CHEVRON SITE STATUS REPORT

SITE NUMBER 91026 DATE March 14, 1990

CONSULTANT Weiss Associates

This sheet must be attached to any reports submitted to Chevron. All status information must be updated. The status information will be used in Chevron's quarterly summary reports to the RWQCB.

1. Please indicate the status of the definition of soil, liquid hydrocarbon and dissolved hydrocarbon plumes.

INVESTIGATION STATUS:

SOIL: N LIQUID HYDROCARBON: I
DISSOLVED HYDROCARBON: I

Use the following letters to describe the status of the investigation:

STATUS CODE/DESCRIPTION	EXPLANATION
I = In progress	We are still in the process of defining the plume
N = Not applicable	There has been no contamination of this nature found - i.e., there is no liquid hydrocarbon found
X = Definition complete	We have defined the plume - located the zero line.

2. Please indicate the status of the remediation of soil, liquid hydrocarbon and dissolved hydrocarbon.

REMEDIATION STATUS:

SOIL: N LIQUID HYDROCARBON: T
DISSOLVED HYDROCARBONS: T

Use the following codes to describe the status of the remediation:

STATUS CODE/DESCRIPTION	EXPLANATION
T = To be determined	This is the code used until it is determined whether or not remediation will be required.
D = Design or permitting	The system is being designed or we are waiting for permits.
I = In progress	The remediation system is operating.
N = Not applicable	Remediation is not required.
X = Remediation complete	Remediation has been completed.

KGH/mlc:Z133

Prepared by _____

WEISS ASSOCIATES
Geologic and Environmental Services
Fax: 415-601-0112 Phone: 415-601-0111
5500 Shellmound Street, Emeryville, CA 94608

TRANSMITTAL LETTER

FROM: Mariette Shin

DATE: May 3, 1990

TO: Gil Wistar
Alameda County Dept. of Health
Hazardous Materials Division
80 Swan Way, Suite 200
Oakland, CA 94621

VIA:
___ First Class Mail
___ Fax ___ pages
___ UPS (Surface)
_X_ Federal Express
___ Courier

SUBJECT: Former Chevron Service Station #91026
3701 Broadway
Oakland, CA 94611

JOB: 4-418-01

AS:
_X_ We discussed on the telephone on May 3, 1990.
___ You requested _____
___ We believe you may be interested
___ Is required

WE ARE SENDING:
_X_ Enclosed
___ Under Separate Cover Via _____

The 1st quarter ground water monitoring report for the subject site which includes the sampling frequency recommendations made by Weiss Associates.

FOR:
_X_ Your information
___ Your use
_X_ Your review & comments
___ Return to you

PLEASE:
___ Keep this material
___ Return by _____
_X_ Acknowledge receipt

MESSAGE: Please call me back as soon as you are able. We will hold off on implementing our recommendations for semi-annual sampling this quarter, but will discontinue sampling those wells not sealable against surface water intrusion.

C:WP\

Chevron

Chevron U.S.A. Inc.
2410 Camino Ramon, San Ramon, California • Phone (415) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

Marketing Operations

D. Moller
Manager, Operations
S. L. Patterson
Area Manager, Operations
C. G. Trimbach
Manager, Engineering

March 13, 1990

Rafat Shahid
Alameda County Environmental Health Department
80 Swan Way #200
Oakland, California 94621

Re: Former Chevron Facility #91026
3701 Broadway
Oakland, California

Dear Mr. Shahid:

Enclosed are the results of the quarterly ground water sampling conducted by Weiss Associates (WA) at the subject site. All water samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and aromatic hydrocarbons (BETX). Ground water samples from monitoring wells A, B-1, B-2, B-4, B-6, and B-7 contained benzene above the California Department of Health Services (DHS) maximum contaminant level (MCL) for drinking water. Ground water from monitoring wells B-2 and B-7 contained ethylbenzene and xylenes above the DHS MCL and samples from monitoring wells B-1, B-2, and B-7 contained toluene above the DHS recommended action level for drinking water. Monitoring wells B and B-3 were not sampled due to the large volume of evacuation water required and the presence of free-floating hydrocarbons, repectively. A remediation system is being designed for the site. If you have any questions or comments, please contact Lisa Marinaro at (415) 842-9527.

Please note that WA has evaluated the monitoring program at this site. Of the eleven monitoring wells currently being sampled quarterly, WA has determined that 4 wells should be sampled bi-annually and 3 wells should be destroyed because they are constructed of six to twelve inch diameter corrugated steel casing and cannot be sealed against surface water instruction as discussed in the report. The four remaining wells will continue to be sampled on a quarterly basis. Justification for these modifications is furnished in the WA report. In accordance with their recommendations, Chevron proposes to modify the sampling frequency of these 7 wells. WA will reevaluate their recommendations annually.

I declare under penalty of perjury that, to the best of my knowledge, the information contained in the attached report is true and correct and that any recommended actions are appropriate under the circumstances.

Sincerely,
D. Moller

By _____
Lisa Marinaro
Engineer

LAM/wa
Enclosure

cc: Don Dalke
Regional Water Quality Control Board, 1800 Harrison Street, Oakland, California 94612

WEISS ASSOCIATES
Geologic and Environmental Services
Fax: 415-547-5043 Phone: 415-547-5420
5500 Shellmound Street, Emeryville, CA 94608

March 13, 1990

Lisa Marinaro
Chevron USA
P.O. Box 5004
San Ramon, CA 94583-0804

Re: Former Chevron Service Station #91026
3701 Broadway
Oakland, California
WA Job #4-418-01

Dear Ms. Marinaro:

Weiss Associates (WA) collected ground water samples from nine monitoring wells on February 8, 1990 as part of the quarterly ground water monitoring program at former Chevron Service Station #91026 in Oakland, California (Figure 1). Monitoring wells B and B-3 were not sampled. Ground water from monitoring wells A, B-1, B-2, B-4, B-6 and B-7 (Figure 2) contained benzene, ethylbenzene and/or xylenes above the California Department of Health Services (DHS) maximum contaminant level (MCL) for drinking water. In addition, ground water samples from monitoring wells B-2, B-4 and B-7 contained toluene above the DHS recommended action level for drinking water.

GROUND WATER SAMPLING

Personnel: Eric Anderson and David Charles
WA Position: Staff Geologist and Environmental Technician, respectively
Date of sampling: February 8, 1990

Monitoring/other wells sampled: A, B-1, B-2, B-4, B-6, B-7, EA-1, EA-2, F

- Wells not sampled due to presence of free-floating hydrocarbons: B-3
- Other well not sampled: Monitoring well B did not contain free-floating hydrocarbons this quarter but was not sampled because of the large volume of evacuation water necessary.

QUARTERLY SUMMARY REPORT, SEPTEMBER 1990

Chevron Facility #9-1026, 3701 Broadway, Oakland, California

SITE HISTORY

- Prior to 1989, thirteen ground water monitoring wells were installed at the site by a consultant not identified by Chevron.
- In May 1989, WA began quarterly ground water monitoring at the site.
- In August 1989, WA collected ground water samples at the site. Monitoring wells B and B-3 contained floating hydrocarbons. The quarterly monitoring report was issued on September 14, 1989.
- In November 1989, WA collected ground water samples at the site. The quarterly monitoring report was issued on December 1989. Monthly bailing of floating hydrocarbons in monitoring wells B and B-3 began.
- In February 1990, WA collected ground water at the site. The quarterly monitoring report was issued on March 13, 1990. Monitoring well B-3 contained floating hydrocarbons, however, floating hydrocarbons were not detected in monitoring well B.
- In May 1990, WA collected ground water samples at the site. Monitoring well B-3 contained floating hydrocarbons. The quarterly monitoring report was issued on June 25, 1990.

WORK DONE THIS QUARTER

- WA collected ground water samples on August 9, 1990.

GROUND WATER MONITORING

- On august 9, 1990, monitoring wells B and B-3 contained floating hydrocarbons. Dissolved hydrocarbon concentrations in the other site wells ranged from <50 to 100,000 ppb TPH-G. Ground water was between about 14 and 19 ft below grade and flowed southwestward to westward. This report is being prepared for submittal.

PLANNED SITE ACTIVITIES

- WA will continue quarterly ground water monitoring at the site.
- WA determined that monitoring wells B, B-6 and B-7 are poorly constructed. These wells will be repaired or properly destroyed.
- A ground water remediation system is being planned by others.

