARSEN
EMCON ASSOCIATES
1938 JUNCTION AVE.
SAN JOSE, CA 95131

Workorder # : 9210081
Date Received : 10/06/92
Project ID : 204-5508-2709
Purchase Order: MOH-B813
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9210081- 4	MW-3	WATER	10/06/92	TPHd
9210081- 1	MW-1	WATER	10/06/92	TPHg/BTEX
9210081- 2	MW-2	WATER	10/06/92	TPHg/BTEX
9210081- 3	MW-4	WATER	10/06/92	TPHg/BTEX
9210081- 4	MW-3	WATER	10/06/92	TPHg/BTEX
9210081- 5	MW-4D	WATER	10/06/92	TPHg/BTEX
9210081- 6	TB	WATER	09/30/92	TPHg/BTEX
9210081- 7	FB	WATER	10/06/92	TPHg/BTEX

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

MR. DAVID LARSEN
EMCON ASSOCIATES
1938 JUNCTION AVE.
SAN JOSE, CA 95131

Workorder # : 9210081
Date Received : 10/06/92
Project ID : 204-5508-2709
Purchase Order: MOH-B813
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- The concentration in sample MW-3 reported as diesel is primarily due to the presence of a lighter petroleum product, possibly gasoline or kerosene.

Cheryl Bradman 10/19/92
Department Supervisor Date

Steve Sims 10/19/92
Chemist Date

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

Anametrix W.O.: 9210081
Matrix : WATER
Date Sampled : 10/06/92

Project Number : 204-5508-2709
Date Released : 10/16/92

	Reporting Limit	Sample I.D.# MW-1	Sample I.D.# MW-2	Sample I.D.# MW-4	Sample I.D.# MW-3	Sample I.D.# MW-4D
COMPOUNDS	(mg/L)	-01	-02	-03	-04	-05
Benzene	0.0005	ND	ND	0.0029	ND	0.0022
Toluene	0.0005	0.0025	ND	0.0007	0.029	0.0006
Ethylbenzene	0.0005	0.0016	ND	0.0042	0.016	0.0038
Total Xylenes	0.0005	0.0044	ND	0.0091	0.037	0.012
TPH as Gasoline	0.050	ND	ND	0.098	0.95	0.17
% Surrogate Recovery		86%	86%	90%	108%	102%
Instrument I.D.		HP4	HP4	HP4	HP4	HP4
Date Analyzed		10/10/92	10/10/92	10/10/92	10/12/92	10/09/92
RLMF		1	1	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 53-147%.

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

Steve Jones 10/19/92
Analyst Date

Cheryl Balmer 10/19/92
Supervisor Date

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

Anametrix W.O.: 9210081
Matrix : WATER
Date Sampled : 09/30 & 10/06/92

Project Number : 204-5508-2709
Date Released : 10/16/92

COMPOUNDS	Reporting Limit (mg/L)	Sample I.D.# TB -06	Sample I.D.# FB -07	Sample I.D.# BO0903E3 BLANK	Sample I.D.# BO1202E3 BLANK
Benzene	0.0005	ND	ND	ND	ND
Toluene	0.0005	ND	ND	ND	ND
Ethylbenzene	0.0005	ND	ND	ND	ND
Total Xylenes	0.0005	ND	ND	ND	ND
TPH as Gasoline	0.050	ND	ND	ND	ND
% Surrogate Recovery		86%	121%	103%	89%
Instrument I.D.		HP4	HP4	HP4	HP4
Date Analyzed		10/09/92	10/09/92	10/09/92	10/12/92
RLMF		1	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 53-147%.

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

Analyst 10/19/92 Date

Supervisor 10/19/92 Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS AS DIESEL
ANAMETRIX, INC. (408) 432-8192

Anametrix W.O.: 9210081
Matrix : WATER
Date Sampled : 10/06/92
Date Extracted: 10/12/92

Project Number : 204-5508-2709
Date Released : 10/16/92
Instrument I.D.: HP23

Anametrix I.D.	Client I.D.	Date Analyzed	Reporting Limit (mg/L)	Amount Found (mg/L)
9210081-04	MW-3	10/13/92	0.050	0.12
DWBL101292	METHOD BLANK	10/13/92	0.050	ND

Note : Reporting limit is obtained by multiplying the dilution factor times 0.050 mg/L.
ND - Not detected at or above the practical quantitation limit for the method.
TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following sample extraction by EPA Method 3510.

