Chevron U.S.A. Products Company
2410 Camino Ramon, San Ramon, California • Phone (510) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

October 20, 1992

Ms. Jennifer Eberle
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

Re: Former Chevron Service Station #9-0020
1633 Harrison, Oakland

Dear Ms. Eberle:

This letter is in response to your letter dated October 9, 1992, received in this office on October 15, 1992. The copies of the soil disposal receipts submitted to you on October 5, 1992, totaled 123 cubic yards, not 49 cubic yards as stated in your letter. The initial submittal of the receipts on August 26, 1992, totaled 49 cubic yards. This brings the total volume of soils disposed of at Redwood Landfill to 172 cubic yards. If these receipts are missing from your file, please contact me so additional copies can be provided to you.

Also enclosed is the Evaluation of Chlorinated Hydrocarbon Distribution letter report dated October 5, 1992, prepared by our consultant Geraghty & Miller, Inc. (GM). GM has evaluated the VOC distribution pattern from data compiled from the existing monitor wells and past remedial activities. The data outlined in this report substantiates that the **VOC's detected in the ground water beneath the site are emanating from an off-site source. Based on this assessment, Chevron will discontinue VOC analysis on all future ground water samples.** Chevron is committed to performing appropriate corrective actions to mitigate contamination caused by our past operations.

If you have any questions or comments, please do not hesitate to contact me at (510) 842-9581.

Very truly yours,
CHEVRON U.S.A. PRODUCTS COMPANY

Nancy Vukelich
Site Assessment and Remediation Engineer

Enclosures

cc: Mr. Rich Hiett, RWQCB-Bay Area
Ms. B.C. Owen
Mr. L.E. Jones, 225/1510
File (9-0020-4)

GERAGHTY & MILLER, INC.
Environmental Services

Ground Water *Engineering* *Hydrocarbon* *Remediation* *Education*

October 5, 1992
Project No. RC13602

Ms. Nancy Vukelich
Chevron U.S.A. Products Company
2410 Camino Ramon
P.O. Box 5004
San Ramon, CA 94583-0804

SUBJECT: Evaluation of Chlorinated Hydrocarbon Distribution at Former Chevron Service Station #9-0020, 1633 Harrison Street, Oakland, California.

Dear Ms. Vukelich:

Geraghty & Miller, Inc. (Geraghty & Miller) has reviewed the documents provided to us by Chevron U.S.A. Products Company (Chevron) pertaining to the presence of chlorinated hydrocarbons in the soil and ground water beneath the above-referenced former Chevron service station (Figure 1). The purpose of this review was to determine whether the data suggest that the chlorinated hydrocarbons detected in the ground water beneath the Chevron facility may emanate from a source located hydraulically upgradient (west) of the site.

Former Chevron Service Station #9-0020 is located in a mixed residential and commercial district at the intersection of 17th and Harrison Streets in Oakland, California (Figure 2). The site is presently used as a parking lot and has been used as such since site abandonment in 1972. Sixteen soil borings have been drilled on-site, eight of which have been converted to ground-water monitoring wells (MW-1 through MW-8). Six additional monitoring wells have been installed off-site (MW-9 through MW-14). Ground-water samples have been collected on a quarterly basis since November of 1988. These samples have been analyzed for petroleum and chlorinated hydrocarbons since November 1988.

EXECUTIVE SUMMARY

The data reviewed indicate that there is a source of chlorinated hydrocarbons in the ground water upgradient of the Chevron facility. This conclusion is based on four observations:

- The highest concentrations of chlorinated hydrocarbons in ground water have been detected in water samples collected from wells located along the upgradient property boundary.
- The only chlorinated hydrocarbon that has been detected in soil samples collected at the site above the ground-water table is 1,1,1-trichloroethane (TCA). One sample from Boring B-8 (MW-4) from a depth of 9.6 feet contained a TCA concentration of 0.1 mg/kg
- Chlorinated hydrocarbons, including TCA, were not detected in soil samples collected after excavation of soil in the vicinity of Boring B-8 (MW-4).
- A number of potential sources of chlorinated hydrocarbons, e.g., dry-cleaning and automotive businesses, have been identified upgradient of the site.

These observations are discussed in greater detail below.