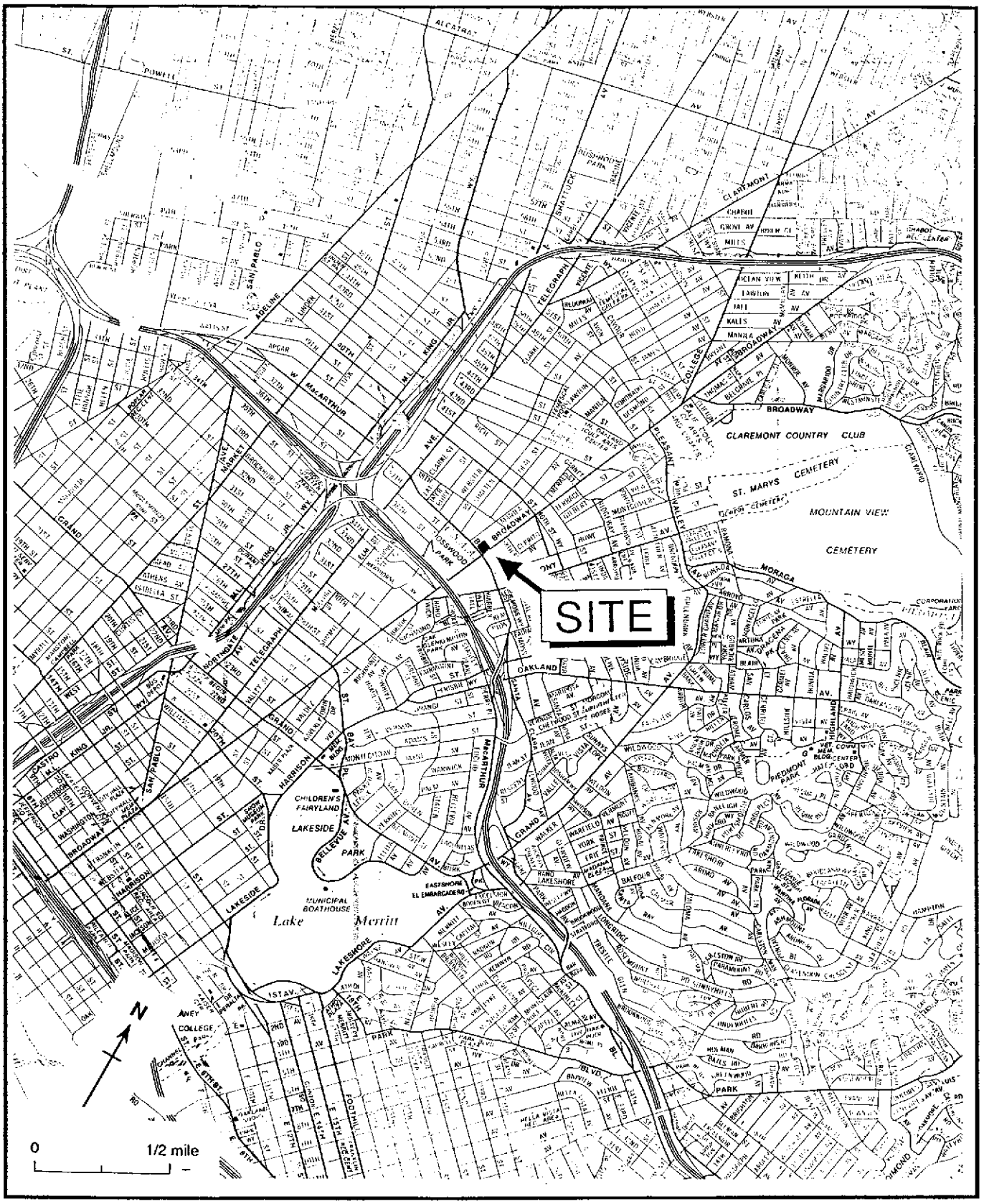

Figure 1. Site Location Map -Former Chevron Service Station #91026, 3701 Broadway, Oakland, California

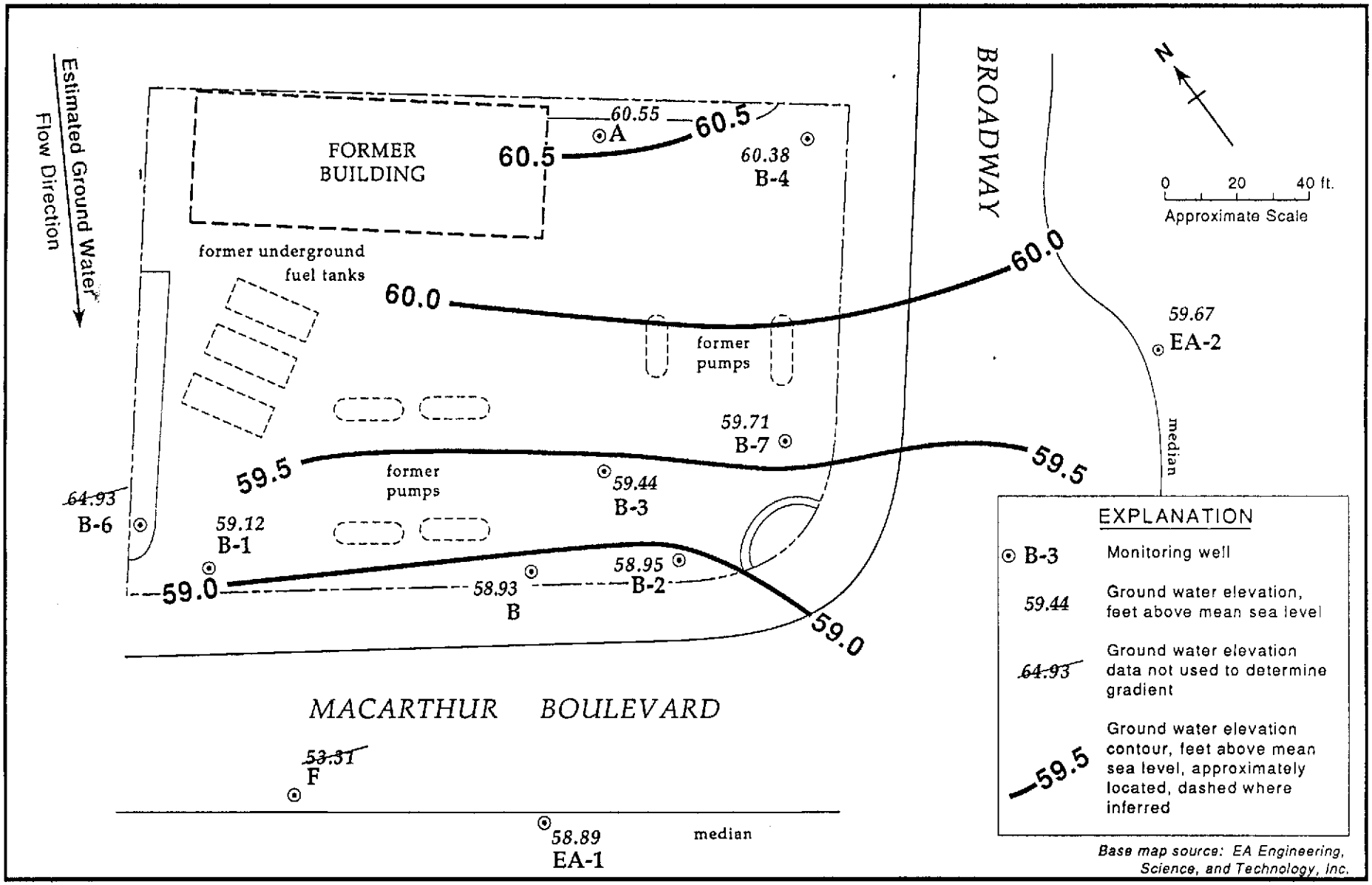

Figure 2. Monitoring Well Locations and Ground Water Contours - February 8, 1990 - Former Chevron Service Station #91026, 3701 Broadway, Oakland, California

3/12/90

Method of purging wells:

- Steam-cleaned PVC bailer: A, B-2, B-6, B-7, EA-1, EA-2
- Steam-cleaned Teflon bailer: B-4, F
- Dedicated Teflon bailer: B-1

Volume of water purged prior to sampling:

- Wells that were purged of about three well-casing volumes, approximately 26 to 30 gallons: EA-1, EA-2
- Wells that were purged dry; water level was allowed to recover to within 80 percent of static water level or for at least two hours prior to sampling: A, B-1, B-2, B-4, B-6, B-7, F

Method of ground water sample collection:

- Decanted from steam-cleaned Teflon bailer: A, B-2, B-4, B-6, EA-1, EA-2, F
- Decanted from end of dedicated Teflon bailer: B-1, B-7

Method of containing ground water samples:

- 40 ml glass, volatile organic analysis (VOA) vials, preserved with hydrochloric acid and sealed in plastic guard bottles containing activated carbon pellets

All samples were refrigerated and transported under chain-of-custody to the analytical laboratory.

Water samples transported to:

- GTEL Environmental Laboratories, Inc., Concord, California

Samples were received by laboratory on February 9, 1990

Quality assurance/quality control:

- A bailer blank was submitted for analysis.
- A travel blank was submitted for analysis.

Water sample collection records and chain-of-custody forms are included as Attachments A and B, respectively.

GROUND WATER ELEVATIONS

Water levels were measured in: all wells

Water levels were measured on February 8, 1990.

Direction of ground water flow: Southwestward

Water levels and ground water elevations are presented in Table 1. Ground water elevation contours are plotted on Figure 2. Ground water elevations have risen approximately 1 ft since the previous quarter. Ground water elevation data from monitoring well B-6 was not used to determine gradient because of the large discrepancy between the ground water elevation this quarter and historical ground water elevations at B-6. Data from monitoring well F was not used to determine gradient because of the large inconsistency of the ground water elevation at F relative to ground water elevations measured in other wells during this and previous quarters.

CHEMICAL ANALYSES

All ground water samples were analyzed for:

- Total petroleum hydrocarbons as gasoline (TPH-G) by modified EPA Method 8015
- Benzene, ethylbenzene, toluene and xylenes (BETX) by EPA Method 8020

Samples were analyzed by laboratory on February 14, 1990. The results of the water analyses are presented in Table 2 and the laboratory analytical reports are included as Attachment C. The detection limit for TPH-G has been lowered from 500 parts per billion (ppb) to 50 ppb as advised by the Regional Water Quality Control Board.

