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

91 MAR -7 AM 11:37

TRANSMITTAL LETTER

FROM: Tom Fojut

DATE: March 5, 1991

TO: Paul Smith
Alameda County Department
of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621-1426

VIA:
- [X] First Class Mail
- [ ] Fax ___ pages
- [ ] UPS (Surface)
- [ ] Federal Express
- [ ] Courier

SUBJECT: Shell Service Station
29 Wildwood Avenue
Piedmont, California

JOB: 81-463-01

AS:
- [ ] We discussed on the telephone on _____
- [ ] You requested _____
- [ ] We believe you may be interested
- [X] Is required

WE ARE SENDING:
- [X] Enclosed
- [ ] Under Separate Cover Via _____

Quarterly status report for the subject site

FOR:
- [ ] Your information
- [X] Your use
- [ ] Your review & comments
- [ ] Return to you

PLEASE:
- [X] Keep this material
- [ ] Return within 2 weeks
- [ ] Acknowledge receipt

MESSAGE: Please call if you have any questions.

D:\ALL\TRANS\JA1.WP

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

91 MAR -7 AM 11:31

March 5, 1991

Paul Smith
Alameda County Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621-1426

Re: Shell Service Station
WIC #204-6001-0109
29 Wildwood Avenue
Piedmont, California
WA Job #81-463-01

Dear Mr. Smith:

This letter describes Weiss Associates' (WA) first quarter 1991 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 to date in the first quarter 1991, and
- Proposed work for the remainder of the first quarter 1991 and the second quarter 1991.

FIRST QUARTER 1991 ACTIVITIES

During this quarter, WA:

- Collected ground water samples from all six ground water monitoring wells,
- Measured ground water depths in the wells and determined ground water elevations and flow direction,
- Analyzed the ground water samples for hydrocarbons and tabulated the analytic results, and

- Evaluated the site for sampling frequency modifications.

These activities are described below.

Ground Water Sampling

WA collected ground water samples from all six wells on January 31, 1991, as part of the quarterly ground water monitoring program at Shell Service Station WIC #204-6001-0109 in Piedmont, California. Ground water samples from monitoring well MW-3 (Figure 2) contained benzene above the California Department of Health Services (DHS) maximum contaminant level (MCL) for drinking water.

Sampling Personnel: WA Environmental Technicians David Charles and James Martin

Monitoring Wells Sampled: MW-1 through MW-5 and E-4

Method of Purging Wells:

	Wells
• Steam-cleaned PVC bailers	E-4
• Dedicated PVC bailers	MW-1 through MW-5

Volume of Water Purged Prior to Sampling:

- Wells MW-1 through MW-5 were purged of four well-casing volumes, about 13 to 31 gallons each.
- Well E-4 was purged dry; water level was allowed to recover for at least two hours prior to sampling.

Method of Collecting Ground Water Samples:

	Wells
• Decanted from a steam-cleaned Teflon bailer	E-4
• Drawn through the sampling ports on the sides of dedicated PVC bailers	MW-1 through MW-5

Methods of Containing Ground Water Samples:

- 40 ml glass volatile organic analysis (VOA) vials, preserved with hydrochloric acid and packed in protective foam sleeves

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

Water Samples Transported to:

- National Environmental Testing (NET) Pacific, Inc., Santa Rosa, California, and were received on February 1, 1991

Quality Assurance/Quality Control:

- A travel blank and a bailer blank were submitted for analysis.

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

Ground Water Elevations and Flow Direction

- The depth to water was measured in wells MW-1 through MW-5 on January 31, 1991. Ground water elevations increased slightly from the previous quarter in wells MW-1, MW-2 and MW-3 and decreased slightly in wells MW-4 and MW-5.

- Ground water flows westward to southwestward, which is consistent with the general flow pattern over the past year.

- The potentiometric surface of flowing artesian well E-4 was greater than 4.5 ft above the top-of-casing in July 1989. This well is screened in a deeper water bearing zone than the other wells.

Depth to water measurements and ground water elevations are presented in Table 1. Ground water elevation contours are plotted on Figure 2. Previous ground water elevation contour maps are included in Attachment C.

Chemical Analyses

The Ground Water Samples were Analyzed for:

- Total petroleum hydrocarbons as gasoline (TPH-G) by Modified EPA Method 8015, and
- Benzene, ethylbenzene, toluene and xylenes (BETX) by EPA Method 602.

The laboratory analyzed the samples on February 7 and 8, 1991. The results are presented in Table 2 and the analytic reports are included in Attachment B.

Discussion of Ground Water Analytic Results for this Quarter:

- Water samples from monitoring well MW-3 contained benzene above the DHS MCL for drinking water.
- No BETX or TPH-G were detected in samples from wells MW-1 and E-4.
- A non-fuel compound was detected by Modified EPA Method 8015 at or slightly above laboratory detection limits in samples from wells MW-1 and MW-5. NET Pacific speculated that the non-fuel compound could be a purgeable halocarbon.[1] WA will analyze for purgeable halocarbons by EPA Method 601 in the second quarter 1991.
- Hydrocarbon concentrations in samples from wells MW-2 and MW-3 were consistent with previous results.

Sampling Frequency Modification

WA has developed criteria to determine when the ground water sampling frequency can be modified for ground water monitoring programs (Attachment D). Based on these criteria, WA recommends modifying the sampling frequency of the site wells as shown in Table 3. Subject to your approval, WA will initiate this program for the next quarterly sampling, scheduled in April 1991.

[1]Telephone conversation between Thomas Fojut, WA Staff Geologist and Linda DeMartino, NET Pacific, March 1, 1991.

ANTICIPATED WORK FOR SECOND QUARTER 1991

During the remainder of the first quarter 1991 and the second quarter 1991, on behalf of Shell Oil, WA plans to:

- Continue quarterly monitoring of ground water at this site,
- Prepare a quarterly status report presenting all data generated during the previous quarter including water sampling results and analysis, and
- Pursue WA's recommendations for sampling frequency modifications.

We trust that this submittal satisfies your requirements. Please contact Tom Fojut or Scott MacLeod if you have any questions.