DISCUSSION

GROUND-WATER CHEMISTRY

7-22-92 E
2-20-92 E
11-15-91 E

Depth-to-water measurements and ground-water samples have been collected and analyzed on a quarterly basis since November 1988. The direction of ground-water flow, as reported by Sierra Environmental Services (SES), has historically been towards the east (Figure 2). A summary of the historical ground-water data is presented in the SES Ground-Water Sampling Report dated July 27, 1992, a copy of which is provided in Attachment 1. not here

Tetrachloroethylene (PCE)

The highest concentrations of PCE are detected in water samples collected from Monitoring Wells MW-2, MW-3, MW-8, MW-11, and MW-14 (Figure 3). All of these wells are located either hydraulically upgradient or cross-gradient, or along the upgradient property boundary of the Chevron site. ✓ true

The highest concentrations of PCE have historically been detected in the upgradient wells located along the northwest property boundary (MW-2 and MW-3). Since November 1988, concentrations of PCE have ranged from 17 to 130 micrograms per liter (µg/L) in MW-2 and from 43 to 120 µg/L in MW-3. As discussed below, soil samples collected at the site have identified no source of chlorinated hydrocarbons, including PCE, in the soil at the

Chevron site. This indicates that PCE detected in the water samples collected from these wells is entering the Chevron site from the west.

PCE has been consistently detected in the water samples collected from Monitoring Well MW-8. The concentrations of PCE in MW-8 have reflected a steadily increasing trend, from 6 µg/L in April 1989 to 68 µg/L in February 1992. This increase may be evidence of the leading edge of the PCE-affected ground water passing beyond MW-8.) who knows

PCE has also been detected in the samples collected from Monitoring Wells MW-11, located hydraulically cross-gradient, and MW-14, located hydraulically upgradient of the Chevron site (Figure 3). Because of the hydraulic location of these wells with respect to the Chevron site, the PCE detected in the water samples from these wells probably originated from a source located to the west of the Chevron property. could be . . .

Carbon Tetrachloride

The highest concentrations of carbon tetrachloride have historically been detected in the upgradient wells located along the southwest property boundary (MW-1 and MW-4). Monitor Well MW-4, which monitors ground water entering the site from the southwest, has had the highest concentrations of carbon tetrachloride, ranging from 23 to 400 µg/L (Figure 4). Since November 1988, concentrations of carbon tetrachloride have ranged from 10 to 33 µg/L in MW-1. Carbon tetrachloride has also been detected in the samples collected from Monitoring Wells MW-2, MW-3, MW-5 through MW-8, and MW-10 through MW-12, all of which are located hydraulically downgradient. Monitor Well MW-4 has historically had concentrations of carbon tetrachloride which are 2 to 4 times higher than the wells located hydraulically downgradient of MW-4, on-site wells (MW-1, MW-2, MW-3, and MW-5 through MW-8) and 10 to 20 times higher than downgradient, off-site wells. As discussed below, soil samples collected at the site have identified no source of chlorinated hydrocarbons, including carbon tetrachloride, in the soil at the Chevron site. As with PCE discussed above, it appears that carbon tetrachloride is entering the Chevron site from the west.

is not UG. MW1 is on DG prop. boundary.

true

(of 32)

false

some

these are cross grad. not DG!

SOIL INVESTIGATIONS

On-site subsurface investigation has been performed at the site to determine if a source of chlorinated hydrocarbons existed in the soil along the northwest, hydraulically upgradient, property boundary and to install additional on-site ground-water monitoring wells to better

where's gw depth?

define the extent of affected ground water. Soil samples were collected from Borings B-4 through B-12 (Figure 5) at approximately 5-foot depth intervals and submitted to the laboratory for analysis. Chlorinated hydrocarbons were not detected in any of the soil samples collected from Soil Borings B-4 through B-7, B-9, B-10, or B-12. 1,1,1-trichloroethane (TCA) was detected in one soil sample collected from a depth of 9.6 feet from Boring B-8 (MW-4) at a concentration of 0.1 milligram per kilogram (mg/kg), but no chlorinated compounds were detected in samples collected from above or below that depth. TCA was also detected in a sample collected from Soil Boring B-11 (MW-7) at 23.5 feet (below the water table) at a concentration of 0.2 mg/kg. No chlorinated hydrocarbons were detected in soil samples collected above the water table in Soil Boring B-11. Soil Borings B-8 through B-12 were completed as Monitor Wells MW-4 through MW-8, respectively.

DTW MW4 21.33 MW7 18.99

(MW4 was later overexcavated to ND VOCs)

Off-site Soil Borings B-13 through B-16 and MW-13 and MW-14 have been drilled in the vicinity of the site (Figure 5). The total depths of these borings ranged between 26 feet and 30 feet. Soil Borings B-13 through B-16 were completed as Monitor Wells MW-11, MW-12, MW-10, and MW-9, respectively. Samples from Soil Borings B-13 through B-15 were collected on approximate 5-foot intervals, beginning at a depth of 16 feet. Samples from Boring B-16 were collected at 5-foot intervals beginning at a depth of 6 feet. Soil samples from MW-14 were collected from approximate 5-foot intervals. Soil samples collected from MW-13 were not analyzed for chlorinated hydrocarbons. Chlorinated hydrocarbons were not detected in any of the soil samples collected from Borings B-13 through B-15 or MW-14.

what also in B-16 (MW9)?

(See June 1989 "Subsurface Invest." by Western Geo. Resources Inc.)