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

Analyst 10/19/92 Date

Supervisor 10/19/92 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.	: LCSW1009
Matrix	: WATER	Analyst	:
Date Sampled	: N/A	Supervisor	:
Date Analyzed	: 10/09/92	Date Released	: 10/19/92
		Instrument ID	: HP4

COMPOUND	SPIKE AMT. (mg/L)	LCS (mg/L)	REC LCS	%REC LIMITS
Benzene	0.020	0.021	105%	49-159
Toluene	0.020	0.021	105%	53-156
Ethylbenzene	0.020	0.020	100%	54-151
TOTAL-Xylenes	0.020	0.020	100%	56-157
P-BFB			79%	53-147

* Limits established by Anametrix, Inc.

TOTAL EXTRACTABLE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT
EPA METHOD 3510 WITH GC/FID
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE
Matrix : WATER
Date Sampled : N/A
Date Extracted: 10/12/92
Date Analyzed : 10/13/92

Anametrix I.D. : LCSW1012
Analyst : [illegible]
Supervisor : [illegible]
Date Released : 10/19/92
Instrument I.D.: HP23

COMPOUND	SPIKE AMT (mg/L)	LCS REC (mg/L)	% REC LCS	LCSD REC (mg/L)	% REC LCSD	RPD	% REC LIMITS
DIESEL	1.25	0.94	75%	1.00	80%	6%	63-130

*Quality control established by Anametrix, Inc.

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: 1136-C

Date: 10-6-92
Page 1 of 1

Site Address: 3750 East 14th Street, Oakland, CA

WIC#: 204-5508-2709

Shell Engineer: Dan Kirk — **Phone No.:** (510) 675-6168

Consultant Name & Address: EMCON Associates, 1938 Junction Avenue, San Jose, CA 95131

Consultant Contact: David Larsen — **Phone No.:** (408) 453-2269

Comments: 3-VOAs (HCl) for gas, BTEX
2-Liter Glass (SR) for diesel

Sampled by: 3-VOAs (NP) for 601
B. Stafford / M. Allen

Printed Name: Bart Stafford

LAB: Anametrix

CHECK ONE (1) BOX ONLY	CT/DT	TURN AROUND TIME
Quarterly Monitoring	X 6441	24 hours ☐
Site Investigation	☐ 6441	48 hours ☐
Soil Classify/Disposal	☐ 6442	16 days ☒ (Normal)
Water Classify/Disposal	☐ 6443	Other ☐
Soil/Air Rem. or Sys. O & M	☐ 6452	NOTE: Notify Lab as soon as Possible of 24/48 hrs. TAT.
Water Rem. or Sys. O & M	☐ 6453	
Other	☐	

Analysis Required

	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 gasoline	EPA method 601	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
1	MW-1	10-6-92			X		3						X			40 ml	HCl	No		
2	MW-2						~~6~~							X						
3	MW-4						3													
4	MW-3						5		X											
5	MW-4D	↓					3													
6	TB	9-30-92					3													
7	FB	10-6-92			↓		3						↓			↓	↓	↓		

	Printed Name	Date	Time	Received (signature)	Printed Name	Date	Time
Relinquished By (signature): Bart Stafford	Bart Stafford	10-6-92	17:50	Maria Bargas	Maria Bargas	10/6/92	17:00
Relinquished By (signature):							
Relinquished By (signature):							

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

Rev 8/92

Shell Oil Chain of Custody

EMCON Associates - Ground Water Sampling and Analysis Request Form

PROJECT NAME : **SHELL OIL COMPANY**
3750 East 14th Street, Oakland, CA

WIC#: 204-5508-2709
MOH#: MOH-90649
EMCON Project # : 0G67-033.01

DATE SUBMITTED : **06-Oct-92**

Authorized By: _____
Date: _____

SPECIAL INSTRUCTIONS / CONSIDERATIONS :
Quarterly Monitoring - First Month of the Quarter

Perform a water level survey prior to sampling (see Shell SOP).
Well survey points are top of well casings.
Survey and sample the wells in the order listed below.