Sincerely,
Weiss Associates

Thomas Fojut

Thomas J. Fojut
Staff Geologist

J. P. Theisen

Joseph P. Theisen, R.G.
Senior Project Hydrogeologist

REGISTERED GEOLOGIST
JOSEPH P. THEISEN
No. 4981
STATE OF CALIFORNIA

TJF/JPT:jg

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Figures
Tables
Attachments:
A - Water Sample Collection Records
B - Analytic Reports and Chain-of-Custody Form
C - Previous Ground Water Elevation Contour Maps
D - Sampling Frequency Modification Criteria

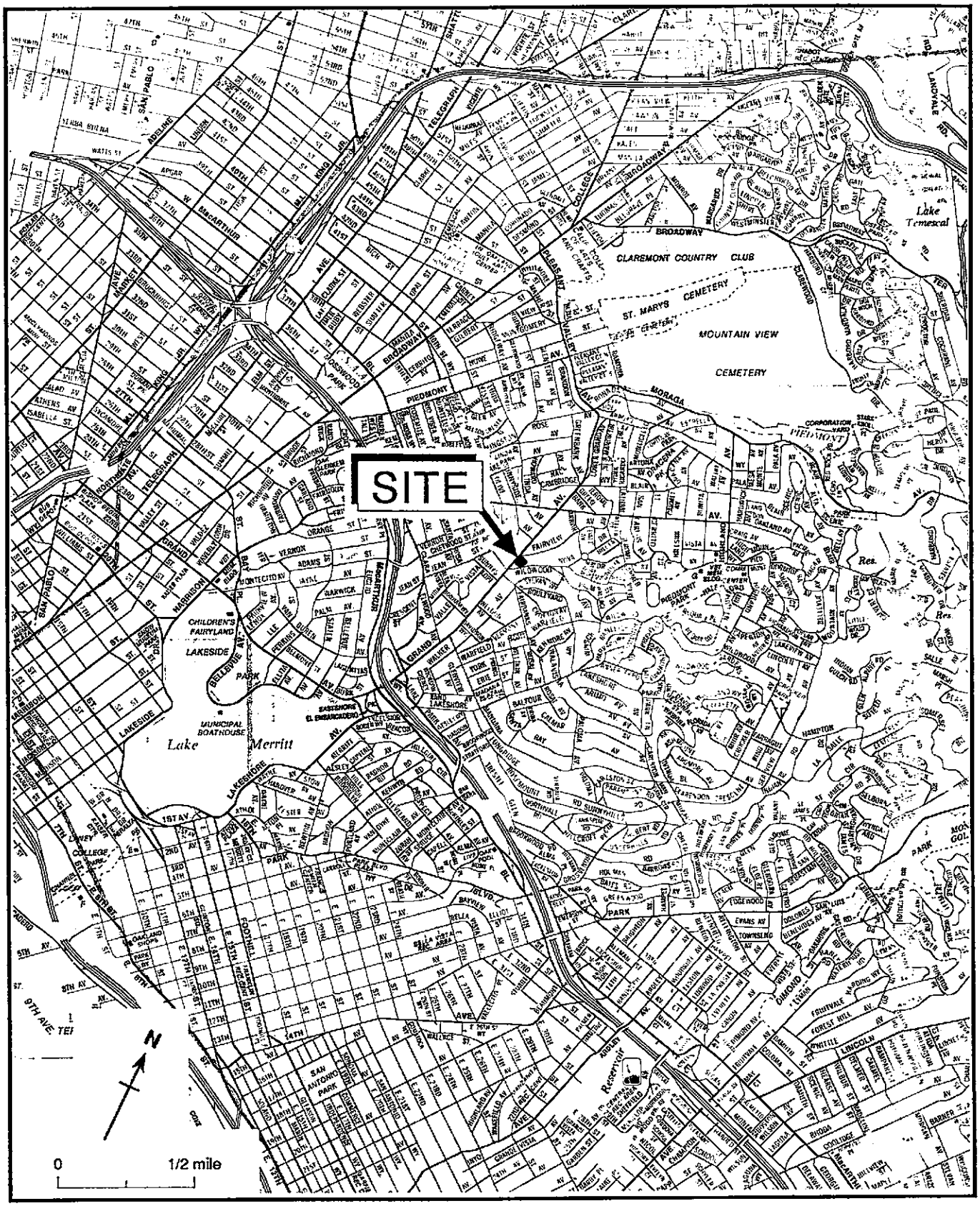

Figure 1. Site Location Map - Shell Service Station WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

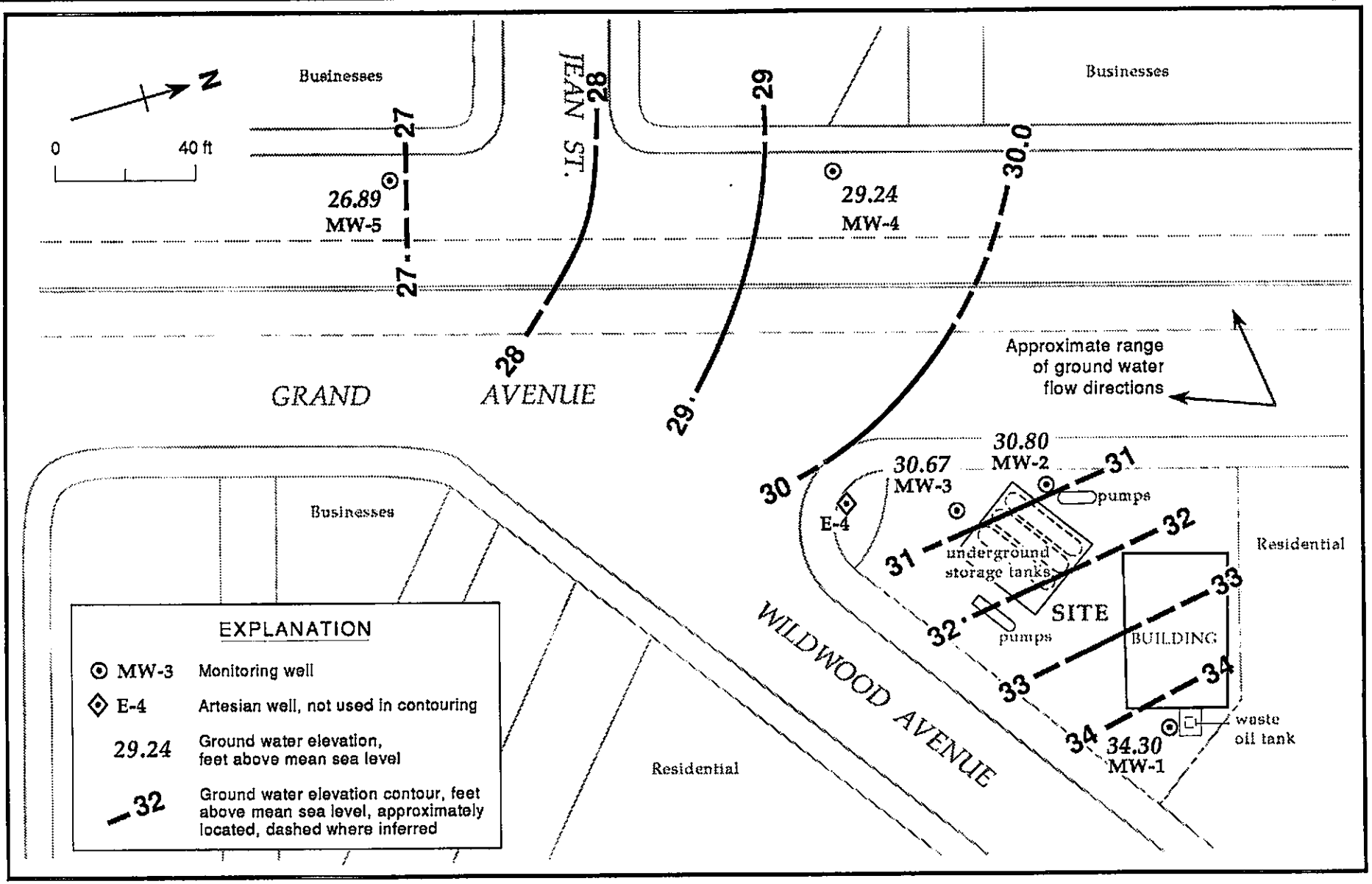

Figure 2. Ground Water Elevation Contours - January 31, 1991 - Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