Table 1. Ground Water Elevation Data, Former Chevron Service Station #91026, 3701 Broadway, Oakland, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)	Thickness of Floating Hydrocarbons in well (ft)
A	5/10/89	75.28[a]	13.92	61.36	
	8/9/89		15.62	59.66	
	11/9/89		15.95	59.33	
	2/8/90		14.73	60.55	
B	5/10/89	73.39[a]	13.97	59.58[b]	.20
	8/9/89		15.69	57.86[b]	.20
	11/9/89		15.29	58.16[b]	.08
	2/8/90		14.46	58.93	
B-1	5/10/89	71.77[a]	12.58	59.19	
	8/9/89		14.09	57.68	
	11/9/89		14.06	57.71	
	2/8/90		12.65	59.12	
B-2	5/10/89	74.51[a]	14.58	59.93	
	8/9/89		16.06	58.45	
	11/9/89		16.95	57.56	
	2/8/90		15.56	58.95	
B-3	5/10/89	74.12[a]	13.92	60.20	
	8/9/89		15.38	58.74	
	11/9/89		15.55	58.61[b]	.05
	2/8/90		14.68	59.44[b]	.003
B-4	5/10/89	76.43[a]	14.93	61.50	
	8/9/89		16.65	59.78	
	11/9/89		16.99	59.44	
	2/8/90		16.05	60.38	
B-6	5/10/89	72.66[a]	12.11	60.55	
	8/9/89		14.72	57.94	
	11/9/89		13.85	58.81	
	2/8/90		7.73	64.93	
B-7	5/10/89	75.40[a]	14.73	60.67	
	8/9/89		16.36	59.04	
	11/9/89		16.64	58.76	
	2/8/90		15.69	59.71	

-- Table 1 continues on next page --

Table 1. Ground Water Elevation Data, Former Chevron Service Station #91026, 3701 Broadway, Oakland, California (continued)

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)	Thickness of Floating Hydrocarbons in well (ft)
EA-1	5/10/89	73.94[a]	14.56	59.38	
	8/9/89		16.09	57.85	
	11/9/89		15.84	58.10	
	2/8/90		15.05	58.89	
EA-2	5/10/89	76.24[a]	15.95	60.29	
	8/9/89		17.45	58.79	
	11/9/89		17.41	58.83	
	2/8/90		16.57	59.67	
F	5/10/89	72.01[a]	18.70	53.31	
	8/9/89		19.03	52.98	
	11/9/89		19.02	52.99	
	2/8/90		18.70	53.31	

[a] = Top-of-Casing surveyed on 2/8/90

[b] = Ground water elevation adjusted for free-floating hydrocarbons in the well by the relation: Corrected ground water elevation = top-of-casing - depth to water + (0.8 x hydrocarbon thickness)

- Isoconcentration maps of TPH-G and benzene are included as Figures 3 and 4, respectively.

Discussion of analytic results for ground water for this quarter:

- Hydrocarbon concentrations in monitoring wells A, B-2, B-4 and F are consistent with historical results.
- Hydrocarbon concentrations in monitoring wells B-1, B-6 and B-7 are decreasing and are at historical lows.
- Hydrocarbons have not been detected for the last four quarters in monitoring well EA-1.
- BETX were not detected in monitoring well EA-2, which is consistent with previous results.

TABLE 2. Analytic Results for Ground Water - Former Chevron Service Station #91026, 3701 Broadway, Oakland, California

Well ID	Date Sampled	Analytical Lab	Analytic Method	TPH-G	B	E	T	X
				<----------parts per billion (µg/L) ---------->				
A	5-09-89	SAL	8015/8020	11,000	260	94	<2	230
	8-09-89	SAL	8015/8020	12,000	370	100	<1.5	240
	11-09-89	SAL	8015/8020	16,000	690	180	10	350
	2-08-90	GTEL	8015/8020	14,000	600	120	7	270
B	5-09-89 [a]	---	---	---	---	---	---	---
	8-09-89 [a]	---	---	---	---	---	---	---
	11-09-89 [a]	---	---	---	---	---	---	---
	2-08-90 [b]	---	---	---	---	---	---	---
B-1	5-10-89	SAL	8015/8020	16,000	2,300	81	260	740
	8-09-89	SAL	8015/8020	12,000	2,600	100	340	870
	11-09-89	SAL	8015/8020	17,000	340	110	140	760
	2-08-90	GTEL	8015/8020	5,500	70	17	19	150
B-2	5-09-89	SAL	8015/8020	170,000	30,000	2,300	8,400	12,000
	8-10-89	SAL	8015/8020	60,000	29,000	2,400	8,700	12,000
	11-09-89	SAL	8015/8020	110,000	32,000	2,800	5,500	12,000
	2-08-90	GTEL	8015/8020	67,000	28,000	2,300	5,900	11,000
B-3	5-10-89	SAL	8015/8020	70,000	12,000	1,400	9,500	8,900
	5-10-89 [a]	---	---	---	---	---	---	---
	11-09-89 [a]	---	---	---	---	---	---	---
	2-08-90 [a]	---	---	---	---	---	---	---
B-4	5-10-89	SAL	8015/8020	3,600	840	120	34	200
	8-09-89	SAL	8015/8020	<500	4,200	370	130	260
	8-09-89 (dup)	SAL	8015/8020	5,000	4,200	400	83	250
	11-09-89	SAL	8015/8020	14,000	6,000	530	70	300
	2-08-90	GTEL	8015/8020	12,000	5,400	460	130	320
B-6	5-09-89	SAL	8015/8020	26,000	120	250	110	1,300
	5-10-89	SAL	8015/8020	19,000	470	440	150	1,400
	11-09-89	SAL	8015/8020	13,000	70	36	36	440
	2-08-90	GTEL	8015/8020	2,900	16	10	5	58
B-7	5-10-89	SAL	8015/8020	210,000	13,000	2,000	19,000	20,000
	8-09-89	SAL	8015/8020	672,000	8,700	2,700	17,000	30,000
	11-09-89	SAL	8015/8020	150,000	7,000	1,800	12,000	16,000
	2-08-90	GTEL	8015/8020	41,000	2,500	1,100	6,900	11,000

-- Table 2 continues next page--

TABLE 2. Analytic Results for Ground Water - Former Chevron Service Station #91026, 3701 Broadway, Oakland, California (continued)

Well ID	Date Sampled	Analytical Lab	Analytic Method	TPH-G	B	E	T	X
				<----------parts per billion (µg/L) ---------->				
EA-1	5-09-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	8-09-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	11-09-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	2-08-90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6
EA-2	5-09-89	SAL	8015/8020	760	<0.5	1.1	<0.5	<0.5
	8-09-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	11-09-89	SAL	8015/8020	<500	<0.5	<0.5	1	<0.5
	2-08-90	GTEL	8015/8020	190	<0.3	<0.3	<0.3	<0.6
F	5-09-89	SAL	8015/8020	<500	<0.5	<0.5	0.6	1.0
	8-09-89 [c]	---	---	---	---	---	---	---
	11-09-89 [c]	---	---	---	---	---	---	---
	2-08-90	GTEL	8015/8020	<50	0.4	<0.3	0.3	<0.6
Travel Blank	5-10-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	8-09-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	11-09-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	2-08-90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6
Bailer Blank	5-10-89	SAL	8015/8020	<500	<0.5	<0.5	<0.5	<0.5
	2-08-90	GTEL	8015/8020	<50	<0.3	<0.3	0.3	<0.6
DHS MCLs				NE	1	680	100[d]	1,750

Abbreviations:

TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
E = Ethylbenzene
T = Toluene
X = Xylenes
DHS MCLs = Department of Health Services Maximum Contaminant Level for Drinking Water
<n = Not detected at detection limit of n parts per billion
dup = Duplicate analysis
NE = Not established by DHS
[a] = Not sampled due to presence of free-floating hydrocarbons
[b] = Not sampled due to large volume of evacuation water necessary
[c] = Not sampled because of insufficient water in the well
[d] = DHS Recommended Action Level for Drinking Water, MCL not established

Analytical Laboratory:

GTEL = GTEL Environmental Laboratories, Inc. of Concord, California
SAL = Superior Analytical Laboratories of San Francisco and Martinez, California

Analytic Methods

8015 = Modified EPA Method 8015 for TPH-G
8020 = EPA Method 8020 for BETX

SAMPLING FREQUENCY MODIFICATION

WA has developed criteria to determine when the ground water sampling frequency should be modified for ground monitoring programs (Attachment D). Based on these criteria, the historical ground water analytic results and the specific monitoring well location, WA recommends modifying the sampling frequency of the site wells as shown in Table 3.

Table 3. Modifications to Ground Water Sampling Schedule, Former Chevron Service Station #91026, 3701 Broadway, Oakland, California

Well ID	Current Sampling Frequency	Recommended Future Sampling Frequency	Rationale for Recommended Sampling Frequency
A	Quarterly	Semi-annually (1st & 3rd Quarters)	Stable hydrocarbon concentrations; upgradient well
B -FP	Quarterly	NA	Recommend this well be abandoned, corrugated steel well casing not sealable against surface water intrusion
B-1	Quarterly	Semi-annually (1st & 3rd Quarters)	Stable hydrocarbon concentrations; source area to intermediate well
B-2	Quarterly	Semi-annually (1st & 3rd Quarters)	Stable hydrocarbon concentrations; source area to intermediate well
B-3	Quarterly	Quarterly	Free-floating hydrocarbons; source area well
B-4	Quarterly	Quarterly	Hydrocarbons increasing; upgradient well
B-6	Quarterly	NA	Recommend this well be abandoned, corrugated steel well casing not sealable against surface water intrusion
B-7	Quarterly	NA	Recommend this well be abandoned, corrugated steel well casing not sealable against surface water intrusion
EA-1	Quarterly	Quarterly	Hydrocarbons not detected last 4 quarters; downgradient well

--Table 3 continues on next page--

Table 3. Modifications to Ground Water Sampling Schedule, Former Chevron Service Station #91026, 3701 Broadway, Oakland, California (continued)

Well ID	Current Sampling Frequency	Recommended Future Sampling Frequency	Rationale for Recommended Sampling Frequency
EA-2	Quarterly	Semi-annually	Stable hydrocarbon concentration; gradient well
F	Quarterly	Quarterly	Hydrocarbons stable; downgradient well

Subject to approval by the primary regulatory agency, WA will initiate this program on the next sampling episode scheduled for the second quarter 1990.