The wells have dedicated PVC bailers; steam clean them before use.
You can use your own bailers to purge if you prefer; just put the dedicated bailers back when you are done.
Well boxes require a 15/16" socket to open.

Submit samples to Anametrix for analysis.

Well MW-2 is sampled semiannually in second and fourth quarters (April and October) beginning third quarter 1992.

Lead Consultant: Weiss Associates
Lead Contact: David Elias
Phone Number: (510) 547-5420
Report Due: 9-Nov-92

Shell Engineer: Dan Kirk
Phone Number: (510) 675-6168

Site Contact: _____

Site Phone#: _____

Well Locks: 2357

Well ID or Source	Casing Diameter (inches)	Casing Length (feet)	Floating Product (feet)	Scheduled Purging Equipment	Analyses Requested
MW-1	4.0	26.4	ND	PVC Bailer†	**TPH-Gasoline, BTEX**
MW-2	4.0	28.2	ND	PVC Bailer†	3 -VOAs (HCl)
MW-4	4.0	25.0	ND	PVC Bailer	
MW-3	4.0	27.9	ND	PVC Bailer†	
Above wells in indicated order					**Field Measurements:**
MW-4D	[Duplicate - Well MW-4; 3-VOAs (HCl)]				**pH, EC, Temp., Turbidity (NTU)**
TB	[Trip Blank; 3-VOAs (HCl)]				(Measure NTU at casing volume intervals; not a stabilization parameter)
FB	[Field Blank; 3-VOAs (HCl)]				
MW-3	See Above				**Also Add:** **TPH-Diesel** 2-Liter Glass (SR)
MW-2	See Above				**EPA Method 601** 3 -VOAs (NP)

Completed 10-6-92
Submitted 10-6-92
PAPS

Laboratory Instructions:

Anametrix Reference #: _____

Detection Limits: TPH-G = 0.05 ppm
BTEX = 0.0005 ppm
TPH-D = 0.05 ppm

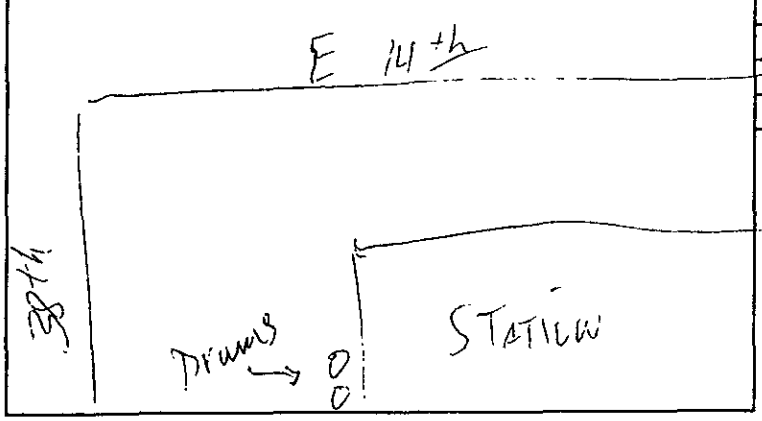
ND = None Detected IP = Intermitent Product † = Dedicated * Field Filtered

EMCON Associates - Drum Inventory Record

0G67-033.01	3750 E. 14th Street, Oakland, CA	10-6-92
Project No	Location	Date
Shell Oil Company	MA/BS	Tues
Client	Sampler	Day of Week

DRUM NUMBER OR ID	WELL OR SOURCE ID(s)	TYPE OF MATERIAL	AMOUNT OF MATERIAL IN DRUM	DATE ACCUMULATED OR GENERATED
7171	MW-1 MW-3 MW-2	groundwater purge water	60 gal	10-6-92
7172	MW-3 MW-4	groundwater	40 gal.	10-6-92

Sketch locations of drums, include drum ID's



COMMENTS:

Number of Drums From This Event: 2

Total Number of Drums At Site: 2

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G67-033.01 STATION ADDRESS : 3750 E. 14th Street, Oakland, CA DATE : 12-6-92

Shell WIC #: 204-5508-2709 FIELD TECHNICIAN : M. Adler / B. Stafford DAY : Tuesday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-1	ok	Yes	ok	2357	Yes	14.62	14.62	ND	ND	26.3	☆
2	MW-2	ok	Yes	ok	2357	Yes	15.21	15.21	ND	ND	28.0	
4	MW-3	ok	Yes	ok	2357	Yes	13.98	13.95	ND	ND	27.7	
3	MW-4	ok	Yes	ok	2357	Yes	14.43	14.43	ND	ND	24.4	
	☆ –	Water in C	Box.									