3/4/91

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

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground water Elevation (ft above msl)
MW-1	07/12/89	37.96	2.76	35.20
	01/30/90		3.10	34.86
	04/27/90		3.24	34.72
	07/31/90		4.26	33.70
	10/30/90		4.25	33.71
	01/31/91		3.66	34.30
MW-2	07/12/89	34.89	3.66	31.23
	01/30/90		3.49	31.40
	04/27/90		3.79	31.10
	07/31/90		4.03	30.86
	10/30/90		4.21	30.68
	01/31/91		4.09	30.80
MW-3	07/12/89	35.00	3.83	31.17
	01/30/90		3.24	31.76
	04/27/90		4.02	30.98
	07/31/90		4.31	30.69
	10/30/90		4.52	30.48
	01/31/91		4.33	30.67
MW-4	01/30/90	33.73	4.50	29.23
	04/27/90		3.62	30.11
	07/31/90		4.19	29.54
	10/30/90		4.19	29.54
	01/31/91		4.49	29.24
MW-5	01/30/90	31.38	7.12	24.26
	04/27/90		4.19	27.19
	07/31/90		4.09	27.29
	10/30/90		4.39	26.99
	01/31/91		4.49	26.89
E-4	07/12/89	34.63	[a]	>39.13
	01/30/90		[b]	>34.63
	04/27/90		[b]	>34.63
	07/31/90		[b]	>34.63
	10/30/90		[b]	>34.63
	01/31/91		[b]	>34.63

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

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

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

Well ID	Date Sampled	Analytical Laboratory	Depth to Water (ft)	TPH-G	B	E	T	X	VOCs
				<---------- parts per million (mg/L) ---------->					
MW-1	07/12/89	IT	2.76	<0.050	<0.0005	<0.001	<0.001	<0.003	ND
	01/30/90	NET	3.10	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	NET	3.24	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	NET	4.26	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	NET	4.25	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	NET	3.66	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
MW-2	07/12/89	IT	3.66	0.060	0.0027	<0.001	<0.001	<0.003	ND
	01/30/90	NET	3.49	<0.050	0.0066	0.00054	<0.0005	0.00093	---
	04/27/90	NET	3.79	0.060	0.0021	<0.0005	<0.0005	<0.0005	---
	07/31/90	NET	4.03	0.070	0.0015	<0.0005	<0.0005	<0.0005	---
	10/30/90	NET	4.21	0.070	<0.0005	<0.0005	0.0007	0.0016	---
	01/31/91	NET	4.09	0.080	<0.0005	0.0009	<0.0005	0.0019	---
MW-3	07/12/89	IT	3.83	3.9	0.38	0.099	0.041	0.030	a
	01/30/90	NET	3.24	5.5	0.44	0.079	0.035	0.13	---
	04/27/90	NET	4.02	4.5	0.31	0.037	0.026	0.11	---
	07/31/90	NET	4.31	3.5	0.21	0.0084	0.017	0.062	---
	10/30/90	NET	4.52	2.3	0.061	<0.0005	<0.0005	0.028	---
	01/31/91	NET	4.33	4.1	0.30	0.019	0.020	0.081	---
MW-4	01/31/90	NET	4.50	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	NET	3.62	0.13[b]	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	NET	4.19	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	NET	4.19	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	NET	4.49	0.050[b]	<0.0005	<0.0005	<0.0005	<0.0005	---
MW-5	01/31/90	NET	7.12	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	NET	4.19	0.21[b]	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	NET	4.09	0.090	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	NET	4.39	0.10	0.0008	0.0006	0.0007	0.0014	---
	01/31/91	NET	4.49	0.080[b]	<0.0005	<0.0005	<0.0005	<0.0005	---
E-4	07/12/89	IT	c	<0.050	<0.0005	<0.001	<0.001	<0.003	ND
	01/31/90	NET	c	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	NET	c	0.12[b]	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	NET	c	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	NET	c	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	NET	c	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---

-- Table 2 continues on next page --

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

Well ID	Date Sampled	Analytical Laboratory	TPH-G	B	E	T	X	VOCs
			<---------- parts per million (mg/L) ---------->					
Trip Blank	07/12/89	IT	<0.050	<0.0005	<0.001	<0.001	<0.003	---
	01/31/90	NET	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	04/27/90	NET	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	07/31/90	NET	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	10/30/90	NET	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	NET	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
Bailer Blank	04/27/90	NET	0.11[b]	<0.0005	<0.0005	<0.0005	<0.0005	---
	01/31/91	NET	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	---
DHS MCLs			NE	0.0010	0.68	0.10[d]	1.75	

Abbreviations:

TPH-G = Total Petroleum Hydrocarbons as Gasoline by Modified EPA Method 8015
B = Benzene by EPA Method 602 or 8020
E = Ethylbenzene by EPA Method 602 or 8020
T = Toluene by EPA Method 602 or 8020
X = Xylenes by EPA Method 602 or 8020
VOCs = Volatile Organic Compounds by EPA Method 624
ND = Not detected at detection limits of 0.0005 to 0.010 parts per million
--- = Not analyzed for these compounds
NE = DHS MCL not established
DHS MCLs = California Department of Health Services, maximum contaminant levels for drinking water
<n = Not detected at detection limit of n ppm

Notes:

[a] = BETX detected at 0.41, 0.097, 0.036 and 0.30 parts per million, respectively by EPA Method 624
[b] = Non-fuel peak reported as TPH-G by Modified EPA Method 8015
[c] = Artesian well; ground water elevation above top-of-casing elevation
DHS Recommended Action Level for drinking water, MCL not established

Analytical Laboratory:

IT = International Technology Analytical Services Inc., San Jose, California
NET = National Environmental Testing (NET) Pacific, Inc., Santa Rosa, California

Table 3. Recommended Modifications to Ground Water Sampling Schedule, Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