SOIL EXCAVATION

Soil has been excavated from the area surrounding MW-4 (B-8) (Figure 6). The final dimensions of the soil excavation were approximately 20 feet by 12 feet by 14 feet deep (Figure 6). Three soil samples from the excavation were analyzed for halogenated volatile organics. Samples were collected from the south wall (Sample ES-8C), from the north wall (Sample EN-10E), and from the bottom of the excavation (Sample EB-NW). Sample EB-NW, from the bottom of the excavation, was collected at a depth of approximately 14 feet. No halogenated volatile organics were detected in any of the samples.

(See 6-2-92 report by PEG)

no 111-TCA ✓

POTENTIAL OFF-SITE SOURCES

There are numerous potential upgradient sources for the chlorinated hydrocarbons in the ground water. These include dry-cleaning establishments, auto repair facilities, and printing establishments. Chlorinated hydrocarbons are used as an industrial solvent and in the dry-cleaning business.

names + addresses? - Chevron ✓ our files

CONCLUSION

The highest concentrations of PCE and carbon tetrachloride have been detected in water samples collected from wells which monitor water entering the Chevron site from the west (hydraulically upgradient). Soil sampling performed both on-site, along the property boundary, and off-site, cross-gradient and downgradient, have not identified an on-site source of chlorinated hydrocarbons. Based on the areal distribution of PCE and carbon tetrachloride, ~~there appears to be a source of these chlorinated hydrocarbons located hydraulically upgradient (west) of the~~ Chevron site.

+ TCE + c-1,2-DCE are in MW2, 3, 8, 11, (DCE in MW12 also).

Geraghty & Miller appreciates the opportunity to be of service to Chevron. If you have any questions or need further information, please do not hesitate to call.

Chloroform doesn't follow same pattern quite as well at CCl_4 + PCE.

Sincerely,
GERAGHTY & MILLER, INC.

Kent O'Brien
Project Manager/Hydrogeologist

Gary W. Keyes, P.E.
Principal Engineer/Associate

Attachments
Figure 1 Site Location Map
Figure 2 Ground-Water Elevation Map
Figure 3 Tetrachloroethylene Concentrations in Ground Water
Figure 4 Carbon Tetrachloride Concentrations in Ground Water
Figure 5 Boring and Monitor Well Locations
Figure 6 Extent of Former Excavation

Attachment 1 Boring Log for MW-7 not here

Project No. RC13602

REFERENCES

Bay Area Air Quality Management District. September 25, 1991. Permit Handbook.

Pacific Environmental Group, Inc. January 14, 1992. Findings of Subsurface Investigation at Former Chevron USA Station 9-0020, 1633 Harrison and 17th Street, Oakland, California.

———. April 1, 1992. Results of Soil Vapor Extraction Feasibility Test on December 14, 1992, at Former Chevron Station 9-0020, 1633 Harrison Street, Oakland, California.