Monitoring wells B, B-6 and B-7 are constructed of six to twelve inch diameter corrugated steel casing. Steel plates held in place by overlying steel cables currently cover these wells, but cannot prevent surface water intrusion or vandalism. Therefore, WA recommends these wells be destroyed.

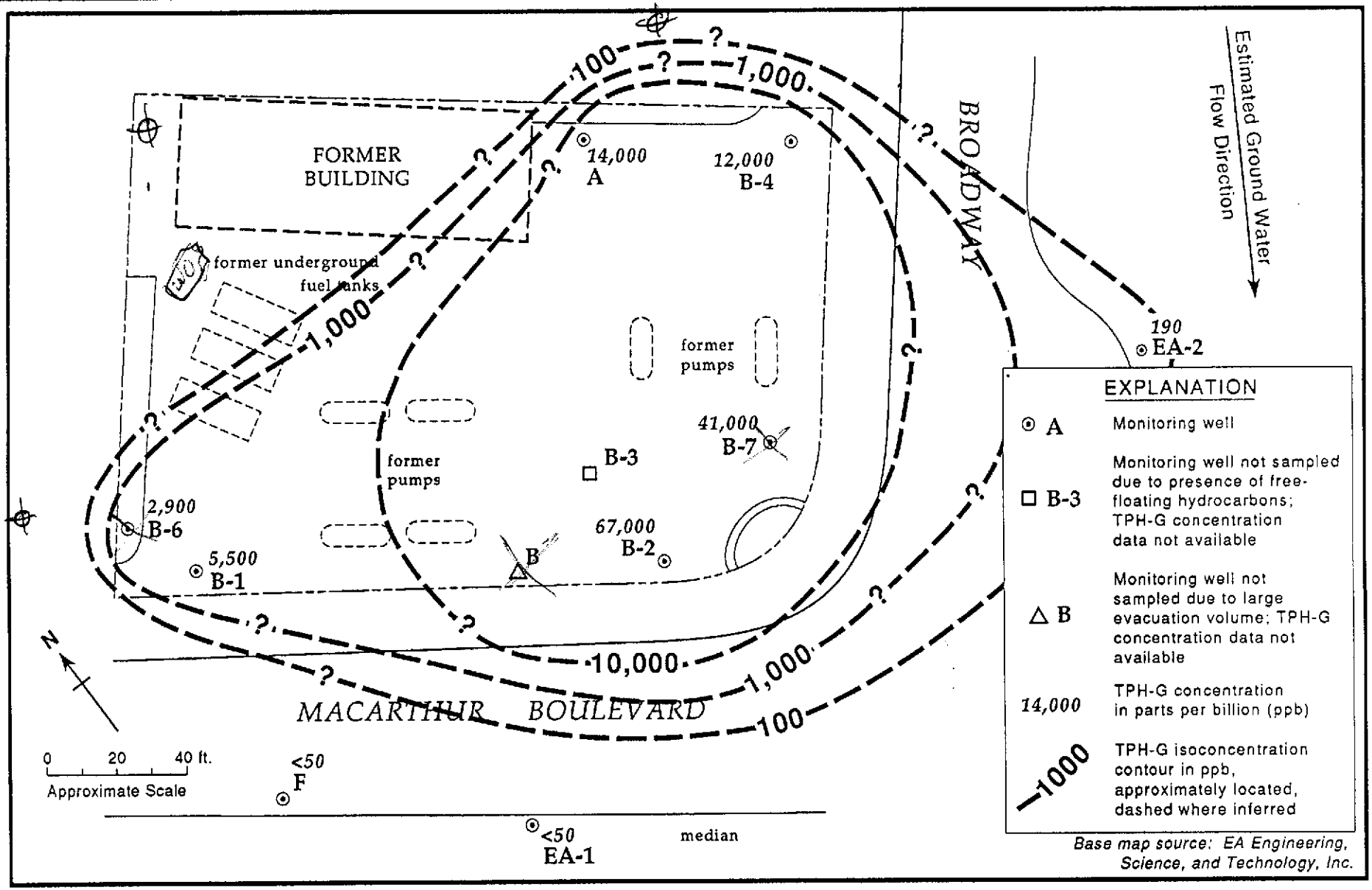

Figure 3. Total Petroleum Hydrocarbons as Gasoline (TPH-G) Isoconcentration Contours - February 8, 1990 - Former Chevron Service Station #91026, 3701 Broadway, Oakland, California

3/12/90

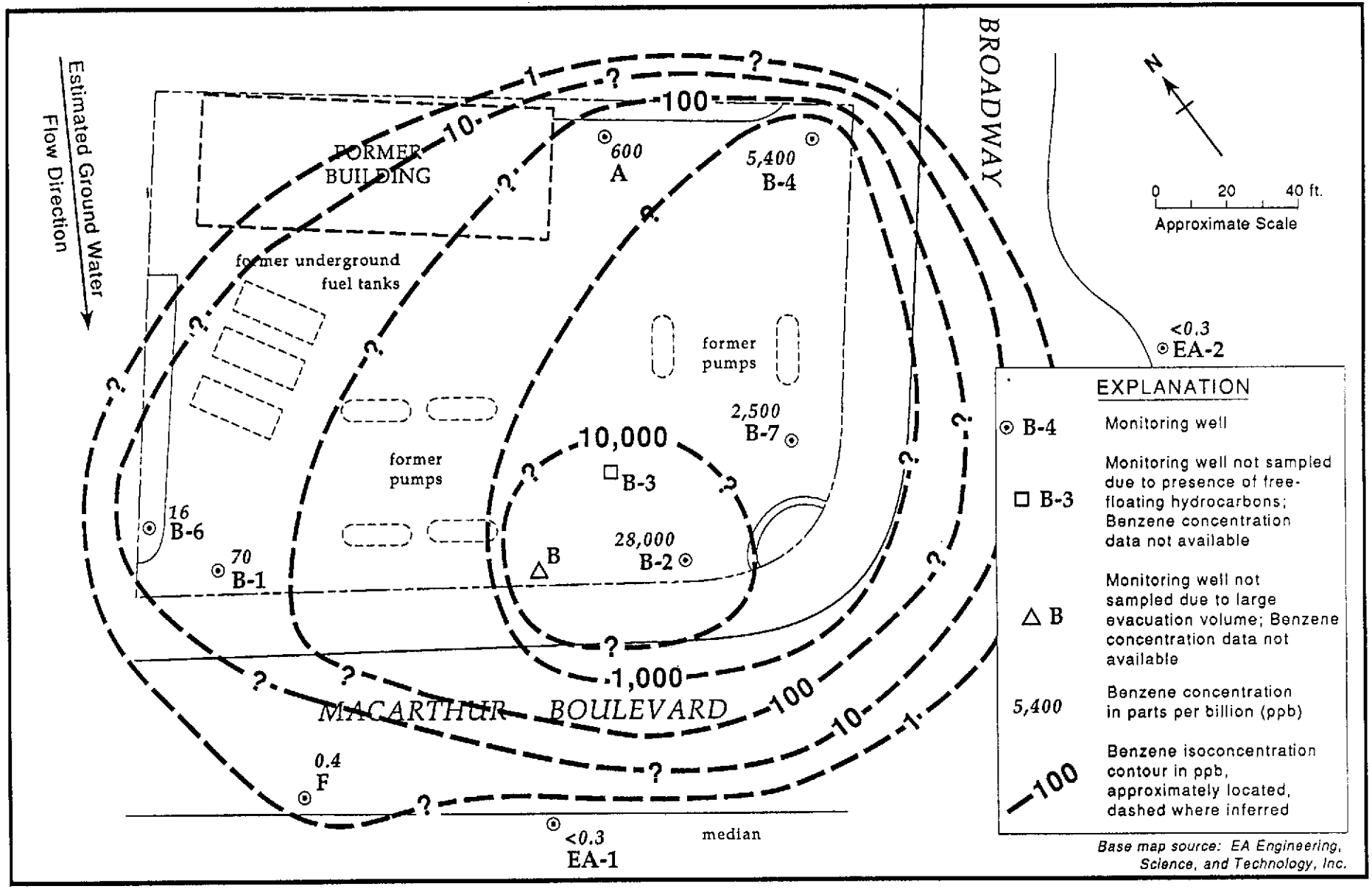

Figure 4. Benzene Isoconcentration Contours - February 8, 1990 - Former Chevron Service Station #91026, 3701 Broadway, Oakland, California

3/12/90

We appreciate the opportunity to provide hydrogeologic consulting services to Chevron and trust that this report meets your needs. If you have any questions, please call Eric Anderson or Jim Carmody.