Well ID	Current Sampling Frequency	Recommended Future Sampling Frequency	Rationale for Recommended Sampling Frequency
MW-1	Quarterly	Annually	No hydrocarbons detected for five consecutive quarters; up-gradient well
MW-2	Quarterly	Semi-Annually	Low hydrocarbon concentrations detected for five consecutive quarters; source area well
MW-3	Quarterly	Semi-Annually	Stable hydrocarbon concentrations detected for five consecutive quarters; source area well
MW-4	Quarterly	Quarterly	Down-gradient monitoring well
MW-5	Quarterly	Quarterly	Down-gradient monitoring well
E-4	Quarterly	Semi-Annually	No verified hydrocarbons detected for five consecutive quarters; down-gradient well in a deeper water-bearing zone

ATTACHMENT A

WATER SAMPLE COLLECTION RECORDS

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name MW-1 Date 1/31/91 Time of Sampling 1514
Job Name Shell Pleasant Job Number SI-963.01 Initials CM
Sample Point Description M (M = Monitoring Well)
Location E side of station - uphill well

WELL DATA: Depth to Water 5.66 ft (static, pumping) Depth to Product NA ft.
Product Thickness NA Well Depth 15 ft (spec) Well Depth ____ ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 11.34 ft. = volume 7.41 gal.
4 Casing Volumes to be Evacuated. Total to be evacuated 30 gal.

EVACUATION METHOD: Pump # and type NA Hose # and type NA
Bailer# and type 3x36 PVC Dedicated Yes (Y/N)
Other NA

Evacuation Time: Stop 1450 1502 1507
Start 1441 1457 1505
Total Evacation Time 9 5 2 min
Total Evacuated Prior to Sampling 31 gal.
Evacuation Rate ____ gal. per minute
Depth to Water during Evacuation NA ft. NA time
Depth to Water at Sampling 7.16 ft. 1516 time
Evacuated Dry? Yes After 19 gal. Time 1450
80% Recovery = * CONT'D. BAILING UNTIL 4 CVS.
% Recovery at Sample Time ____ Time VOLS. PURGED

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.)
			NA		

SAMPLE: Color None Odor None
Description of matter in sample: very fine amount of clear fine sand
Sampling Method: Port on dedicated bailer
Sample Port: Rate NA gpm Totalizer NA gal.
Time NA

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	011-1	W/CV	40ml	N	Y	NONE	EPA 8015/8020	N	NET

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 MW-2 Date 1/31/91 Time of Sampling 1549
Job Name Shell Piedmont Job Number 81-463-01 Initials VMM
Sample Point Description M (M = Monitoring Well)
Location Near Pumps Along Grand Ave

WELL DATA: Depth to Water 4.09 ft (static, pumping) Depth to Product θ ft.
Product Thickness θ Well Depth 12 ft (spec) Well Depth 11.60 ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 7.51 ft. = volume 4.9 gal.
4 Casing Volumes to be Evacuated. Total to be evacuated 19.6 gal.

EVACUATION METHOD: Pump # and type NA Hose # and type NA
Bailer# and type 3 x 36" PVC Dedicated yes (Y/N)
Other NA

Evacuation Time: Stop 1356 1437 1530
Start 1353 1435 1522
Total Evacuation Time 12 min
Total Evacuated Prior to Sampling 20 gal.
Evacuation Rate 1.6 gal. per minute
Depth to Water during Evacuation NA ft. NA time
Depth to Water at Sampling 8.11 ft. 1551 time
Evacuated Dry? YES After 7 gal. Time 1356
80% Recovery = 5.60 DTW * CONT'D BAILING UNTIL
% Recovery at Sample Time 49% Time 4 CAS VOLS. PURGED

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: NA

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

SAMPLE: Color none Odor none
Description of matter in sample: none
Sampling Method: Post on dedicated bailer
Sample Port: Rate NA gpm Totalizer NA gal.
Time NA

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	011-2	W/CV	40ml	N	Y	NONE	EPA 8015/8020	N	NET

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:

F:\ALL\ADMIN\FORMS\WATSAMP.WP

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name MW-3 Date 1/3/91 Time of Sampling 1600
Job Name SHELL CORP-UNI Job Number 51-416 Initials DK
Sample Point Description MW-3 (M = Monitoring Well)
Location MID LOT

WELL DATA: Depth to Water 4.33 ft (static, pumping) Depth to Product -0- ft.
Product Thickness -0- Well Depth 9 ft (spec) Well Depth 9.10 ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 4.77 ft. = volume 3.1 gal.
5 Casing Volumes to be Evacuated. Total to be evacuated 12.5 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 3X3L PVC Dedicated YES (Y/N)
Other —

Evacuation Time: Stop 1406 1442 1538
Start 1404 1439 1537
Total Evacuation Time 6 mins.
Total Evacuated Prior to Sampling 13 gal.
Evacuation Rate 2.1 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling 4.43 ft. 1616 time
Evacuated Dry? YES After 4 gal. Time 1406
80% Recovery = 5.29 DTW * CONT'D BAILING UNTIL 4
% Recovery at Sample Time — Time CONS. VOLS. PURGED

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 LT. TO MED. GAS/GASOLINE
Description of matter in sample: NONE
Sampling Method: FROM DED. BAILER
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	MW-3	V/cV	40mL	N	Y	NONE	EPA 8015/8020	N	NET

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 MW-4 Date 1/31/90 Time of Sampling 1555
Job Name SHELL PIEDMONT Job Number 8-463-01 Initials DK
Sample Point Description M (M = Monitoring Well)
Location ACROSS GRAND FROM SHELL

WELL DATA: Depth to Water 4.59 ft (static, pumping) Depth to Product — ft.
Product Thickness — Well Depth 16 ft (spec) Well Depth 12.17 ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 7.65 ft. = volume 5.0 gal.
1 Casing Volumes to be Evacuated. Total to be evacuated 20.0 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 3X36 PVC Dedicated YES (Y/N)
Other —

Evacuation Time: Stop 1422 1454 1515
Start 1418 1451 1506
Total Evacation Time 4 MIN
Total Evacuated Prior to Sampling 20 gal.
Evacuation Rate 2.2 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling N/A ft. — time
Evacuated Dry? YES After 7.5 gal. Time 1422
80% Recovery = 6.07
% Recovery at Sample Time — Time
* CONTD BAILING UNTIL 4 CASINGS PURGED

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: VERY FINE SAND/SILT IN SMALL AMT
Sampling Method: FROM PORT ON PERI. PUMP
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	DUP-1	W/CV	40mL	N	Y	NONE	EPA 8015/8020	N	NET
					1				

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 (spelt)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

ATTACHMENT B

ANALYTIC RESULTS AND CHAIN-OF-CUSTODY FORM

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Tom Fojut
Weiss Associates
5500 Shellmound St.
Emeryville, CA 94608

Date: 02-13-91
NET Client Acct No: 18.09
NET Pacific Log No: 5923
Received: 02-01-91 2300

Client Reference Information

SHELL- 29 Wildwood Ave., Piedmont, Project: 81-463-01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

JS:rct
Enclosure(s)

NET Pacific, Inc.