WELL SURVEY POINTS ARE TOP OF WELL CASINGS (TOC)

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 06-67-033.01 SAMPLE ID: MW-1

PURGED BY: M Adler CLIENT NAME: 204-5508-2709

SAMPLED BY: M Adler LOCATION: 3750 E 14th St. Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 7.6

DEPTH TO WATER (feet): 14.62 CALCULATED PURGE (gal.): 22.89

DEPTH OF WELL (feet): 26.3 ACTUAL PURGE VOL. (gal.): 24.0

DATE PURGED: 10-6-92 Start (2400 Hr) 1405 End (2400 Hr) 1426

DATE SAMPLED: 10-6-92 Start (2400 Hr) 1428 End (2400 Hr) 1430

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1408	8.0	6.74	630	72.1	TAN	148
1419	16.0	7.09	708	69.6	TAN	163
1426	24.0	7.04	720	70.3	TAN	136

D. O. (ppm): NR ODOR: NONE

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): 136

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NO

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: 2357

REMARKS: ___

Meter Calibration: Date: 10-6-92 Time: 1354 Meter Serial #: 9113 Temperature °F: 94.3

(EC 1000 954 / 1000) (DI 39.4) (pH 7 6.97 / 7.00) (pH 10 9.93 / 10.00) (pH 4 4.02 / ___)

Location of previous calibration: NA

Signature: M Adler Reviewed By: DCG Page 1 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OG67-033.01 SAMPLE ID: MW-2

PURGED BY: B. Stafford CLIENT NAME: ZD4-5508-2789

SAMPLED BY: B. Stafford LOCATION: 3750 E. 14th St. Oakland, CA

TYPE: Ground Water b Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 b 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL): N/K VOLUME IN CASING (gal.): 8.3

DEPTH TO WATER (feet): 15.21 CALCULATED PURGE (gal.): 25.0

12.79 DEPTH OF WELL (feet): 28.0 ACTUAL PURGE VOL. (gal.): 25.0

DATE PURGED: 10-6-92 Start (2400 Hr) 13:58 End (2400 Hr) 14:22

DATE SAMPLED: 10-6-92 Start (2400 Hr) 14:29 End (2400 Hr) 14:36

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
14:05	8.0	6.15	704.	72.6	Brown	348.
14:13	16.0	7.15	775.	68.9	b	717.
14:22	25.0	7.24	776.	68.5	↓	743.

D. O. (ppm): NA ODOR: None

NA (COBALT 0 - 100) 743 (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NA

PURGING EQUIPMENT			SAMPLING EQUIPMENT		
____ 2" Bladder Pump	____ Bailer (Teflon®)	3 (NP VOAs +3 VOAs HCl)	____ 2" Bladder Pump	X Bailer (Teflon®)	
____ Centrifugal Pump	X Bailer (PVC)		____ DDL Sampler	____ Bailer (Stainless Steel)	
____ Submersible Pump	____ Bailer (Stainless Steel)		____ Dipper	____ Submersible Pump	
____ Well Wizard™	____ Dedicated		____ Well Wizard™	____ Dedicated	
Other: ____			Other: ____		

WELL INTEGRITY: OK LOCK #: 2357

REMARKS: ____

Meter Calibration: Date: 10-6-92 Time: 1354 Meter Serial #: 9113 Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: [signature] Page 2 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0667-033.01 SAMPLE ID: MW-3

PURGED BY: MAdler CLIENT NAME: 204-5508-2709

SAMPLED BY: MAdler LOCATION: 3750 E. 14th St. Oakland, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 8.96