Sincerely,
Weiss Associates

Eric W. Anderson
Staff Geologist

Eric M. Nichols
Senior Water Resources Engineer

EWA/EMN:kw

F:\ALL\CHEV\418QMMR0.WP

Attachments:
A - Water Sample Collection Records
B - Chain-of-Custody Forms
C - Analytic Reports
D - Sampling Frequency Modification Criteria

ATTACHMENT A
WATER SAMPLE COLLECTION RECORDS

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name A Date 2/8/90 Time of Sampling 14:27
Job Name Oakland III Job Number 4-418-01 Initials EWA
Sample Point Description M (M = Monitoring Well)
Location New trailer

WELL DATA: Depth to Water 17.73 ft (static/pumping) Depth to Product — ft.
Product Thickness — Well Depth 20.10 ft (spec) Well Depth 20.05 ft (sounded) Well Diameter 2 in
Initial Height of Water in Casing 5.32 ft. = volume .87 gal.
3 Casing Volumes to be Evacuated. Total to be evacuated 2.6 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 1/2" PVC Dedicated N (Y/N)
Other —

Evacuation Time: Stop 8:40
Start 8:31
Total Evacation Time 09
Total Evacuated Prior to Sampling 2.1 gal.
Evacuation Rate .2 gal. per minute
Depth to Water during Evacuation ← ft. ← time
Depth to Water at Sampling 16.39 ft. 14:21 time
Evacuated Dry? Y After 2.1 gal. Time 8:46.
80% Recovery = —
% Recovery at Sample Time 69% Time rec. rate = 0.002 gpm

Formulas/Conversions
r = well radius in ft.
h = ht of water col in ft.
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V8 casing = 2.61 gal/ft

D.T.W. = 18.68 at 8:58 = 26%

CHEMICAL DATA: Meter Brand/Number —
Calibration: — 4.0 — 7.0 — 10.0

Measured:	SC/µmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color none Odor none
Description of matter in sample: very slight amount of suspended fines
Sampling Method: Decanted from end of teflon bailer #2
Sample Port: Rate — gpm Totalizer — gal.
Time —

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	020-A	W/V	40	N	Y	HCl	8015, 8020	N	GTEL

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

Not Sampled

WEISS ASSOCIATES

WATER SAMPLING DATA Well Name B Date 2/8/90 Time 8:16
Job Name/Number C - Oakland III 14-468-01 Initials GWA
Well ✓ Spring ___ Surface ___ Other ___
Location Along Macarthur on site
WELL DATA: Well type [illegible] M (Describe; M = monitoring well)
Depth to Water 14.46 ft (pump/stat) Maximum Drawdown Limit (MDL) — ft
Well depth 34.35 ft (sounded) Well depth ___ ft (spec)
Well diameter 12 in. TOC height above ground — ft Water elev. ___ ft

interface probe

Volume Evacuated:	Pumped	Pumped	Bailed
Time: Stop			
Start			
Total hrs/min			

Total Evacuated ___ gal.
Evacuation Rate ___ gpm

Pump # and type ___ Bailer # and type ___
Hose # and type ___

Sampling Port: Rate ___ gpm Volume ___ gal.
Location/description ___

Formulas/Conversions
r = well radius in ft
h = ht of water col in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft
V_{12}" = 5.87 gal/ft

Initial height of water in casing — ___ ft; volume = ___ gal.
Evacuation at drawdown limit = 3 x initial volume = ___ gal.
Evacuation at sampling point = 1 x initial volume = ___ gal.
Total to be evacuated = ___ gal.

Water Color: ___ Odor: ___
Description of sediment and/or foreign matter in water: ___

Point of collection: ___
Depth to water during pumping ___ ft Sampling ___ ft
Pumped dry? ___ After ___ gal. Recovery rate ___
ADDITIONAL COMMENTS, LOCATION SKETCH, ENVIRONMENTAL CONDITIONS, e.g., weather, van running nearby, problems with equipment or sampling, etc., pump on/off times, etc. (over).

CHEMICAL DATA
Temperature ___ °C Thermometer # ___ Specific Conductance ___ umhos
pH ___ Calibration ___ 4.0, ___ 7.0, ___ 10.0 Calibration Temp. ___ °C

SAMPLES COLLECTED:

Sample ID No.		Bottle/ Cap (Specify)	Filtered (size, u) (N = No)	Preservative (specify) (R = Refrigerated)		Analysis	Lab
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Additional Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name B-1 Date 2/8/90 Time of Sampling 1350
Job Name C-Oakland FF Job Number 4-418-01 Initials EWA
Sample Point Description M (M = Monitoring Well)
Location western corner of site

WELL DATA: Depth to Water 12.65 ft (static, pumping) Depth to Product — ft.
Product Thickness — Well Depth — ft (spec) Well Depth 15.56 ft(sounded) Well Diameter 2 in
Initial Height of Water in Casing 2.91 ft. = volume .47 gal.
3 Casing Volumes to be Evacuated. Total to be evacuated 1.4 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 1½" Teflon Dedicated Y (Y/N)
Other —

Strong odor, sheen on purge water

Evacuation Time: Stop 9:41
Start 9:37
Total Evacation Time 4
Total Evacuated Prior to Sampling 1.0 gal.
Evacuation Rate .25 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling 13.28 ft. 1321 time
Evacuated Dry? Y After 1.0 gal. Time Rec Rate = .002 gpm
80% Recovery = 13.23'
% Recovery at Sample Time 78% Time 1321

Formulas/Conversions
r = well radius in ft.
h = ht of water col in ft.
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number —
Calibration: — 4.0 — 7.0 — 10.0

Measured:	SC/µmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color VERY LT. BROWN Odor MODERATELY STRONG
Description of matter in sample: NATURAL SEDIMENT AND FOREIGN MATERIAL - NON SILT
Sampling Method: DECANT OUT END OF TEF. SAMPLER
Sample Port: Rate — gpm Totalizer — gal.
Time —

EVIDENT SHEEN ON SAMPLE WATER SURFACE.

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	020-B1	V W/V	40	N	Y	HCl	8015, 8020	N	STEL

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name B-2 Date 2/8/90 Time of Sampling 1238
Job Name CHEV-OAK. III Job Number 4-418-01 Initials DC
Sample Point Description M (M = Monitoring Well)
Location SOUTH CORNER OF CAR LOT BY PLANTER AND SIDEWALK

WELL DATA: Depth to Water 15.56 ft (static, pumping) Depth to Product — ft.
Product Thickness — Well Depth 19.0 ft (spec) Well Depth 19.05 ft (sounded) Well Diameter 2 in
Initial Height of Water in Casing 3.49 ft. = volume .56 gal.
3 Casing Volumes to be Evacuated. Total to be evacuated 1.7 ~~1.8~~ 1.6 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 2" PVC NONE Dedicated # N (Y/N)
Other —

Evacuation Time: Stop 1015
Start 0959
Total Evacation Time 16 MIN.
Total Evacuated Prior to Sampling 1.5 gal.
Evacuation Rate .1 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling 17.20 ft. 12:28 time
Evacuated Dry? YES After 1.1 gal. Time 1015 Rec. Rate = .002 gpm
80% Recovery = 16.25
% Recovery at Sample Time 39% Time 1228

Formulas/Conversions
r = well radius in ft.
h = ht of water col in ft.
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number
Calibration: 4.0 7.0 10.0

Measured:	SC/µmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color NONE Odor LIGHT GAS
Description of matter in sample: NATURAL SEDIMENT - FIBROUS SUSPENDED MATTER
Sampling Method: PECANT OUTEND OF TEF. SAMPLER # II
Sample Port: Rate — gpm Totalizer — gal.
Time —

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	020-B-2	w/cV	40mL	N	Y	HCl	~~8010/EPA MOD. 8015~~ → 8015/8020 E.A.	N	GTEL

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

Not Sampled Due to Free Product

WEISS ASSOCIATES

WATER SAMPLING DATA Well Name R-3 Date 2/8/90 Time 8:00

Job Name/Number C-Oakland II / 4-418-01 Initials BWA

Well ✓ Spring ___ Surface ___ Other ___

Location on site

WELL DATA: Well type M (Describe; M - monitoring well)

interface probe → Depth to Water 14.68 ft (pump/stat) Maximum Drawdown Limit (MDL) ___ ft

Well depth 18.87 ft (sounded) Well depth ___ ft (spec)

Well diameter 2 in. TOC height above ground ___ ft Water elev. ___ ft

Volume Evacuated:	Pumped	Pumped	Bailed
Time: Stop			
Start			
Total hrs/min			

Total Evacuated ___ gal.

Evacuation Rate ___ gpm

Formulas/Conversions
r = well radius in ft
h = ht of water col in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Pump # and type ___ Bailer # and type ___

Hose # and type ___

Sampling Port: Rate ___ gpm Volume ___ gal.

Location/description ___

Initial height of water in casing = ___ ft; volume = ___ gal.

Evacuation at drawdown limit = 3 x initial volume = ___ gal.

Evacuation at sampling point = 1 x initial volume = ___ gal.

Total to be evacuated = ___ gal.

Water Color: ___ Odor: ___

Description of sediment and/or foreign matter in water: ___

Point of collection: ___

Depth to water during pumping ___ ft Sampling ___ ft

Pumped dry? ___ After ___ gal. Recovery rate ___

ADDITIONAL COMMENTS, LOCATION SKETCH, ENVIRONMENTAL CONDITIONS, e.g., weather, van running nearby, problems with equipment or sampling, etc., pump on/off times, etc. (over).

CHEMICAL DATA

Temperature ___ °C Thermometer # ___ Specific Conductance ___ umhos

pH ___ Calibration ___ 4.0, ___ 7.0, ___ 10.0 Calibration Temp. ___ °C

SAMPLES COLLECTED:

Sample ID No.		Bottle/ Cap (Specify)	Filtered (size, u) (N - No)	Preservative (specify) (R - Refrigerated)		Analysis	Lab
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						

Bottles: P - Polyethylene; Pp - Polypropylene; C or B - Clear/Brown Glass; O - Other (describe)

Additional Cap Codes: Py - Polyseal; V - VOA/Teflon septa; M - Metal

≈ 1/32" of free-product

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name B-4 Date 2/8/90 Time of Sampling 1425

Job Name CHEV.-OAK. III Job Number 4-418-01 Initials OC

Sample Point Description M (M = Monitoring Well)

Location E. CORNER OF LOT

WELL DATA: Depth to Water 16.05 ft (static) pumping) Depth to Product — ft.

Product Thickness — Well Depth ~~20.5~~ 19.9 ft (spec) Well Depth 19.62 ft(sounded) Well Diameter 2 in

Initial Height of Water in Casing 3.47 ft. = volume .56 gal.