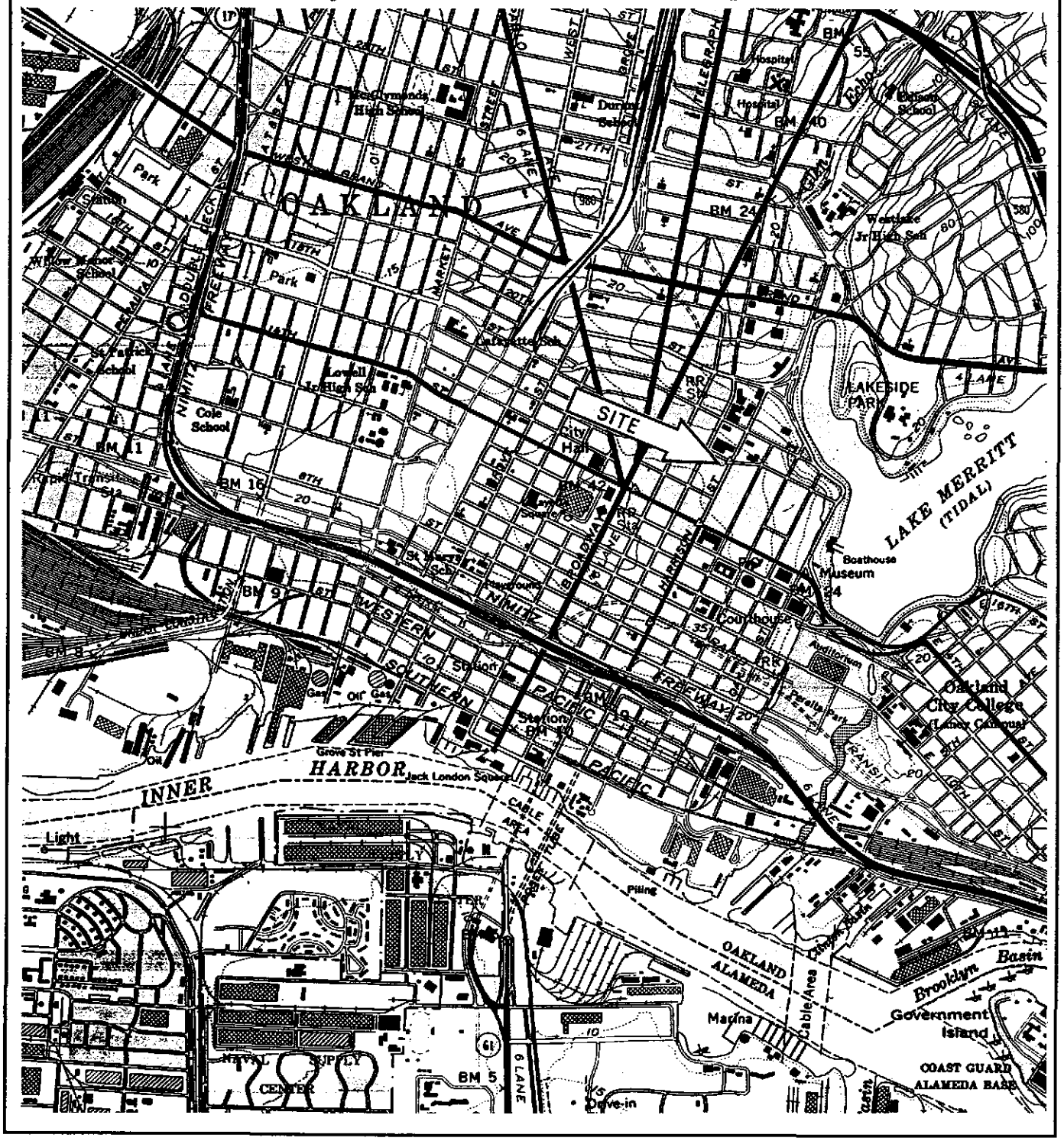
———. June 2, 1992. Results of Soil Excavation Activities Performed on January 7, 8, 9, and 22, 1992, at Former Chevron USA Service Station 9-0020, 1633 Harrison Street at 17th Street, Oakland, California.

Sierra Environmental Services. March 13, 1992. Quarterly Ground-Water Sampling, Former Chevron Service Station #9-0020, 1633 Harrison Street, Oakland, California.

Western Geologic Resources, Inc. January 24, 1989. Letter Report on Soil Sampling and Monitoring Well Installation at Chevron SS #90020, Oakland, California.

———. June 1989. Subsurface Investigation, Former Chevron Service Station #90020, 17th and Harrison, Oakland, CA.

———. July 1990. Off-Site Subsurface Investigation, Former Chevron Service Station #90020, 1633 Harrison Street, Oakland, California.



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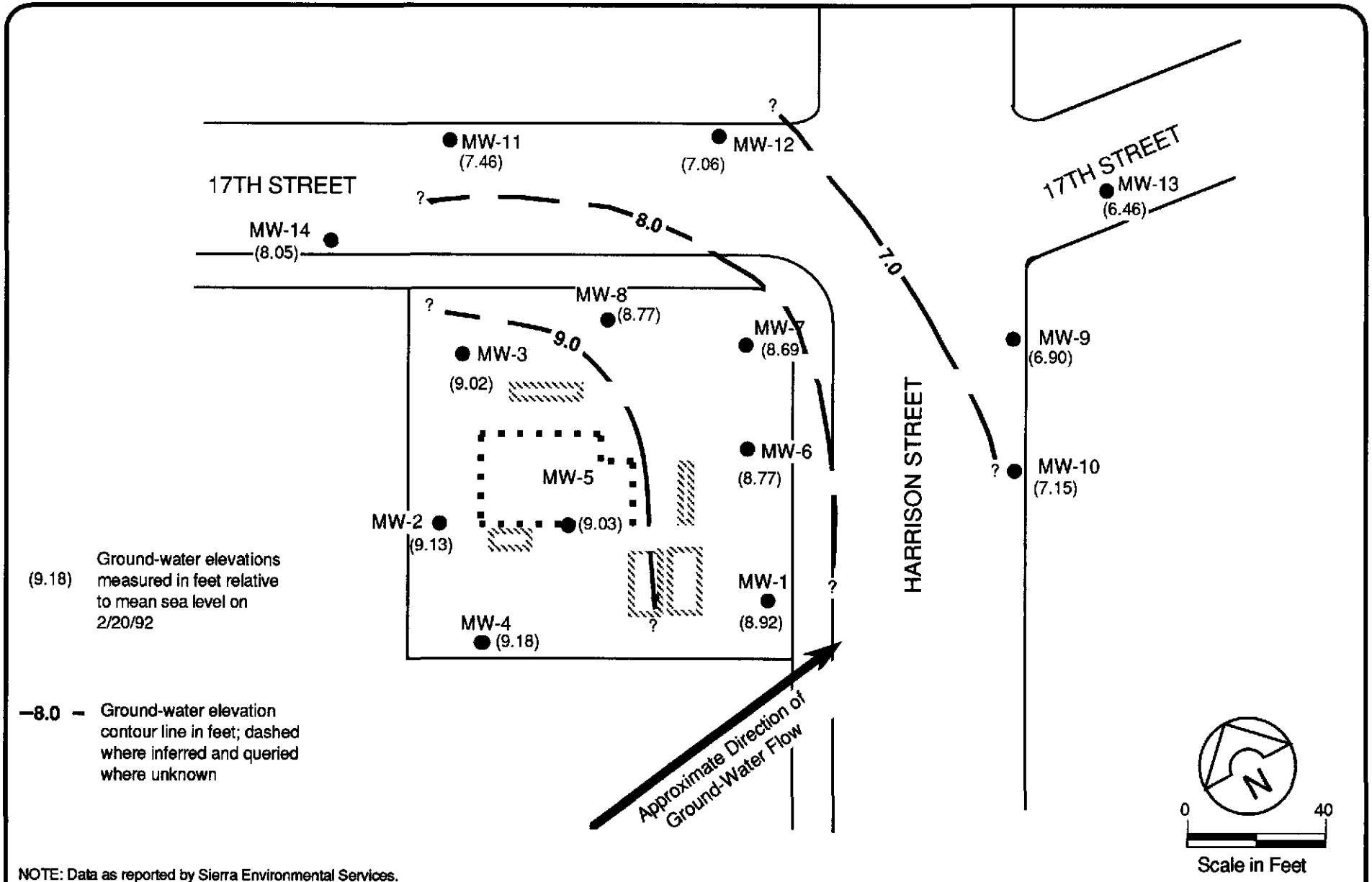
SITE LOCATION MAP
Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, California