Client No: 18.09 Date: 02-13-91
Client Name: Weiss Associates
NET Log No: 5923 Page: 2

Ref: SHELL- 29 Wildwood Ave., Piedmont, Project: 81-463-01

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 011-1 01-31-91 73975	011-2 01-31-91 73976	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-07-91	02-08-91	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	0.08	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-07-91	02-08-91	
Benzene		0.5	ND	ND	ug/L
Ethylbenzene		0.5	ND	0.9	ug/L
Toluene		0.5	ND	ND	ug/L
Xylenes, total		0.5	ND	1.9	ug/L

NET Pacific, Inc.

Client No: 18.09 Date: 02-13-91
Client Name: Weiss Associates
NET Log No: 5923 Page: 3

Ref: SHELL- 29 Wildwood Ave., Piedmont, Project: 81-463-01

			Descriptor, Lab No. and Results		
			011-3 01-31-91	011-4 01-31-91	
Parameter	Method	Reporting Limit	73977	73978	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			10	1	
DATE ANALYZED			02-07-91	02-07-91	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	4.1	0.05 *	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			10	1	
DATE ANALYZED			02-07-91	02-07-91	
Benzene		0.5	300	ND	ug/L
Ethylbenzene		0.5	19	ND	ug/L
Toluene		0.5	20	ND	ug/L
Xylenes, total		0.5	81	ND	ug/L

* NOTE: Not gasoline, result due to large unidentified peak.

NET Pacific, Inc.

Client No: 18.09
Client Name: Weiss Associates
NET Log No: 5923

Date: 02-13-91
Page: 4

Ref: SHELL- 29 Wildwood Ave., Piedmont, Project: 81-463-01

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 011-E4 01-31-91 73979	011-5 01-31-91 73980	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-07-91	02-07-91	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	0.08 *	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-07-91	02-07-91	
Benzene		0.5	ND	ND	ug/L
Ethylbenzene		0.5	ND	ND	ug/L
Toluene		0.5	ND	ND	ug/L
Xylenes, total		0.5	ND	ND	ug/L

* NOTE: Not gasoline, result due to large unidentified peak.

NET Pacific, Inc.

Client No: 18.09 Date: 02-13-91
Client Name: Weiss Associates
NET Log No: 5923 Page: 5

Ref: SHELL- 29 Wildwood Ave., Piedmont, Project: 81-463-01

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 011-21 01-31-91 73981	011-22 01-31-91 73982	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-07-91	02-07-91	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	ND	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-07-91	02-07-91	
Benzene		0.5	ND	ND	ug/L
Ethylbenzene		0.5	ND	ND	ug/L
Toluene		0.5	ND	ND	ug/L
Xylenes, total		0.5	ND	ND	ug/L

NET Pacific, Inc.

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
*	:	Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).
ICVS	:	Initial Calibration Verification Standard (External Standard).
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 16th Edition, APHA, 1985.

WEISS ASSOCIATES
5500 Shellmound St., Emeryville, CA 94608
Phone: 415-547-5420 FAX: 415-547-5043

Shell Service Station Address: 29 WILDWOOD AVENUE PIEDMONT, CA
Shell Contact: KURT MILLER
WIC #: 204-6001-0109
AFE #:

Please send analytic results and a copy of the signed chain of custody form to:
TOM FOJUT
(5923)
Project ID: 81-463-01

CHAIN-OF-CUSTODY RECORD AND ANALYTIC INSTRUCTIONS

Lab Personnel:
1) Specify analytic method and detection limit in report.
2) Notify us if there are any anomalous peaks on GC or other scans.
3) ANY QUESTIONS/CLARIFICATIONS: CALL US.

Sampled by: D.C. & J.M.
Laboratory Name: NET

No. of Containers	Sample ID	Container Type[1]	Sample Date	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analyze for	Analytic Method	Turn[5]	COMMENTS
3	011-1	w/cV	1/31/91	40ml	N	Y	NONE	GAS/BETX	EPA 8015/8020	N	
	011-2										
	011-3										
	011-4										
	011-EH										
	011-5										
	011-21										
	011-22										

1 David Charles 1/31/91 17:45
Released by (Signature), Date
1 Weiss Assoc.
Affiliation

2 [signature] 2/1/91 900
Received by (Signature), Date
2 Weiss Assoc.
Affiliation

3 [signature] 2/1/91 11:50
Released by (Signature), Date
3 WA
Affiliation

4 [signature] 2/1
Shipping Carrier, Method, Date
4 NET 11:50
Affiliation

5 [signature] 2/1
Released by (Signature), Date
5 NET 13:00
Affiliation

6 [signature] 2/1/91 2300
Received by Lab Personnel, Date
6 NET
Affiliation, Telephone

Seal intact? yes

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 (write out)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:
Released to Secure, locked area overnight