3 Casing Volumes to be Evacuated. Total to be evacuated 1.7 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —

Bailer# and type 2" TEF #AM Dedicated YN (Y/N)

Other

Evacuation Time: Stop 1219

Start 1207

Total Evacation Time 10 MIN

Total Evacuated Prior to Sampling ~1.5 gal.

Evacuation Rate ~2 gal. per minute

Depth to Water during Evacuation — ft. — time

Depth to Water at Sampling 17.00 ft. 1419 time

Evacuated Dry? YES After 1.5 gal. Time 1226 Rec. Rate = .003

80% Recovery = 16.74

% Recovery at Sample Time 73 % Time 1419

Formulas/Conversions

r = well radius in ft.

h = ht of water col in ft.

vol. in cyl. = $\pi r^2 h$

7.48 gal/ft^3

V_2" casing = 0.163 gal/ft

V_3" casing = 0.367 gal/ft

V_4" casing = 0.653 gal/ft

$V_{4.5}$" casing = 0.826 gal/ft

V_6" casing = 1.47 gal/ft

V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number

Calibration: 4.0 7.0 10.0

Measured:	SC µmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color NONE Odor VERY LIGHT

Description of matter in sample: FOREIGN SURFACE MATERIAL AND VERY SMALL AMTS. OF SUSPENDED SILT

Sampling Method: DECANT OUT END OF TEF SAMPLER # AM

Sample Port: Rate — gpm Totalizer — gal.

Time —

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	020-B 4	W/cV	40mL	N	Y	HCL	602/ ~~EPA 600~~ 8015 → 8015/8020 E.A.	N	GTEL

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

WEISS ASSOCIATES

WATER SAMPLING DATA Well Name B-6 Date 2/8/90 Time 13:47
Job Name/Number C-Oakland 7th / 4-408-01 Initials EWA
Well ___ Spring ___ Surface ___ Other ___
Location W. side of lot at perimeter
WELL DATA: Well type ___ (Describe; M = monitoring well)
Depth to Water 7.73 ft (pump/stat) Maximum Drawdown Limit (MDL) ← ft
Well depth 19.61 ft (sounded) Well depth — ft (spec)
Well diameter 8 in. TOC height above ground — ft Water elev. — ft

Volume Evacuated:	~~Pumped~~ Bailed	~~Pumped~~	Bailed
Time: Stop	10:21	10:54	
Start	10:16	10:29	
Total hrs/min	:05	:25	
Total Evacuated	48 gal.		
Evacuation Rate	1.6 gpm		

Sheen on purge water

Formulas/Conversions
r = well radius in ft
h = ht of water col in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Pump # and type — Bailer # and type 3" x 48" PVC #U
Hose # and type —

Sampling Port: Rate — gpm Volume — gal.
Location/description —

Initial height of water in casing = 11.88 ft; volume = 31.0 gal. x3
Evacuation at drawdown limit = 3 x initial volume = — gal.
Evacuation at sampling point = 1 x initial volume = — gal.
Total to be evacuated = 93 gal.
Water Color: none - sheen on surface Odor: ~~slight~~ Gasoline - like odor
Description of sediment and/or foreign matter in sample: Slight amount of suspended particulates
Point of collection: End of Teflon bailer # AL
Depth to water during pumping — ft — time Sampling 17.25 ft 13:44 time = 20 % of initial vol.
Pumped dry? Y After 48 gal. Recovery rate .04 gpm
ADDITIONAL COMMENTS, LOCATION SKETCH, ENVIRONMENTAL CONDITIONS, e.g., weather, van running nearby, problems with equipment or sampling, etc., pump on/off times, etc. (over).

CHEMICAL DATA
Temperature — °C Thermometer # — Specific Conductance — umhos
pH — Calibration — 4.0, — 7.0, — 10.0 Calibration Temp. — °C

SAMPLES COLLECTED:

Sample ID No.		Bottle/ Cap (Specify)	Filtered (size, u) (N = No)	Preservative (specify) (R = Refrigerated)		Analysis	Lab
3 020-B6	40 ml	c/v	N	HCl	R	8015, 8020	GTEL
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	— ml						
	ml						

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Additional Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

WEISS ASSOCIATES

WATER SAMPLING DATA Well Name B-7 Date 2/8/90 Time 14:15
Job Name/Number C-Oakland 444 / 4-418-01 Initials EWA
Well Y Spring ___ Surface ___ Other ___
Location on site near ~~corner~~ corner of Mac - B-way
WELL DATA: Well type M (Describe; M = monitoring well)
Depth to Water 15.69 ft (pump/~~stat~~) Maximum Drawdown Limit (MDL) — ft
Well depth 19.41 ft (sounded) Well depth — ft (spec)
Well diameter 6 in. TOC height above ground — ft Water elev. — ft

Volume Evacuated:	~~Pumped~~	Pumped	Bailed
Time: Stop	12:15		
Start	12:06		
Total hrs/min	:09		

Total Evacuated 7.3 gal.
Evacuation Rate 1.23 gpm

Formulas/Conversions
r = well radius in ft
h = ht of water col in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Pump # and type — Bailer # and type 3" PVC #XX
Hose # and type —

Sampling Port: Rate — gpm Volume — gal.
Location/description —

Initial height of water in casing = 3.72 ft; volume = 5.47 gal. x 3
Evacuation at drawdown limit = 3 x initial volume = — gal.
Evacuation at sampling point = 1 x initial volume = — gal.
Total to be evacuated = 16.4 gal.
Water Color: ~~none~~ grey Odor: Hydrocarbon odor - like gasoline
Description of sediment and/or foreign matter in sample: Slight ~~trace~~ amount of suspended fines
Point of collection: End of Teflon bailer lwd. to B-6 (yes)
Depth to water during pumping — ft — time Sampling 17.23 ft 14:10 time = 59% of initial vol
Pumped dry? Y After 7.3 gal. Recovery rate 0.03 gpm
ADDITIONAL COMMENTS, LOCATION SKETCH, ENVIRONMENTAL CONDITIONS, e.g., weather, van running nearby, problems with equipment or sampling, etc., pump on/off times, etc. (over).

CHEMICAL DATA
Temperature — °C Thermometer # — Specific Conductance — umhos
pH — Calibration — 4.0, — 7.0, — 10.0 Calibration Temp. — °C

SAMPLES COLLECTED:

Sample ID No.		Bottle/ Cap (Specify)	Filtered (size, u) (N = No)	Preservative (specify) (R = Refrigerated)		Analysis	Lab
020-B7	40 ml	C/V	N	HCl	R	~~8015~~/8020	GTEL
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	— ml						
	ml						

3

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Additional Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name EA-1 Date 2/8/90 Time of Sampling 1128
Job Name CHEV.-OAK. III Job Number 4-418-01 Initials OC
Sample Point Description M (M = Monitoring Well)
Location IN MERIDIAN STRIP ON MACARTHUR

WELL DATA: Depth to Water 15.05 ft (static, pumping) Depth to Product — ft.
Product Thickness — Well Depth 30.2 ft (spec) Well Depth 30.49 ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 15.44 ft. = volume 10 gal.
3 Casing Volumes to be Evacuated. Total to be evacuated 30 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 4" PVC II PP Dedicated N (Y/N)
Other —

Evacuation Time: Stop 1056 1106 1120
Start 1049 1100 1114
Total Evacation Time 11 MIN
Total Evacuated Prior to Sampling 30+ gal.
Evacuation Rate 1.5 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling 15.05 ft. 1124 time
Evacuated Dry? NO After — gal. Time —
80% Recovery = —
% Recovery at Sample Time — Time —

Formulas/Conversions
r = well radius in ft.
h = ht of water col in ft.
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number
Calibration: 4.0 7.0 10.0

Measured:	SC/µmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color MED. BROWN Odor NONE
Description of matter in sample: 1% VERY FINE MED. BR. SILT
Sampling Method: DECANT OUT END OF TEF. SAMPLER. SAMPLER II NN
Sample Port: Rate — gpm Totalizer — gal.
Time —

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	020-EA-1	W/C V	40mL	N	Y	HCL	602/EPA MOD. 8015	N	GTEL
							8015/8020 Ed.		

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

ATTACHMENT D
SAMPLING FREQUENCY MODIFICATION CRITERIA

ATTACHMENT D

SAMPLING FREQUENCY MODIFICATION CRITERIA

Chevron typically samples ground water on a quarterly basis at their operating or former service stations. The California Water Quality Control Board's ground water monitoring guidelines state that: "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]. California Regional Water Quality Control Board - San Francisco Bay Region (RWQCB-SFBR) personnel have indicated that the board will allow reduction of the sampling frequency on a site-specific basis if the frequency modification is justified by site conditions[2]. Therefore, WA has developed generalized criteria for determining when sampling frequency should be modified.

The recommended sampling frequency for specific monitoring wells is based upon the following factors:

- The reliability of the ground water quality analytic data,
- The trend of the dissolved hydrocarbon concentration in the well, and
- The location of the well in relation to the hydrocarbon source.

Each of these factors is discussed below.

Reliability of Ground Water Quality Analytic Data

Since the reproducibility of ground water analytic data is highly sensitive to hydrogeologic conditions as well as field sampling and laboratory analytic procedures, ground water analytic data often shows variability between sampling episodes. Seasonal ground water fluctuation can also affect hydrocarbon concentrations in ground water. Therefore, WA will reduce the sampling frequency only for wells which:

- Have been sampled on a quarterly basis for at least one year, and
- Have consistent historical analytic results allowing a reliable assessment of the representative hydrocarbon concentration in the well. If the variability of the analytic data prevents a reliable assessment of concentration, then we will continue to sample the well(s) quarterly until a reliable assessment can be made.