DEPTH TO WATER (feet): 13.96 CALCULATED PURGE (gal.): 27.0

13.79 DEPTH OF WELL (feet): 27.7 ACTUAL PURGE VOL. (gal.): 27.0

DATE PURGED: 10-6-92 Start (2400 Hr) 1444 End (2400 Hr) 1509

DATE SAMPLED: 10-6-92 Start (2400 Hr) 1511 End (2400 Hr) 1521

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1452	9.0	7.04	847	73.4	TAN	175
1501	18.0	6.87	857	74.4	TAN	102
1509	27.0	6.96	812	73.7	TAN	123

D. O. (ppm): NR ODOR: Strong NR (COBALT 0 - 100) 173 (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): FB

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: 2357

REMARKS: ___

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: ___

Signature: for M. Adler Reviewed By: DCS Page 3 of 4

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0667-033.01 SAMPLE ID: MW-4

PURGED BY: B. Stafford CLIENT NAME: 204-5508.2709

SAMPLED BY: ↓ LOCATION: 3750 E. 14th St. Oakland, CA

TYPE: Ground Water X Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 X 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.5

DEPTH TO WATER (feet): 14.43 CALCULATED PURGE (gal.): 19.5

9.97 DEPTH OF WELL (feet): 24.4 ACTUAL PURGE VOL. (gal.): 20.0

DATE PURGED: 10-6-92 Start (2400 Hr) 1450 End (2400 Hr) 1518

DATE SAMPLED: ↓ Start (2400 Hr) 1520 End (2400 Hr) 1528

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1500	6.5	7.16	790.	73.6	Brown	192.
1508	13.0	7.41	782.	72.7	↓	191
1516	20.0	7.32	778.	72.8	↓	170

D. O. (ppm): NA ODOR: none NA (COBALT 0 - 100) 170 (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): MW-4D

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon®)	____ 2" Bladder Pump	X Bailer (Teflon®)
____ Centrifugal Pump	X Bailer (PVC)	____ DDL Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: OK LOCK #: 2357

REMARKS: ____

Meter Calibration: Date: 10-6-92 Time: 1354 Meter Serial #: 9113 Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: MW-1

Signature: Brent Stafford Reviewed By: [illegible] Page 4 of 4

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: 1136-C

Date: 10-6-92
Page 1 of 1

Site Address: 3750 East 14th Street, Oakland, CA

WIC#: 204-5508-2709

Shell Engineer: Dan Kirk
Phone No.: (510) 675-6168

Consultant Name & Address: EMCON Associates, 1938 Junction Avenue, San Jose, CA 95131

Consultant Contact: David Larsen
Phone No.: (408) 453-2269

Comments: 3-VOAs (HCl) for gas, BTEX
2-Liter Glass (SR) for diesel
3-VOAs (NP) for 601

Sampled by: B. Stafford / M. Hallen

Printed Name: Bart Stafford

LAB: Anametrix

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 gasoline	EPA method 601		Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
1 MW-1	10-6-92			X		3						X				40 ml	HCl	No		
2 MW-2						6							X							
3 MW-4						3														
4 MW-3						5		X												
5 MW-4D	↓					3														
6 TB	9-30-92					3														
7 FB	10-6-92			↓		3						↓				↓	↓	↓		

CHECK ONE (1) BOX ONLY | CT/DT | TURN AROUND TIME

- Quarterly Monitoring [X] 6441
- Site Investigation [ ] 6441
- Soil Classify/Disposal [ ] 6442
- Water Classify/Disposal [ ] 6443
- Soil/Air Rem. or Sys. O & M [ ] 6452
- Water Rem. or Sys. O & M [ ] 6453
- Other [ ]

TURN AROUND TIME
- 24 hours [ ]
- 48 hours [ ]
- 15 days [X] (Non
- Other [ ]

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

Relinquished By (signature): Bart Stafford	Printed Name: Bart Stafford	Date: 10-6-92	Received (signature): Maria Bargas	Printed Name: Maria Bargas	Date: 10/6
Relinquished By (signature):	Printed Name:	Time: 17:50	Received (signature):	Printed Name:	Time: 17:1
Relinquished By (signature):	Printed Name:	Date:	Received (signature):	Printed Name:	Date:
		Time:			Time:
		Date:			Date:
		Time:			Time:

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

ATTACHMENT B

SAMPLING FREQUENCY 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[2]. 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

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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

[2] - Personal communication between Joseph Theisen, WA Project Geologist and Diane White, RWQCB-SFBR, November 29, 1989.

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 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.

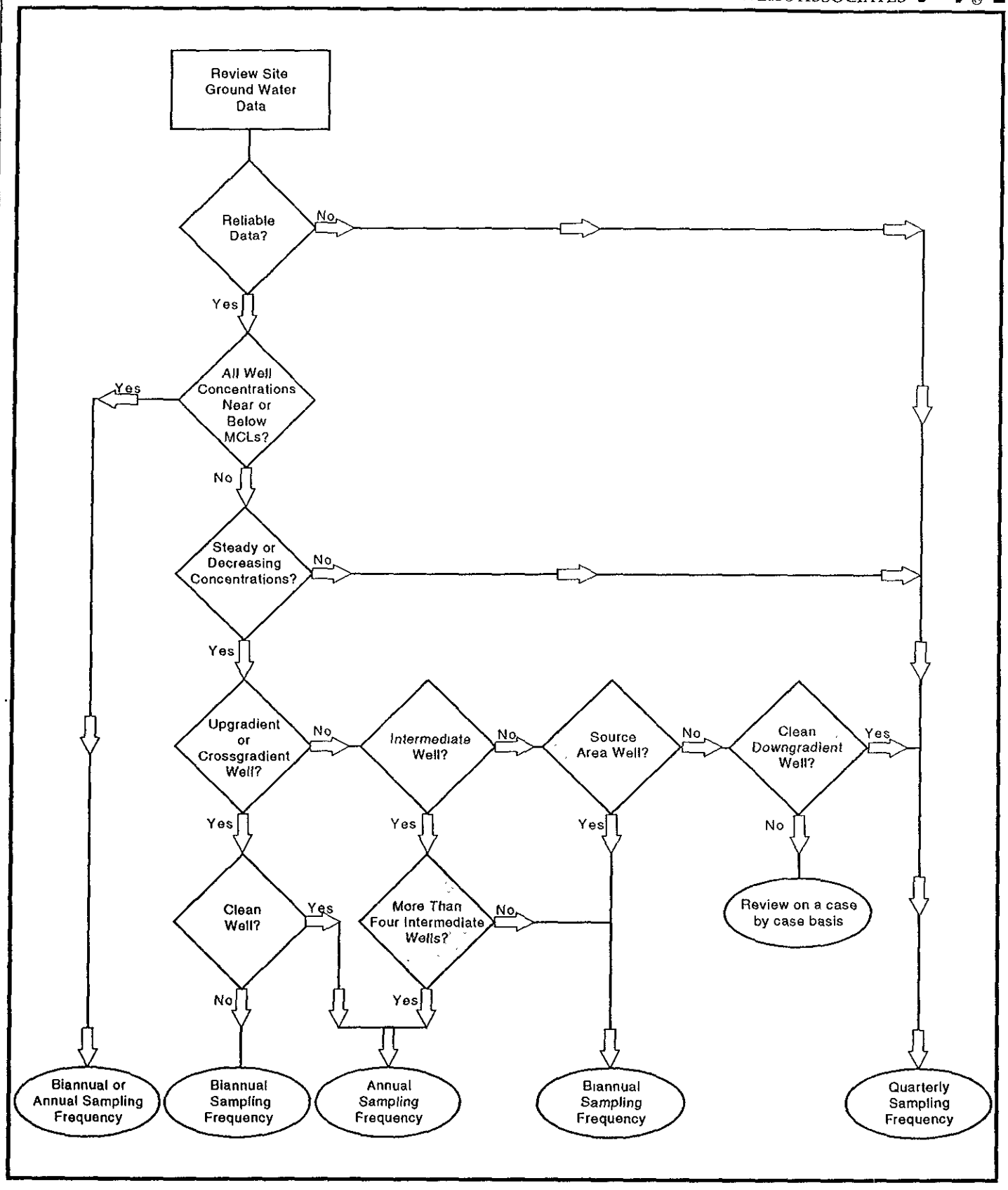

Figure 3. Ground Water Sampling Frequency Determination Chart