FIGURE
1



NOTE: Data as reported by Sierra Environmental Services.

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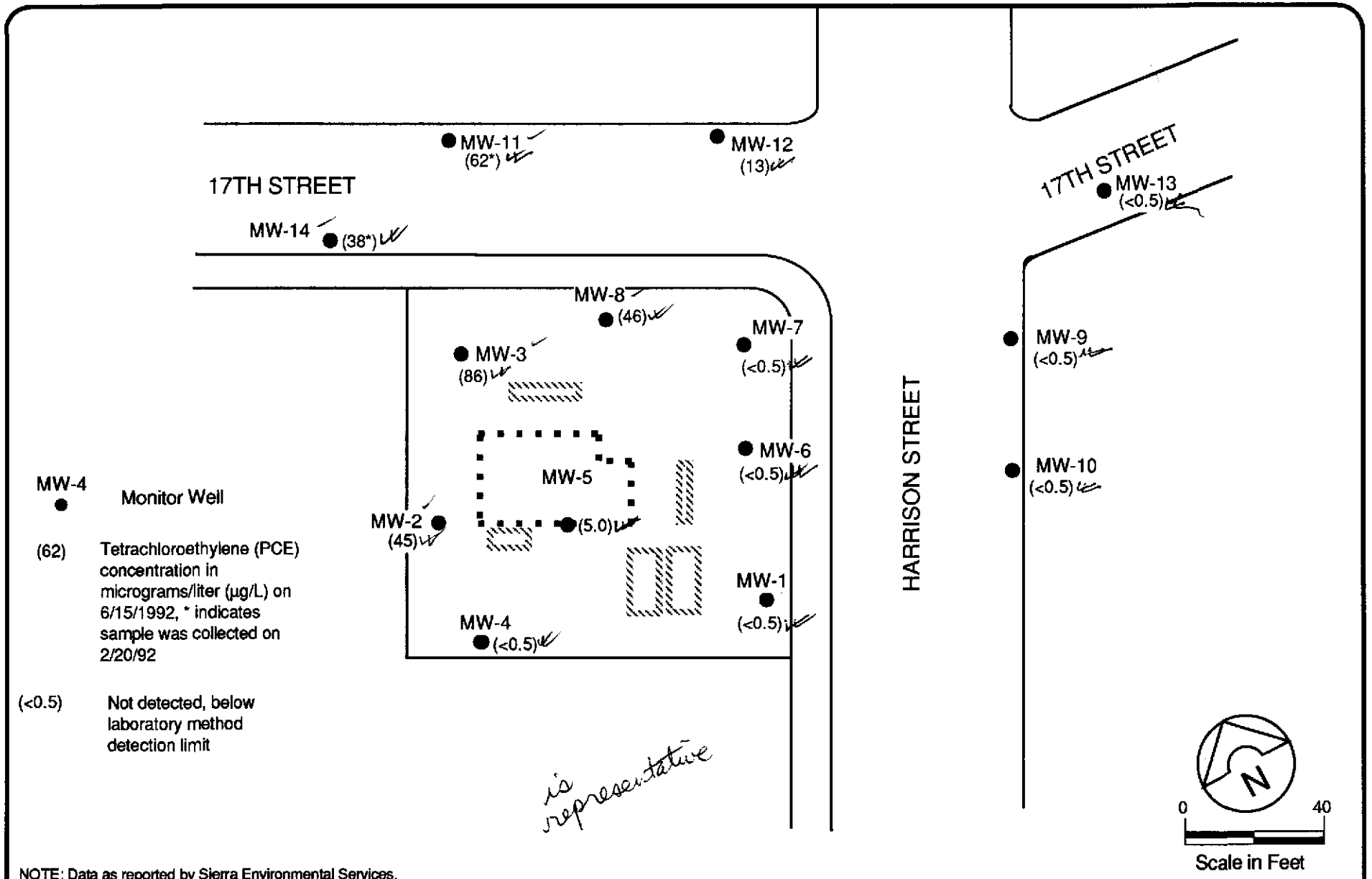
GROUND-WATER ELEVATION MAP
Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, California

FIGURE
2



NOTE: Data as reported by Sierra Environmental Services.

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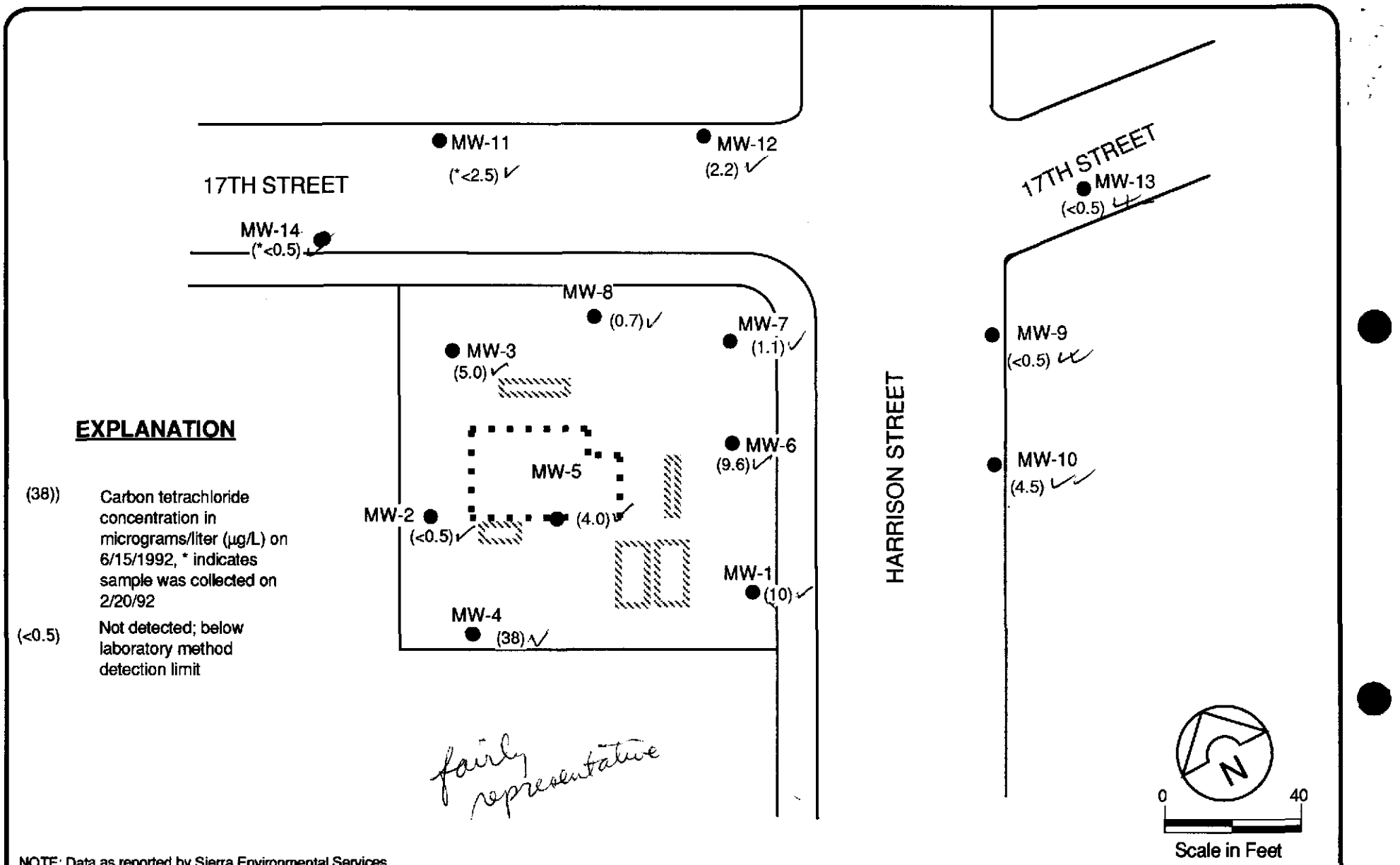
PCE

TETRACHLOROETHYLENE CONCENTRATIONS IN GROUND WATER

Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, California

FIGURE
3



NOTE: Data as reported by Sierra Environmental Services.

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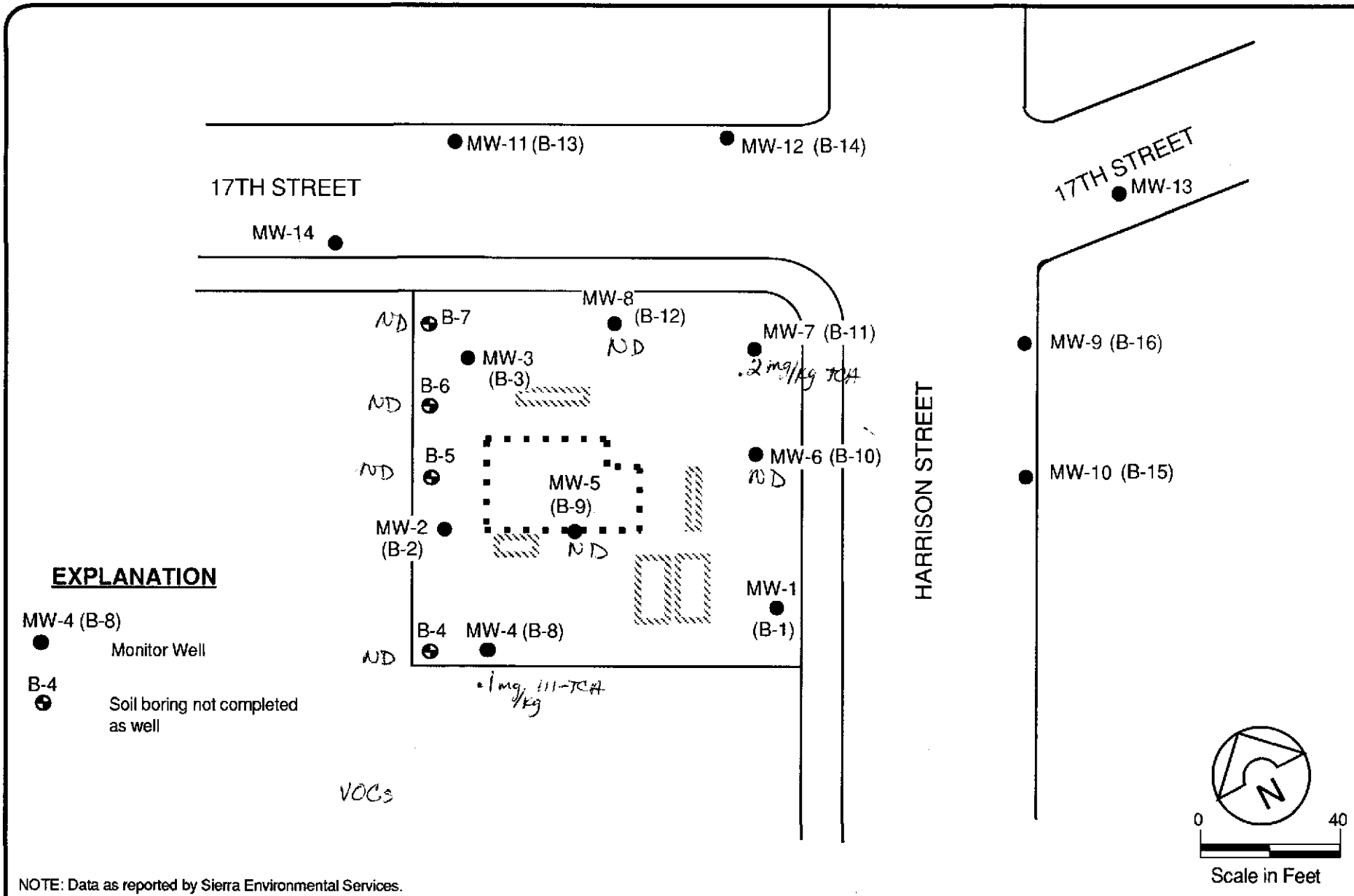
CARBON TETRACHLORIDE CONCENTRATIONS IN GROUND WATER

Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, California

FIGURE
4



NOTE: Data as reported by Sierra Environmental Services.

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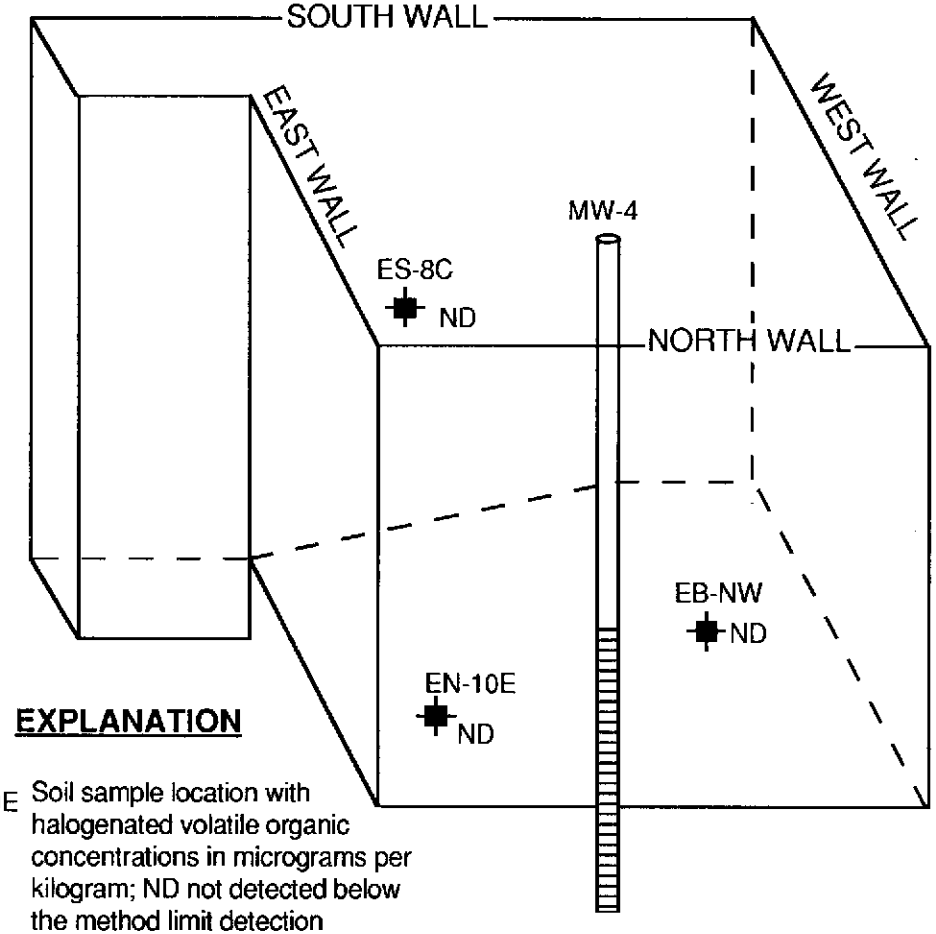
BORING AND MONITOR WELL LOCATIONS
Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, California

FIGURE
5



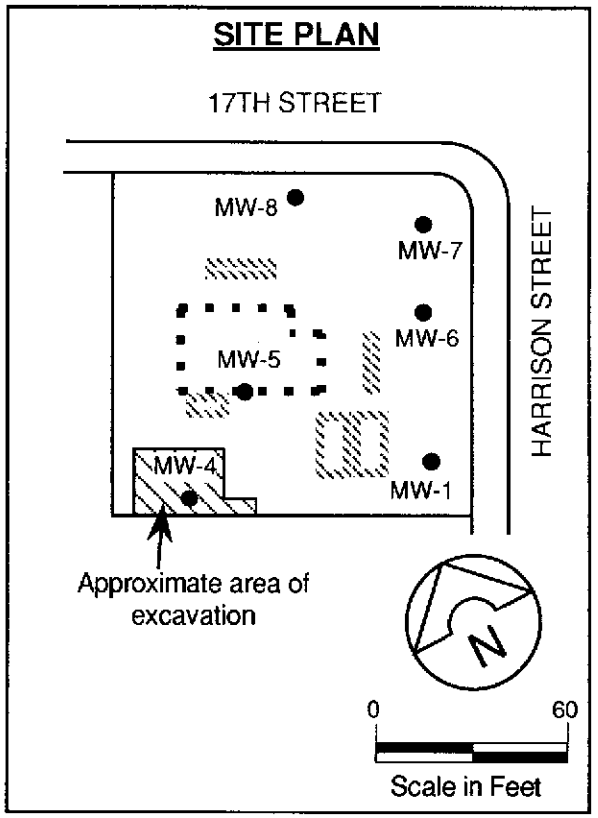
EXPLANATION

EN-10E
ND
Soil sample location with halogenated volatile organic concentrations in micrograms per kilogram; ND not detected below the method limit detection

MW-4
Monitor Well

0 10
Scale in Feet

NOTE: Data as reported by Sierra Environmental Services.



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EXTENT OF FORMER EXCAVATION by MW 4
Former Chevron Service Station #9-0020
1633 Harrison Street
Oakland, California

FIGURE
6