Trend of Hydrocarbon Concentration

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

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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.

WEISS ASSOCIATES

WATER SAMPLING DATA Well Name EA2 Date 2/8/90 Time 14:52
Job Name/Number C - Oakland ~~FF~~ / 4-418-04 Initials EWA
Well ✓ Spring ___ Surface ___ Other ___
Location On island on B-way N. of Mac.
WELL DATA: Well type M (Describe; M = monitoring well)
Depth to Water 16.57 ft (pump/stat) Maximum Drawdown Limit (MDL) — ft
Well depth 39.15 ft (sounded) Well depth — ft (spec)
Well diameter 4 in. TOC height above ground — ft Water elev. ___ ft

Volume Evacuated:	~~Pumped~~ Bailed	Pumped	Bailed
Time: Stop	12:52		
Start	12:34		
Total hrs/min	:18		

Total Evacuated 26.6 gal.
Evacuation Rate 1.5 gpm

Pump # and type — Bailer # and type 3" PVC #AK
Hose # and type —

Formulas/Conversions
r = well radius in ft
h = ht of water col in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Sampling Port: Rate — gpm Volume — gal.
Location/description ___

Initial height of water in casing = 13.58 ft; volume = 8.87 gal. x 3
Evacuation at drawdown limit = 3 x initial volume = — gal.
Evacuation at sampling point = 1 x initial volume = — gal.
Total to be evacuated = 26.6 gal.

Water Color: none Odor: none
Description of sediment and/or foreign matter in sample: none

Point of collection: Aquated from end of Teflon bailer # G
Depth to water during pumping — ft — time Sampling 17.07 ft 14:40 time = 96 % of initial vol.
Pumped dry? almost After 26.6 gal. Recovery rate .07 gpm
ADDITIONAL COMMENTS, LOCATION SKETCH, ENVIRONMENTAL CONDITIONS, e.g., weather, van running nearby, problems with equipment or sampling, etc., pump on/off times, etc. (over).

CHEMICAL DATA
Temperature — °C Thermometer # — Specific Conductance — umhos
pH — Calibration — 4.0, — 7.0, — 10.0 Calibration Temp. — °C

SAMPLES COLLECTED:

Sample ID No.		Bottle/ Cap (Specify)	Filtered (size, u) (N = No)	Preservative (specify) (R = Refrigerated)		Analysis	Lab
020-EA2	40 ml	C/V	N	HCl	R	~~Gas+BETX~~ 8015/8020 EO.	GTEL
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						
	ml						

3

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Additional Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name F Date 2/8/90 Time of Sampling 1307
Job Name CHEV.-OAK. III Job Number 4-418-01 Initials DC
Sample Point Description M (M = Monitoring Well)
Location LEFT LANE ON W. BOUND BROADWAY O.C. MACARTHUR

WELL DATA: Depth to Water 18.70 ft (static / pumping) Depth to Product — ft.
Product Thickness — Well Depth 19.63 ft (spec) Well Depth 19.79 ft (sounded) Well Diameter 2 in
Initial Height of Water in Casing 1.1 ft. = volume .18 gal.
3 Casing Volumes to be Evacuated. Total to be evacuated .5 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 2" TEF. # JJ Dedicated N (Y/N)
Other —

Evacuation Time: Stop 1044
Start 1042
Total Evacation Time 2 MIN
Total Evacuated Prior to Sampling .1 gal.
Evacuation Rate N/A gal. per minute
Depth to Water during Evacuation — O.C ft. — time
Depth to Water at Sampling 18.95 ~~1252~~ ft. 1252 time
Evacuated Dry? YES After .05 gal. Time 1044 Rec. Rate = .001 gpm
80% Recovery = 18.91
% Recovery at Sample Time 76% Time 1252

Formulas/Conversions
r = well radius in ft.
h = ht of water col in ft.
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number
Calibration: 4.0 7.0 10.0

Measured:	SC/µmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color GREY Odor NONE
Description of matter in sample: GREY/BLACK SEDIMENTS
Sampling Method: DECANT OUT BOTTOM OF TEF. SAMPLER
Sample Port: Rate — gpm Totalizer — gal.
Time —

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	020-F	W/cV	40mL	N	Y	HCL	~~602~~/ETA MOD 8015 → 8015/8020 E.d.	N	GTEL

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

Trip Blanks

WEISS ASSOCIATES

WATER SAMPLING DATA Well Name ~ Date 2/8/90 Time 8:00
Job Name/Number C - Oakland III / 4-418-01 Initials EWA
Well ___ Spring ___ Surface ___ Other _____
Location _____
WELL DATA: Well type _____ (Describe; M = monitoring well)
Depth to Water _____ ft (pump/stat) Maximum Drawdown Limit (MDL) _____ ft
Well depth _____ ft (sounded) Well depth _____ ft (spec)
Well diameter ___ in. TOC height above ground _____ ft Water elev. _____ ft

Volume Evacuated:	Pumped	Pumped	Bailed
Time: Stop			
Start			
Total hrs/min			

Total Evacuated _____ gal.
Evacuation Rate _____ gpm

Pump # and type _____ Bailer # and type _____
Hose # and type _____

Sampling Port: Rate _____ gpm Volume _____ gal.
Location/description _____

Initial height of water in casing = _____ ft; volume = _____ gal.
Evacuation at drawdown limit = 3 x initial volume = _____ gal.
Evacuation at sampling point = 1 x initial volume = _____ gal.
Total to be evacuated = _____ gal.
Water Color: _____ Odor: _____
Description of sediment and/or foreign matter in sample: _____

Point of collection: _____
Depth to water during pumping _____ ft _____ time Sampling _____ ft _____ time
Pumped dry? _____ After _____ gal. Recovery rate _____
ADDITIONAL COMMENTS, LOCATION SKETCH, ENVIRONMENTAL CONDITIONS, e.g., weather, van running nearby, problems with equipment or sampling, etc., pump on/off times, etc. (over).

Formulas/Conversions
r = well radius in ft
h = ht of water col in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

CHEMICAL DATA
Temperature _____ °C Thermometer # _____ Specific Conductance _____ umhos
pH ___ Calibration ___ 4.0, ___ 7.0, ___ 10.0 Calibration Temp. _____ °C

SAMPLES COLLECTED:

Sample ID No.			Bottle/ Cap (Specify)	Filtered (size, u) (N = No)	Preservative (specify) (R = Refrigerated)		Analysis	Lab
020-21	40	ml	c/u	N	HCl	R	8015/8020	GTEL
		ml						
		ml						
		ml						
		ml						
		ml						
		ml						
		ml						
	-	ml						
		ml						

3

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Additional Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

Bailer Blank

WEISS ASSOCIATES

WATER SAMPLING DATA Well Name EA-2 Date 2/8/90 Time 14:45
Job Name/Number C-Oakland IA / 4-418-01 Initials EWA
Well ___ Spring ___ Surface ___ Other ___
Location ___
WELL DATA: Well type ___ (Describe; M = monitoring well)
Depth to Water ___ ft (pump/stat) Maximum Drawdown Limit (MDL) ___ ft
Well depth ___ ft (sounded) Well depth ___ ft (spec)
Well diameter ___ in. TOC height above ground ___ ft Water elev. ___ ft

Volume Evacuated: Pumped Pumped Bailed
Time: Stop ___
Start ___
Total hrs/min ___
Total Evacuated ___ gal.
Evacuation Rate ___ gpm

Formulas/Conversions
r = well radius in ft
h = ht of water col in ft
vol. in cyl. = $\pi r^2 h$
7.48 gal/ft^3
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Pump # and type ___ Bailer # and type ___
Hose # and type ___

Sampling Port: Rate ___ gpm Volume ___ gal.
Location/description ___

Initial height of water in casing = ___ ft; volume = ___ gal.
Evacuation at drawdown limit = 3 x initial volume = ___ gal.
Evacuation at sampling point = 1 x initial volume = ___ gal.
Total to be evacuated = ___ gal.
Water Color: none Odor: none
Description of sediment and/or foreign matter in sample: none - Arrowhead D.I. water, NO lot #
Point of collection: Decanted from end of teflon bailer # 6
Depth to water during pumping ___ ft ___ time Sampling ___ ft ___ time
Pumped dry? ___ After ___ gal. Recovery rate ___
ADDITIONAL COMMENTS, LOCATION SKETCH, ENVIRONMENTAL CONDITIONS, e.g., weather, van running nearby, problems with equipment or sampling, etc., pump on/off times, etc. (over).

CHEMICAL DATA
Temperature ___ °C Thermometer # ___ Specific Conductance ___ umhos
pH ___ Calibration ___ 4.0, ___ 7.0, ___ 10.0 Calibration Temp. ___ °C

SAMPLES COLLECTED:

	Sample ID No.		Bottle/ Cap (Specify)	Filtered (size, u) (N = No)	Preservative (specify) (R = Refrigerated)		Analysis	Lab
3	020-22	40 ml	C/V	N	HCl	R	~~Gas BETX~~ 8015/8020 E.D.	GTEL
		ml						
		ml						
		ml						
		ml						
		ml						
		ml						
		ml						
		ml						
		ml						

Bottles: P = Polyethylene; Pp = Polypropylene; C or B = Clear/Brown Glass; O = Other (describe)
Additional Cap Codes: Py = Polyseal; V = VOA/Teflon septa; M = Metal

ATTACHMENT B
CHAIN-OF-CUSTODY FORMS

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number: 9026 (Oakland III)
~~Consultant~~ ~~LAB~~ Release Number: 2692251
Consultant Project Number: 4-418-01
Consultant Name: Weiss Associates
Address: 5500 Shellmound St, Emeryville, CA 94608
Fax Number: (415) - 547-5420
Project Contact (Name): Mariette Shin
(Phone): (415) 547-5043

Chevron Contact (Name): Lisa Marinaro
(Phone): (415) 842-9527
Laboratory Name: GTEL
Contract Number: N 46 CWC 0244-9-X
Samples Collected by (Name): EWA / DWC
Collection Date: 2/8/90
Signature: Eric Anderson

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed: Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803				Remarks
020-A		3	W	G	14:27	HCl	X	✓			✓							
020-B1					13:50			✓			✓							
020-B2					12:38			✓			✓							
020-B4					14:25			✓			✓							
020-B6					13:47			✓			✓							
020-B7					14:15			✓			✓							
020-EA1					11:28			✓			✓							
020-EA2					14:52			✓			✓							
020-F					13:07			✓			✓							
020-21					8:00			✓			✓							
020-22		↓	↓	↓	14:45	↓	↓	✓			✓							

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	Turn Around Time (Circle Choice)
Eric Anderson (Locked in storage overnight)	Weiss Associates	2/8/90	Mariette Shin	Weiss Assoc	2/9/90 11:20	24 Hrs
Mariette Shin	Weiss Assoc	2/9/90 11:20	[signature]	CONCORD LAB	2/9/90 11:20	48 Hrs
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time	5 Days
			Kathy Black		2-9-90 3:00	(10 Days)

Printed in U.S.A.

MS 5138 16 85

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Western Region
4080-C Pike Ln., Concord, CA 94520
(415) 685-7852
In CA: (800) 544-3422
Outside CA: (800) 423-7143

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

MARIETTE SHIN
WEISS ASSOCIATES
5500 SHELLMOUND ST.
EMERYVILLE, CA 94608

DEAR MS. SHIN:

Attached please find the analytical results for the samples received by GTEL on February 9, 1990.

GTEL maintains a formal quality assurance program to ensure the integrity of the analytical results. All quality assurance criteria were achieved during the analysis unless otherwise noted in the footnotes to the analytical report.

The specific analytical methods used and cited in this report are approved by state and federal regulatory agencies. GTEL is certified for the analysis reported herein by the California State Department of Health Services under certificate number 194.

If you have any questions regarding this analysis, or if we may service any additional analytical needs, please give us a call.

Sincerely,

GTEL Environmental Laboratories, Inc.

Emma P. Popek
Laboratory Director

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

Table 1

ANALYTICAL RESULTS

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015[1]

GTEL Sample Number		01	02	03	04
Client Identification		020-A	020-B1	020-B2	020-B4
Date Sampled		02/08/90	02/08/90	02/08/90	02/08/90
Date Analyzed		02/14/90	02/14/90	02/14/90	02/14/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	600	70	28000	5400
Toluene	0.3	7	19	5900	130
Ethylbenzene	0.3	120	17	2300	460
Xylene (total)	0.6	270	150	11000	320
TPH as Gasoline	50	14000	5500	67000	12000

GTEL Sample Number		05	06	07	08
Client Identification		020-B6	020-B7	020-EA1	020-EA2
Date Sampled		02/08/90	02/08/90	02/08/90	02/08/90
Date Analyzed		02/14/90	02/14/90	02/14/90	02/14/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	16	2500	<0.3	<0.3
Toluene	0.3	5	6900	<0.3	<0.3
Ethylbenzene	0.3	10	1100	<0.3	<0.3
Xylene (total)	0.6	58	11000	<0.6	<0.6
TPH as Gasoline	50	2900	41000	<50	190

1 = Extraction by EPA Method 5030

GTEL ENVIRONMENTAL LABORATORIES, INC

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

Table 1 (Continued)

ANALYTICAL RESULTS

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015[1]

GTEL Sample Number		09	10	11	
Client Identification		020-F	020-21	020-22	
Date Sampled		02/08/90	02/08/90	02/08/90	
Date Analyzed		02/14/90	02/14/90	02/14/90	
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	0.4	<0.3	<0.3	
Toluene	0.3	0.3	<0.3	0.3	
Ethylbenzene	0.3	<0.3	<0.3	<0.3	
Xylene (total)	0.6	<0.6	<0.6	<0.6	
TPH as Gasoline	50	<50	<50	<50	

1 = Extraction by EPA Method 5030

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: SF8-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

QA Conformance Summary

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

1.0 Blanks

Five of 5 target compounds were below detection limits in the reagent blank as shown in Table 2.

2.0 Independent QC Check Sample

The control limits were met for 4 out of 4 QC check compounds as shown in Table 3.

3.0 Surrogate Compound Recoveries

Percent recovery limits were met for the surrogate compound (naphthalene) for all samples as shown in Table 4.

4.0 Matrix Spike (MS) Accuracy

Percent recovery limits were met for 4 of 4 compounds in the MS as shown in Table 5.

5.0 Reagent Water Spike (WS) and Reagent Water Spike (WSD) Duplicate Precision

Relative percent difference (RPD) criteria was met for 4 of 4 analytes in the WS and WSD as shown in Table 6.

6.0 Sample Handling

6.1 Sample handling and holding time criteria were met for all samples.

6.2 There were exceptional conditions requiring dilution of samples.

GTEL ENVIRONMENTAL LABORATORIES, INC

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

Table 2

REAGENT BLANK DATA

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 02/14/90

Analyte	Concentration, ug/L
Benzene	<0.3
Toluene	<0.3
Ethylbenzene	<0.3
Xylene (total)	<0.6
Gasoline	<50

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

Table 3

INDEPENDENT QC CHECK SAMPLE RESULTS

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 02/06/90

Analyte	Expected Result, ug/L	Observed Result, ug/L	Recovery, %	Acceptability Limits, %
Benzene	50	50	100	85 - 115
Toluene	50	52	104	85 - 115
Ethylbenzene	50	49	98	85 - 115
Xylene (total)	150	152	101	85 - 115

Table 3a

INDEPENDENT QC CHECK SAMPLE SOURCE

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Analyte	Lot Number	Source
Benzene	LA18104	SUPELCO
Toluene	LA18104	SUPELCO
Ethylbenzene	LA18104	SUPELCO
Xylene (total)	LA18104	SUPELCO

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

Table 4

SURROGATE COMPOUND RECOVERY

Naphthalene

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Acceptability Limits[1]: 73 - 129 %

GTEL No.	Expected Result, ug/L	Surrogate Result, ug/L	Surrogate Recovery, %
Blank	200	168	84
01	200	190	95
02	200	157	78
03	200	168	84
04	200	170	85
05	200	197	98
06	200	171	86
07	200	178	89
08	200	162	81
09	200	159	80
10	200	146	73
11	200	160	80
MS	200	178	89
WS	200	153	76
WSD	200	157	78

MS = Matrix Spike
WS = Reagent Water Spike
WSD = Reagent Water Spike Duplicate
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

Table 5

MATRIX SPIKE (MS) RECOVERY REPORT

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 02/14/90 Client ID: 020-EA1
Sample Spiked: 07 Units: ug/L

Analyte	Sample Result	Concentration Added	Concentration Recovered	MS Result	MS, % Recovery	Acceptability Limits[1], %
Benzene	<0.3	25	25.9	25.9	104	73 - 119
Toluene	<0.3	25	24.9	24.9	100	72 - 118
Ethylbenzene	<0.3	25	25.1	25.1	100	78 - 115
Xylene (total)	<0.6	75	74.6	74.6	99	84 - 116

<# = Not detected at the indicated detection limit.
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72
Consultant Project Number: 4-418-01
Contract Number: N46CWC0244-9-X
Facility Number: 91026
Work Order Number: D002243
Report Issue Date: February 22, 1990

Table 6

REAGENT WATER SPIKE (WS) AND REAGENT WATER SPIKE DUPLICATE (WSD)
RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD) REPORT

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 02/14/90 Units: ug/L

Analyte	Concentration Added	WS Result	WS, % Recovery	WSD Result	WSD, % Recovery
Benzene	25	24.1	96	23.7	95
Toluene	25	23.6	94	23.2	93
Ethylbenzene	25	23.9	96	22.8	91
Xylene (total)	75	72.5	97	71.7	96

Analyte	RPD, %	Acceptability Limits[1]	
		Maximum RPD, %	% Recovery
Benzene	1	30	85 - 131
Toluene	1	30	82 - 124
Ethylbenzene	5	30	81 - 121
Xylene (total)	1	30	87 - 125

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Well Location

Ground water monitoring wells generally fall into one of following classifications relative to the suspected hydrocarbon source:

1) Clean up- and cross-gradient wells,

2) Clean down-gradient wells,

3) High concentration source-area wells, and

4) Low to high concentration intermediate wells.

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

1) If no offsite source is indicated by the initial sampling of the up-gradient and cross-gradient site wells and the subject wells are clean, WA recommends sampling these wells annually.

2) Since clean down-gradient wells define the "leading edge" of dissolved hydrocarbons in ground water, and hence are used to determine hydrocarbon breakthrough and the need for additional wells and/or remediation, WA recommends sampling these wells quarterly.

3) High concentration source-area wells are used to monitor stable or increasing source-area concentrations and the effectiveness of natural biodegradation. WA recommends sampling these wells semi-annually unless the hydrocarbon concentrations are found to be increasing, in which case, the wells will be sampled quarterly. High concentration source wells with a history of floating hydrocarbons will be inspected quarterly, and sampled if possible.

4) Intermediate wells, located at a distance from the source area, may contain low to high dissolved hydrocarbon concentrations, depending on their distance from the source and hydrogeologic factors. Although these wells are not used to track the migration of the dissolved-hydrocarbon front, they can be used to track the migration of the dissolved hydrocarbon plume and the rates of natural biodegradation. Therefore, WA recommends sampling these wells semi-annually.