ATTACHMENT C

PREVIOUS GROUND WATER ELEVATION CONTOUR MAPS

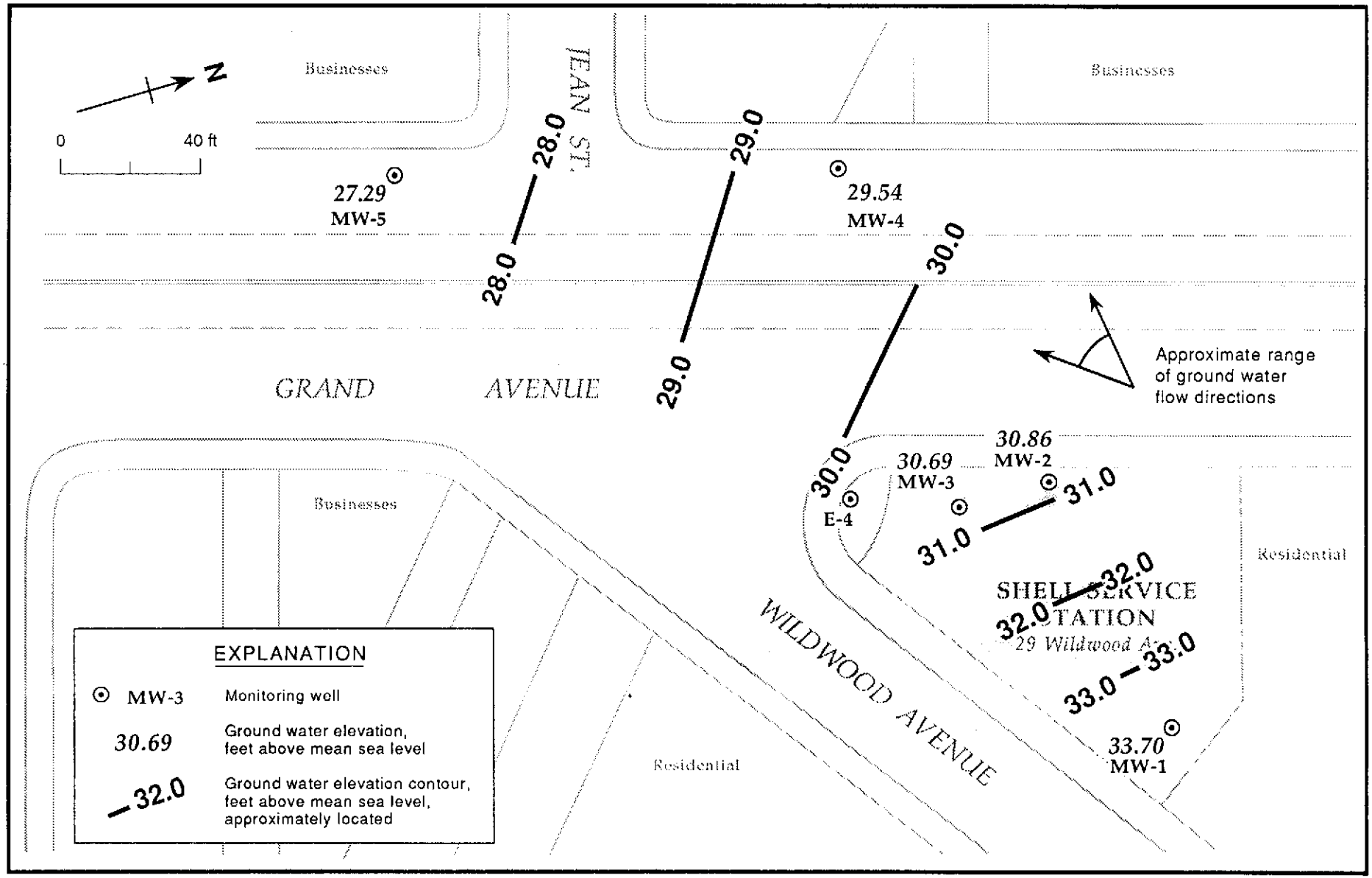

Figure 5. Ground Water Elevation Contours - July 31, 1990 - Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

1/14/91

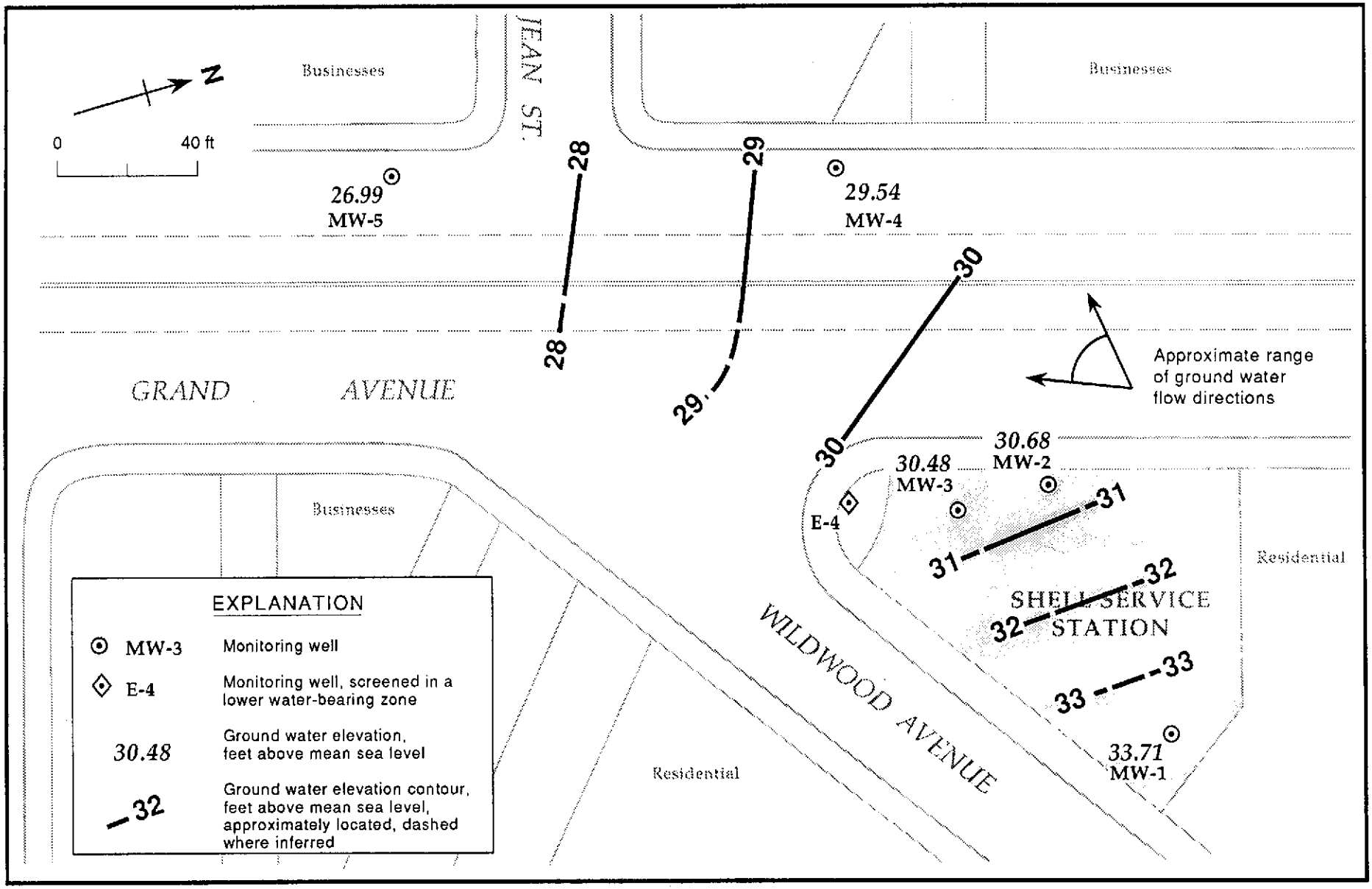

Figure 2. Monitoring Well and Ground Water Elevation Contours - October 30, 1990 - Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

12/4/90

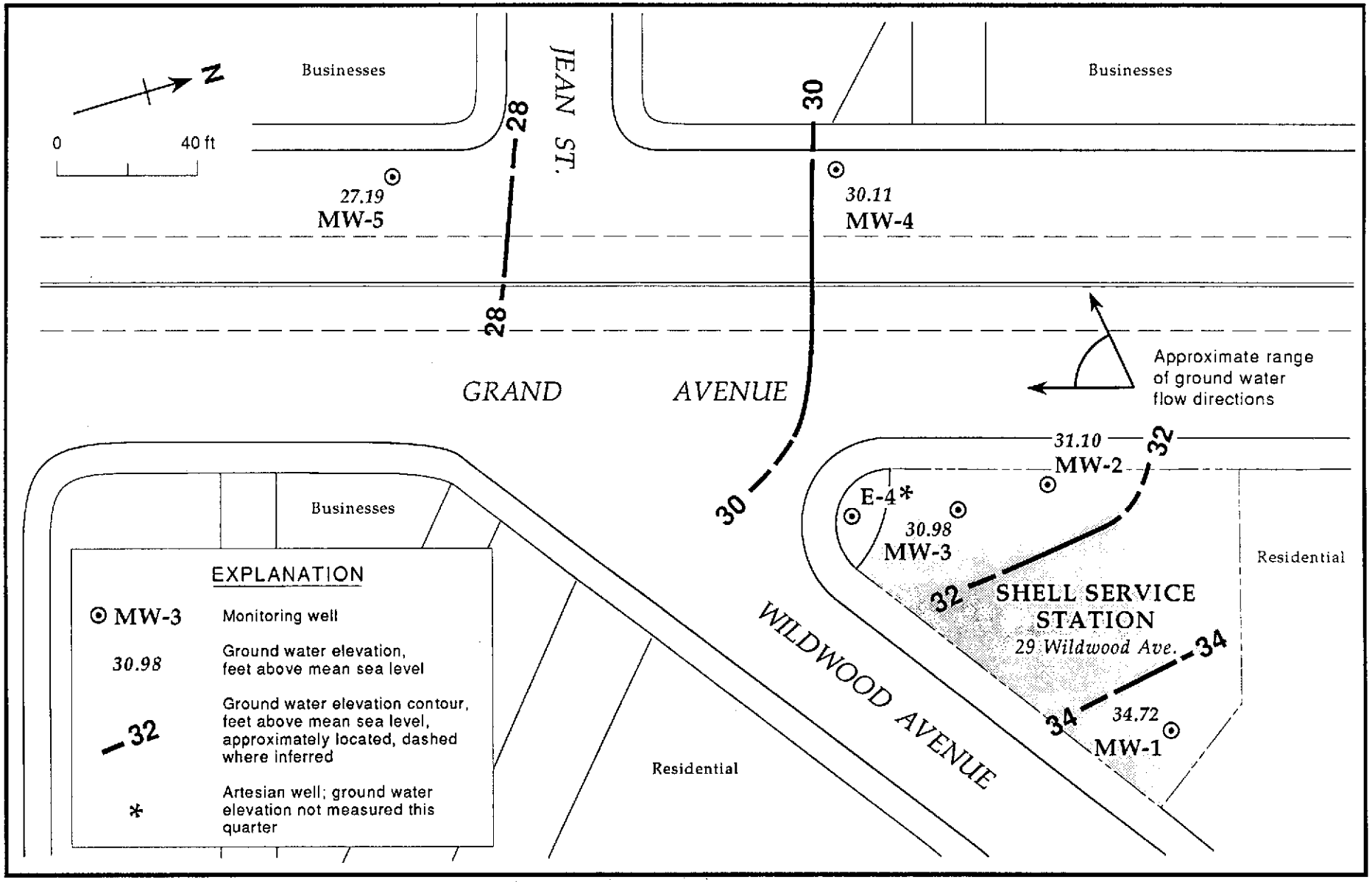

Figure 5. Ground Water Elevation Contours - April 27, 1990 - Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

1/14/91

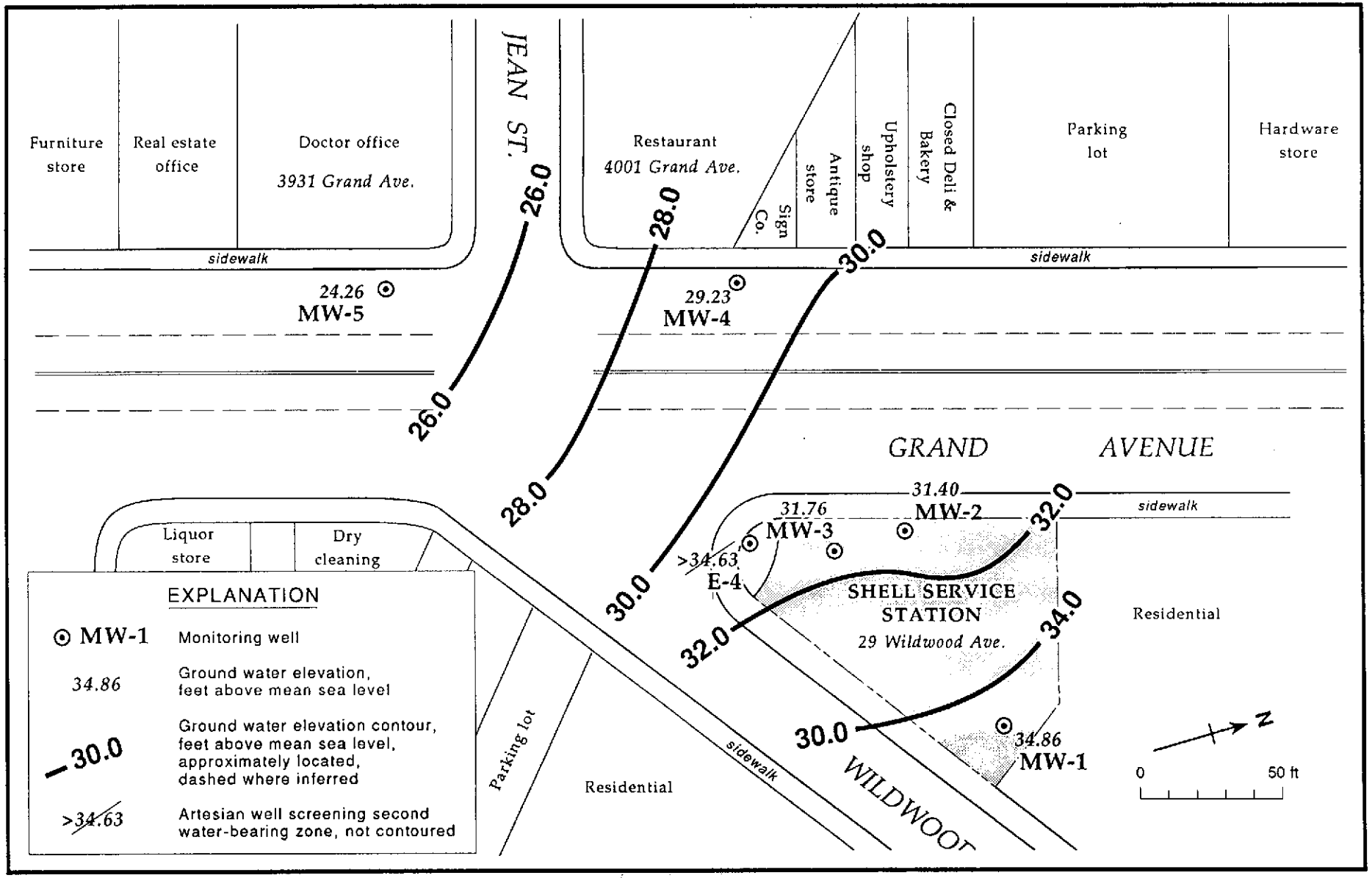

Figure 3. Monitoring Well Locations and Ground Water Elevation Contours - January 30, 1990 - Shell Service Station, WIC #204-6001-0109, 29 Wildwood Avenue, Piedmont, California

1/14/91

ATTACHMENT D

SAMPLING FREQUENCY MODIFICATION CRITERIA

ATTACHMENT D

SAMPLING FREQUENCY MODIFICATION CRITERIA

Shell 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"[2]. 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. Therefore, WA has developed generalized criteria for determining when sampling frequency can 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 water samples from 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 elevation fluctuations can also affect hydrocarbon concentrations in ground water. Therefore, WA will reduce the sampling frequency only for wells that:

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

---

2 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.

Trend of Hydrocarbon Concentration

Sampling frequency will be reduced only for wells showing stable or decreasing hydrocarbon concentrations. Wells with increasing concentration 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) for drinking water or a California Department of Health Services action level.

Well Location

Ground water monitoring wells generally fall into one of the 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 recommends the following sampling frequency for each of these classifications:

1) If no offsite source is indicated by the initial sampling of the up-gradient and cross-gradient site wells, and if no hydrocarbons are detected in water samples from the wells, 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 monitor hydrocarbon breakthrough, WA recommends sampling these wells quarterly.

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

4) Intermediate wells are located at a distance from the source area and 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.

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name MW-5 Date 1/31/91 Time of Sampling 1524
Job Name SHELL PLEASANT Job Number 81-463-01 Initials DC
Sample Point Description M (M = Monitoring Well)
Location IN STREET W. BOUND GRAND AVE NEAR BUS STOP

WELL DATA: Depth to Water 4.49 ft (static, pumping) Depth to Product 0 ft.
Product Thickness 0 Well Depth ___ ft (spec) Well Depth 16.0 ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 11.53 ft. = volume 7.53 gal.
4 Casing Volumes to be Evacuated. Total to be evacuated 30.1 gal.

EVACUATION METHOD: Pump # and type ___ Hose # and type ___
Bailer# and type 3x36 PVC Dedicated YES (Y/N)
Other ___

Evacuation Time: Stop 1518
Start 1504
Total Evacation Time 14 MIN
Total Evacuated Prior to Sampling 30 gal.
Evacuation Rate 2.1 gal. per minute
Depth to Water during Evacuation ___ ft. ___ time
Depth to Water at Sampling 6.19 ft. 1525 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: VERY FILE SAND / COARSE SILT
Sampling Method: FROM PORT ON DED. BLR.
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	011-5	w/cV	40ml	N	Y	NONE	EPA 8015/8020	N	NET

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 E-4 Date 1/31/91 Time of Sampling 1629
Job Name SHELL PIEDMONT Job Number 21-2163-01 Initials DC/SMG
Sample Point Description M (M = Monitoring Well)
Location Corner of Grand & Wildwood

WELL DATA: Depth to Water 20 ft (static, pumping) Depth to Product 0 ft.
Product Thickness 0 Well Depth 34.26 ft (spec) Well Depth ____ ft(sounded) Well Diameter 3 in
Initial Height of Water in Casing 34.26 ft. = volume 12.5 gal.
4 Casing Volumes to be Evacuated. Total to be evacuated 50.3 gal.

EVACUATION METHOD: Pump # and type ____ Hose # and type ____
Bailer# and type 3/8 X 1/8 PVC Dedicated NO (Y/N)
Other ____

Evacuation Time: Stop 1343
Start 1333
Total Evacation Time 10 min
Total Evacuated Prior to Sampling 20 gal.
Evacuation Rate 2 gal. per minute
Depth to Water during Evacuation NA ft. NA time
Depth to Water at Sampling 16.78 ft. 1627 time
Evacuated Dry? YES After 20 gal. Time 1343
80% Recovery = 16.86 ATW
% Recovery at Sample Time 45 % Time 1627

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.)
		NF			

SAMPLE: Color None Odor None
Description of matter in sample: Trace amount of fine silt
Sampling Method: Decanted from end of bailer # DD
Sample Port: Rate NA gpm Totalizer NA gal.
Time NA

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	OW-E4	W/CV	40ml	N	Y	None	EPA 8015/8020	N	NET

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:

TRAVEL BLANK

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name — Date 1/7/91 Time of Sampling 1630
Job Name (WELL DEVELOPMENT) Job Number [illegible] Initials CK
Sample Point Description ______ (M = Monitoring Well)
Location ______

WELL DATA: Depth to Water ______ ft (static, pumping) Depth to Product ______ ft.
Product Thickness ______ Well Depth ______ ft (spec) Well Depth ______ ft(sounded) Well Diameter ______ in
Initial Height of Water in Casing ______ ft. = volume ______ gal.
______ Casing Volumes to be Evacuated. Total to be evacuated ______ gal.

EVACUATION METHOD: Pump # and type ______ Hose # and type ______
Bailer# and type ______ Dedicated ______ (Y/N)
Other ______

Evacuation Time: Stop ______ ______ ______
Start ______ ______ ______
Total Evacuation Time ______ N/P
Total Evacuated Prior to Sampling ______ gal.
Evacuation Rate ______ gal. per minute

Depth to Water during Evacuation ______ ft. ______ time
Depth to Water at Sampling ______ ft. ______ time
Evacuated Dry? ______ 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 NONE Odor NONE
Description of matter in sample: NONE
Sampling Method: ______
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	01-21	W/CV	40mL	N	Y	NONE	EPA 8015/8020	N	NET

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:

F:\ALL\ADMIN\FORMS\WATSAMP.WP

Bailer Blank

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name _____ Date 1/31/91 Time of Sampling 1605

Job Name Shell Piedmont Job Number 31-463-01 Initials JM

Sample Point Description M (M = Monitoring Well)

Location _____

WELL DATA: Depth to Water _____ ft (static, pumping) Depth to Product _____ ft.

Product Thickness _____ Well Depth ____ ft (spec) Well Depth _____ ft(sounded) Well Diameter ____ in

Initial Height of Water in Casing _____ ft. = volume _____ gal.

_____ Casing Volumes to be Evacuated. Total to be evacuated _____ gal.

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

Bailer# and type _____ Dedicated _____ (Y/N)

Other _____

Evacuation Time: Stop _____ _____ _____

Start _____ _____ _____

Total Evacation Time _____

Total Evacuated Prior to Sampling _____ gal.

Evacuation Rate _____ gal. per minute

Depth to Water during Evacuation _____ ft. _____ time

Depth to Water at Sampling _____ ft. _____ time

Evacuated Dry? _____ 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.)

Approximately Distilled water = 4 gal plastic jug

SAMPLE: Color None Odor None

Description of matter in sample: None

Sampling Method: Decanted from end of Teflon bailer #DD

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	041-22	V/CV	40ml	N	Y	None	EPA 504/8010	N	NET

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: