ALAMEDA COUNTY
**HEALTH CARE SERVICES**
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

December 26, 1996
STID 3738


Douglas and Shar Salter
Summit Realty Interests
1551 Larimer St., #1302
Denver CO 80202

RE: **FINAL REMEDIAL ACTION COMPLETION CERTIFICATION**
vacant lot, 901 Jefferson St., Oakland CA 94607

Dear Mr. and Mrs. Salter,

Thank you for submitting the "Letter Report, Abandonment of Monitoring Wells MW-5, MW-18, MW-19, and PTW-1," dated 10/31/96, prepared by Streamborn.

This letter confirms the completion of site investigation and remedial action for the four 550-gallon gasoline underground storage tanks (USTs) at the above referenced site, which were presumed to be removed from the northeast corner of the site circa 1953. Based on the available information and with the provision that the information provided to this agency was accurate and representative of site conditions, **no further action related to the underground tank release is required.**

This notice is issued pursuant to a regulation contained in Title 23, Division 3, Chapter 16, Section 2721(e) of the California Code of Regulations. A risk assessment was prepared for this site, using both residential and commercial scenarios. It was determined that the risk was within acceptable levels for this site, using either scenario, given ground floor occupancy. If there is a proposal for a change in structural configuration of the site that presents a greater potential risk (such as to include basements to be inhabited by a residential or commercial use), the owner must promptly notify this agency. Notification is not necessary should such change in structural configuration be limited to any portion of the ground level or any basement level being constructed to accommodate a parking use.

If you have any questions regarding this letter, please contact Jennifer Eberle at (510) 567-6700, ext. 6761. Attached is a copy of the Case Closure Summary, which was reviewed and approved by this agency and the Regional Water Quality Control Board (RWQCB).

Very truly yours,

Jean Makishima, for

Mee Ling Tung, Director

cc: Acting Chief, Environmental Protection Division
Kevin Graves, RWQCB
Lori Casias, SWRCB
Doug Lovell, Streamborn, PO Box 8330, Berkeley CA 94707-8330
Jennifer Eberle (3 copies)

LOP/Completion
je.3738clos.ltr

# CASE CLOSURE SUMMARY
## Leaking Underground Fuel Storage Tank Program

## I. AGENCY INFORMATION

**Date: 9/19/96**

Agency name: **Alameda County-HazMat** Address: **1131 Harbor Bay Pky**
City/State/Zip: **Alameda CA 94502** Phone: **(510) 567-6700**
Responsible staff person: **Jennifer Eberle** Title: **Hazardous Materials Spec.**

## II. CASE INFORMATION

Site facility name: vacant lot/Doug Salter
Site facility address: 901 Jefferson St., Oakland CA 94607
RB LUSTIS Case No: **N/A** Local Case No./LOP Case No.: 3738
ULR filing date: 2/1/91 SWEEPS No: **N/A**

**Responsible Parties:** **Addresses:** **Phone Numbers:**
Douglas and Shar Salter, 1551 Larimer St., #1302, Denver CO 80202

| Tank No: | Size in gal.: | Contents: | Closed in-place or removed?: | Date: |
|---|---|---|---|---|
| 1 | 550 | gasoline | presumed removed | circa 1953 |
| 2 | 550 | gasoline | presumed removed | circa 1953 |
| 3 | 550 | gasoline | presumed removed | circa 1953 |
| 4 | 550 | gasoline | presumed removed | circa 1953 |

## III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: unknown
Site characterization complete? YES
Monitoring Wells installed? YES Number: 4
Proper screened interval? YES
Highest GW depth below ground surface (DTW): 21.11'bgs (MW1 in 6/95)
Lowest GW depth: 25.02' (MW18 in 11/94 and MW19 in 12/93)
Flow direction: variable between 1989 and 1993; generally West after 1993
Most sensitive current use at present: vacant lot, possible future use as residential
Are drinking water wells affected? NO Aquifer name: NA
Is surface water affected? Probably not Nearest SW name: Oakland Inner Harbor is approximately 1 mi South
Off-site beneficial use impacts (addresses/locations): n/a
Report(s) on file? **YES** Where is report(s) filed?
**Alameda County, 1131 Harbor Bay Pky, Alameda Ca 94502**

**Leaking Underground Fuel Storage Tank Program**

**Treatment and Disposal of Affected Material:**

| Material | Amount (include units) | Action (Treatment of Disposal w/destination) | Date |
|---|---|---|---|
| Tank | four 550-gal | unknown | |
| Soil | | unknown | |
| Groundwater | | unknown | |

**Maximum Documented Contaminant Concentrations - - Before and After Cleanup**

| Contaminant | Soil (ppm) | | Water (ppb) | |
|---|---|---|---|---|
| | Before* | After** | Before# | After## |
| TPH (Gas) | 1,500 | 530 | 24,000 | 18,000 |
| Benzene | 0.68 | <0.20 | 7,500 | 320 |
| Toluene | 6.0 | 0.71 | 220 | 120 |
| Xylene | 99 | 3.3 | 730 | 530 |
| Ethylbenzene | 32 | 2.3 | 990 | 260 |

* During WCC's 8/89 investigation, boring 17 (TPHg and TEX) and MW19 (Benzene)

** The data which comes closest to "after soil results" would be from dosing well PTW-1, installed by Streamborn in 10/94 for insitu bioremediation. However, these results are not actually post-remediation soil results. No borings were installed after PTW-1, since a risk assessment was conducted. Two soil samples were taken from PTW-1, one above the gw table (24.0-24.5'bgs), and one below the gw table (25.5-26.0'bgs). Although the lower sample had the highest results, the higher sample had is more representative of soil, since it is above the gw table; these results are recorded here. Note the decrease in all constituents.

# Initial MW samples taken on 4/24/89 from the first well installed (MW5)

## Final MW samples taken 3/5/96; maximum concentration recorded (MW19)

## IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Undetermined
Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? Undetermined
Does corrective action protect public health for current land use? YES
Site management requirements: NA
Should corrective action be reviewed if land use changes? NO
Monitoring wells Decommisioned: Not yet
Number Decommisioned: 0 Number Retained: 3
List enforcement actions taken: none
List enforcement actions rescinded: none

## V. ADDITIONAL COMMENTS, DATA, ETC.

**See the large Attachment 1 for a complete chronology of activities.**

In 1989, Woodward Clyde Consultants (WCC) conducted a subsurface investigation. Five 30-foot soil borings and one monitoring well had previously been installed. This investigation consisted of the installation of 19 soil borings (including 3 monitoring wells). It was concluded that gasoline and oil were dispensed onsite, and this gas station was demolished over 30 years ago. Maximum soil concentrations included 1,500 mg/kg TPH-g (boring 17), 0.68 mg/kg benzene (MW19), 6.0 mg/kg toluene (boring 17), 32 mg/kg ethylbenzene (boring 17), and 99 mg/kg xylenes (boring 17); **See Table 1a**. Maximum groundwater concentrations included 26,000 ug/L TPHg (MW19) and 7,500 ug/L benzene (MW5); **See Table 1b.** WCC concluded that the TPH-g lies in a layer of soil approximately 25'bgs, approximately 4' thick, and covering approximately 3000 square feet. The concentrations are mapped out in **Figure 1. See also the large Attachment 2 for a summary of soil analytical results.**

WCC performed additional work in April 1990. Ten soil borings were drilled in 10th St. and Jefferson St; **See Figure 2**. Groundwater was found to occur at a depth of 26'bgs, immediately below the zone of maximum soil contamination. **See Figure 3,** compiled by Streamborn, for boring/MW locations and soil results. Since no USTs were encountered by the 29 soil borings drilled, it appeared that the USTs for the prior service station were previously removed during station demolition in 1953.

Groundwater has been periodically sampled from 4/24/89 to 3/5/96. An unknown amount of free product was first found in MW19 on 3/2/93, possibly due to the rise in groundwater elevation (GWE).

Groundwater flow has ranged from Southeast to Southwest to Northwest between 8/89 and 3/93; **see Table 2, and the large attachment 3 for a complete history of GWEs.** Groundwater flowed East-Southeast on 12/15/93 (when product was present). The wells were resurveyed on 12/23/94 by Streamborn. Since then, groundwater flow direction was Northwest; **see Figure 4**.

Streamborn was retained by Mr. Doug Salter in mid 1993. Approximately 1/3" of free product was again detected in MW19 during groundwater sampling in 12/93. In April 1994, Streamborn conducted a bench-scale treatability test to assess the feasibility of insitu bioremediation. In October 1994, well PTW-1 was installed inbetween MW19 and MW5 for insitu bioremediation; **see Figure 5**. Insitu bioremediation was performed between October 1994 through August 1995. Well PTW-1 was dosed with a nutrient mixture and onsite groundwater or distilled water; 38 dosing events were conducted. Between 12/94 and 3/96, groundwater was periodically analyzed for ammonia, nitrate, phosphate, and bacterial populations, in order to assess the progress of the insitu bioremediation.

The insitu bioremediation was stopped in late 1995. Groundwater concentrations were reduced in MW5, MW19, and the dosing well PTW1; **see Attachment 4, and Figures 6 and 7**. A new approach was considered. Streamborn prepared a risk assessment for benzene, evaluating the groundwater volatilization to indoor air pathway. After much consideration, a residential scenario was used, in order to be able to write a closure letter without conditions on the type of occupancy. The risk assessment was reviewed by both J. Eberle and M. Logan of Alameda County. The calculations were revised to reflect 1) the California cancer slope of 0.1 (instead of 0.029), and 2) the 95% upper confidence limit of the average benzene concentration. The revised risk assessment indicated that the risk for a residential scenario was $3.4 \times 10^{-6}$, which is acceptable.

To summarize, the reasons that this case should be closed are as follows:

* The sources appear to have been removed (four 550-gallon gasoline USTs)

* The site has been adequately characterized;

* After a benchscale test was conducted, insitu bioremediation was conducted at this site for approximately one year. Groundwater concentrations were reduced in MW5, MW19, and the dosing well PTW1;

* There is no significant risk to human health, based on a residential receptor scenario used in the ASTM Tier II Risk Assessment prepared by Streamborn; and

* There are no sensitive human or environmental receptors in the site vicinity: the nearest surface water is the Oakland Inner Harbor, which lies approximately 1 mile from the site (a significant and unlikely distance for a hydrocarbon plume to travel); **See Figure 8.**

## VI. LOCAL AGENCY REPRESENTATIVE DATA

Name: Jennifer Eberle
Signature: J Eberle
Title: Hazardous Materials Specialist
Date: 10-1-96

**Reviewed by**
Name: Madhulla Logan
Signature: Madhulla Logan
Title: Hazardous Materials Specialist
Date: 10-1-96

Name: Tom Peacock
Signature: Tom Peacock
Title: Manager of LOP
Date: 10-3-96

## VII. RWQCB NOTIFICATION

Date Submitted to RWQCB: 10-4-96
RWQCB Response: Approved
RWQCB Staff Name: Kevin Graves
Title: Associate Water Resources Control Engineer
Date: 10-17-96
K Graves

HYDROCARBON INVESTIGATION
9TH & JEFFERSON STREETS

Table 1a. ANALYTICAL RESULTS FOR SOIL[1]

| Boring | Sample # | Date | TPH[2] | Benzene | Toluene | Ethyl Benzene | Xylenes | Total Lead | Volatile Organics |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1-1, 1-2, 1-3, 1-4 | 4-19-89 | ND | ND | ND | ND | ND | 3.1 | ND |
| 2 | 2-1, 2-2, 2-3, 2-4 | 4-19-89 | ND | ND | ND | ND | ND | 2.6 | ND |
| 3 | 3-1, 3-2, 3-3, 3-4 | 4-19-89 | ND | ND | ND | ND | ND | 2.9 | ND |
| 4 | 4-1, 4-2, 4-3, 4-4 | 4-19-89 | 220 | <0.25 | <0.5 | <0.5 | <0.5 | 2.5 | ND |
| 5 | 5-1, 5-2, 5-3, 5-4 | 4-19-89 | ND | ND | ND | ND | ND | 2.2 | ND |
| 6 | 6-1, 6-2, 6-3 | 4-19-89 | ND | ND | ND | ND | ND | 2.7 | ND |
| 8 | 8-3 | 8-4-89 | 370 | ND | 1.1 | 6.5 | 12 | | |
| 10 | 10-2 | 8-4-89 | 150 | ND | 0.20 | 1.9 | 6.4 | | |
| | 10-3 | 8-4-89 | 150 | ND | 0.40 | 2.8 | 5.4 | | |
| 12 | 12-3 | 8-4-89 | 3.0 | 0.32 | ND | ND | ND | | |
| 14 | 14-1 | 8-4-89 | ND | ND | ND | ND | ND | | |
| | 14-2 | 8-4-89 | 1400 | ND | 5.0 | 37 | 64 | | |
| 15 | 15-2 | 8-7-89 | 2.0 | ND | ND | ND | ND | | |
| 17 | 17-1 | 8-4-89 | ND | ND | ND | ND | ND | | |
| | 17-2 | 8-4-89 | 1500 | ND | 6.0 | 32 | 99 | | |
| MW19 | MW19-1 | 8-7-89 | 4.4 | 0.68 | ND | 0.36 | 0.53 | | |
| Detection Limits | | 1.0 | 0.05 | 0.1 | 0.1 | 0.1 | | | |

[1] All results reported as parts per million (ppm)
[2] Low/medium boiling point hydrocarbons - Total Petroleum Hydrocarbons (TPH)

HYDROCARBON INVESTIGATION
9TH & JEFFERSON STREETS

Table 1b. ANALYTICAL RESULTS FOR WATER[1]

| Well | Date | TPH[2] | Benzene | Toluene | Ethyl Benzene | Xylene | Volatile Organics[3] |
|---|---|---|---|---|---|---|---|
| MW-5 | 4-24-89 | 24.0 | 7.5 | 0.22 | 0.99 | 0.73 | acetone-2.1 |
| MW-5 | 8-14-89 | 19.0 | 5.4 | 0.21 | 0.77 | 0.44 | ND |
| MW-18 | 8-14-89 | 7.6 | 0.16 | 0.021 | 0.21 | 0.014 | |
| MW-19 | 8-14-89 | 26.0 | 4.3 | 0.69 | 0.98 | 2.6 | |
| Detection Limits | 0.030 | 0.0003 | 0.0003 | 0.0003 | 0.0003 | | |

1 All results reported as parts per million (ppm)
2 Low/medium boiling point hydrocarbons - Total Petroleum Hydrocarbons (TPH)
3 Other than benzene, toluene, ethyl benzene, and xylene

Table 2

## ~~ATTACHMENT 2~~: GROUNDWATER ELEVATIONS AND GRADIENTS

| Date | Depth to Water (ft) | | | Relative Groundwater Elevations* (ft) | | | Groundwater Gradient (ft/ft) and Direction |
|---|---|---|---|---|---|---|---|
| | MW-5 | MW-18 | MW-19 | MW-5 | MW-18 | MW-19 | |
| 8/14/89 | 24.95 | 25.26 | 25.23 | -25.42 | -25.53 | -25.23 | 0.0056, N84°W |
| 2/15/91 | 25.95 | 26.30 | 26.40 | -26.42 | -26.57 | -26.40 | 0.0018, S9°W |
| 3/27/91 | 25.29 | 25.66 | 25.55 | -25.76 | -25.93 | -25.55 | 0.0062, N90°W |
| 3/2/93 | 22.93 | 23.41 | 23.50 | -23.40 | -23.68 | -23.50 | 0.0059, S38°E |

* Groundwater elevations are calculated using the TOC of well MW-19 as a datum at 0.0 ft; well MW-5 TOC was measured at an elevation of -0.47 ft and well MW-18 TOC was measured at an elevation of -0.27 ft from this datum by WCC.

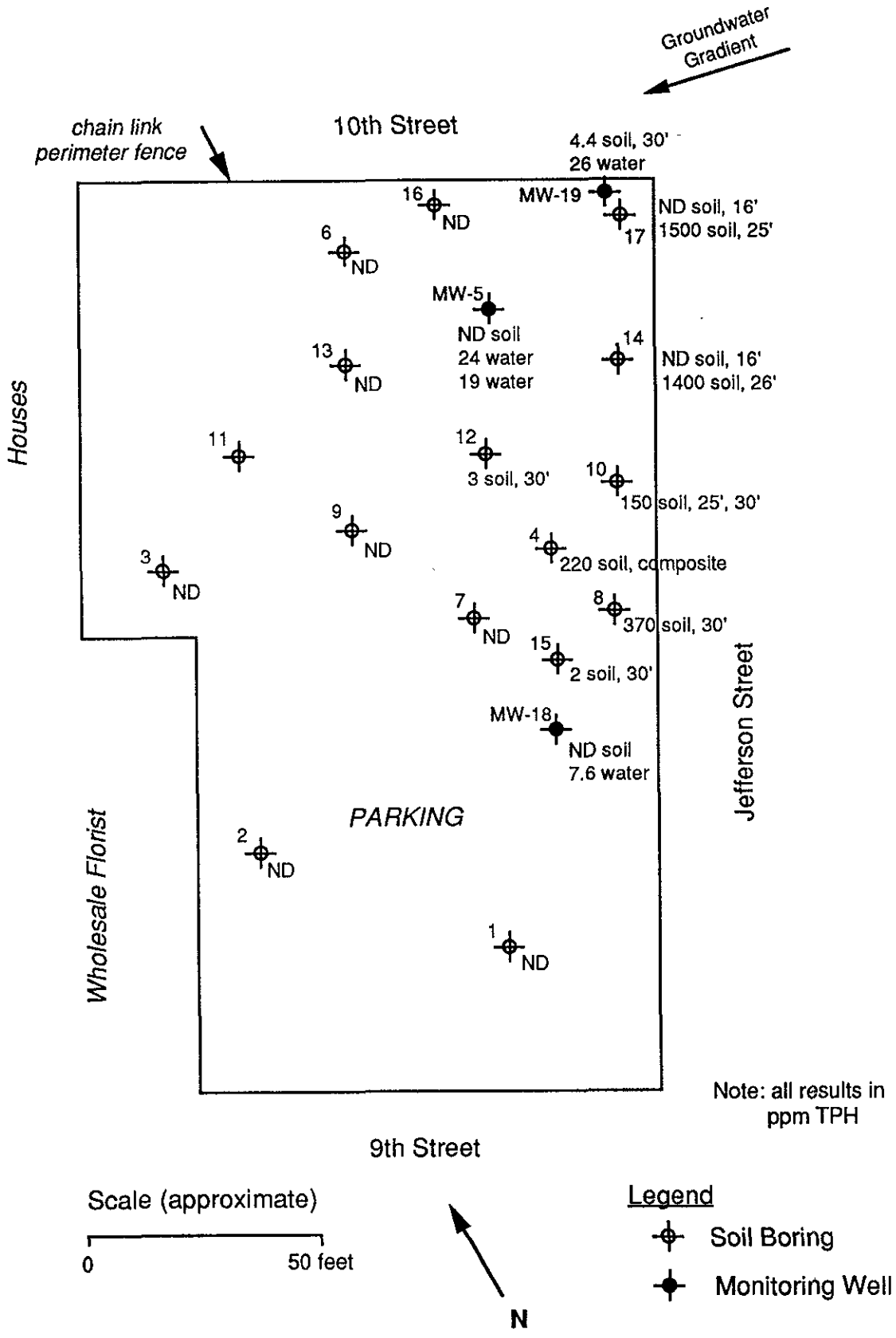
Table 3

~~ATTACHMENT 3~~

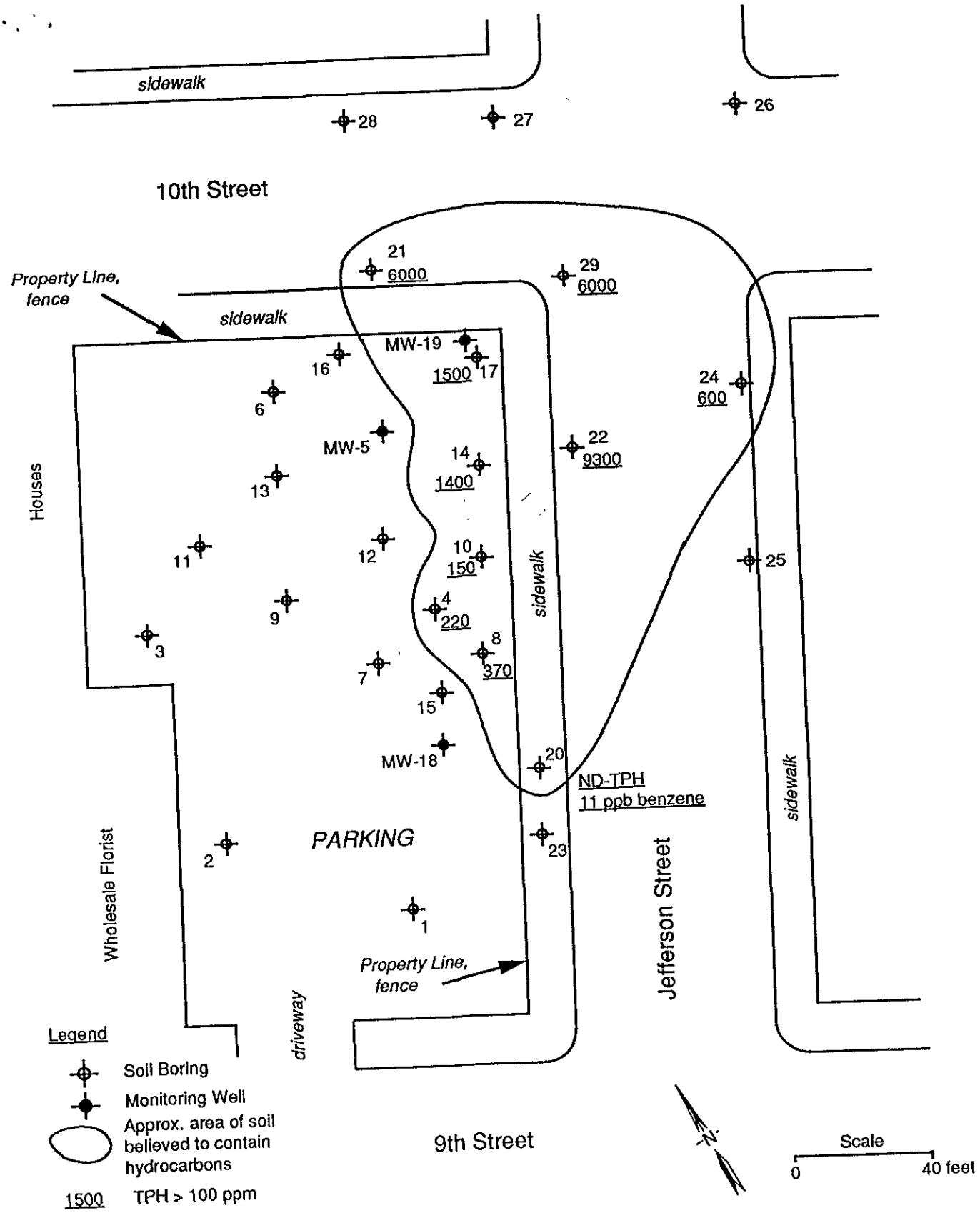
## TPH AND BTEX CONCENTRATIONS IN GROUNDWATER

| Date | Monitoring Well MW-5 | MW-18 | MW-19 |
|---|---|---|---|
| TPH (mg/L) - gas | ppb | ppb | ppb |
| 04/24/89 | 24 | -- | -- |
| 08/14/89 | 19 | 7.6 | 26 |
| 02/15/91 | 13 | 2.7 | 13 |
| 03/02/93 ✓ | 32 32,000 ✓ | 3.2 3,200 ✓ | 46 46,000 ✓ |
| **BENZENE (µg/L)** | | | |
| 04/24/89 | 7,500 | -- | -- |
| 08/14/89 | 5,400 | 160 | 4,300 |
| 02/15/91 | 7,500 | 56 | 1,800 |
| 03/02/93 | 4,400 ✓ | 11 ✓ | 10,000 ✓ |
| **TOLUENE (µg/L)** | | | |
| 04/24/89 | 220 | -- | -- |
| 08/14/89 | 210 | 21 | 690 |
| 02/15/91 | 250 | 22 | 640 |
| 03/02/93 | 170 | 26 | 1,100 |
| **ETHYL BENZENE (µg/L)** | | | |
| 04/24/89 | 990 | -- | -- |
| 08/14/89 | 770 | 210 | 980 |
| 02/15/91 | 1,000 | 94 | 510 |
| 03/02/93 | 620 | 17 | 1,700 |
| **XYLENES (µg/L)** | | | |
| 04/24/89 | 730 | -- | -- |
| 08/14/89 | 440 | 14 | 2,600 |
| 02/15/91 | 340 | 20 | 2,600 |
| 03/02/93 | 260 | 19 | 4,500 |

-- = well not installed at time of sampling

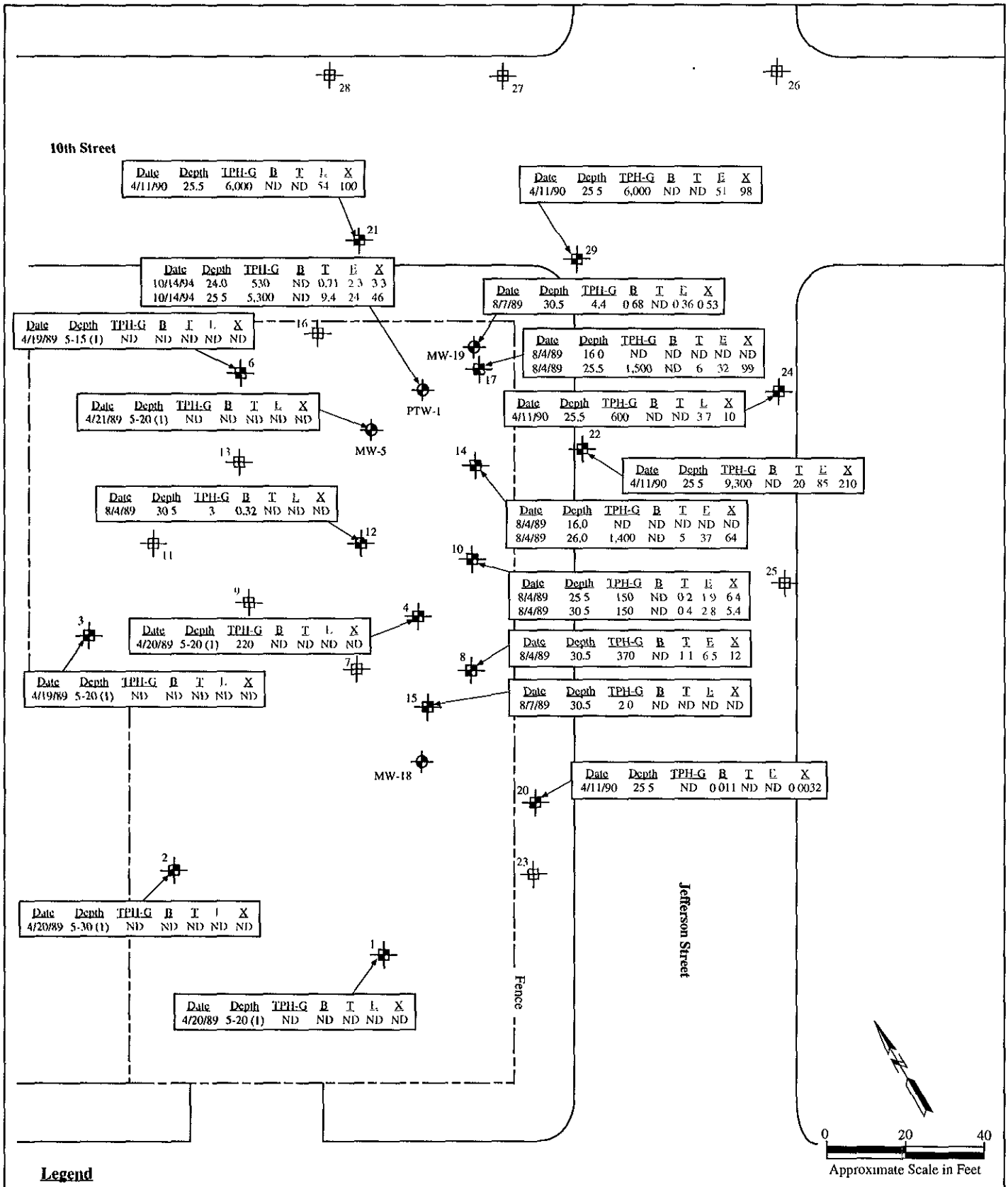



| Project No. 8910084A | 9th and Jefferson EA | 9th and Jefferson Site Map | Figure 1 |
|---|---|---|---|
| **Woodward-Clyde Consultants** | | | |




| | | | |
|---|---|---|---|
| Project No. 8910084A | 9th and Jefferson EA | 9th and Jefferson Site Map | ~~Attachment~~ |
| **Woodward-Clyde Consultants** | | | |

Fig. 2




| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/11/90 | 25.5 | 6,000 | ND | ND | 54 | 100 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/11/90 | 25 5 | 6,000 | ND | ND | 51 | 98 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 10/14/94 | 24.0 | 530 | ND | 0.71 | 2 3 | 3 3 |
| 10/14/94 | 25 5 | 5,300 | ND | 9.4 | 24 | 46 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 8/7/89 | 30.5 | 4.4 | 0 68 | ND | 0 36 | 0 53 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/19/89 | 5-15 (1) | ND | ND | ND | ND | ND |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 8/4/89 | 16 0 | ND | ND | ND | ND | ND |
| 8/4/89 | 25.5 | 1,500 | ND | 6 | 32 | 99 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/21/89 | 5-20 (1) | ND | ND | ND | ND | ND |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/11/90 | 25.5 | 600 | ND | ND | 3 7 | 10 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/11/90 | 25 5 | 9,300 | ND | 20 | 85 | 210 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 8/4/89 | 30 5 | 3 | 0.32 | ND | ND | ND |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 8/4/89 | 16.0 | ND | ND | ND | ND | ND |
| 8/4/89 | 26.0 | 1,400 | ND | 5 | 37 | 64 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 8/4/89 | 25 5 | 150 | ND | 0 2 | 1 9 | 6 4 |
| 8/4/89 | 30 5 | 150 | ND | 0 4 | 2 8 | 5.4 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/20/89 | 5-20 (1) | 220 | ND | ND | ND | ND |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 8/4/89 | 30.5 | 370 | ND | 1 1 | 6 5 | 12 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/19/89 | 5-20 (1) | ND | ND | ND | ND | ND |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 8/7/89 | 30.5 | 2 0 | ND | ND | ND | ND |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/11/90 | 25 5 | ND | 0 011 | ND | ND | 0 0032 |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/20/89 | 5-30 (1) | ND | ND | ND | ND | ND |

| Date | Depth | TPH-G | B | T | E | X |
|---|---|---|---|---|---|---|
| 4/20/89 | 5-20 (1) | ND | ND | ND | ND | ND |

**Legend**

- Soil Boring (samples analyzed by laboratory) — 29
- Soil Boring (not contaminated based on field screening) — 9
- Monitoring Well — MW-18

TPH-G = total petroleum hydrocarbons as gasoline

B = benzene
T = toluene
E = ethylbenzene
X = xylenes
ND = not detected

Analytical results reported in mg/kg.

Footnote (1) Composite sample from indicated depth interval.

**Figure 3**

**Analytical Results for Soil Borings**

**901 Jefferson Street Oakland CA**

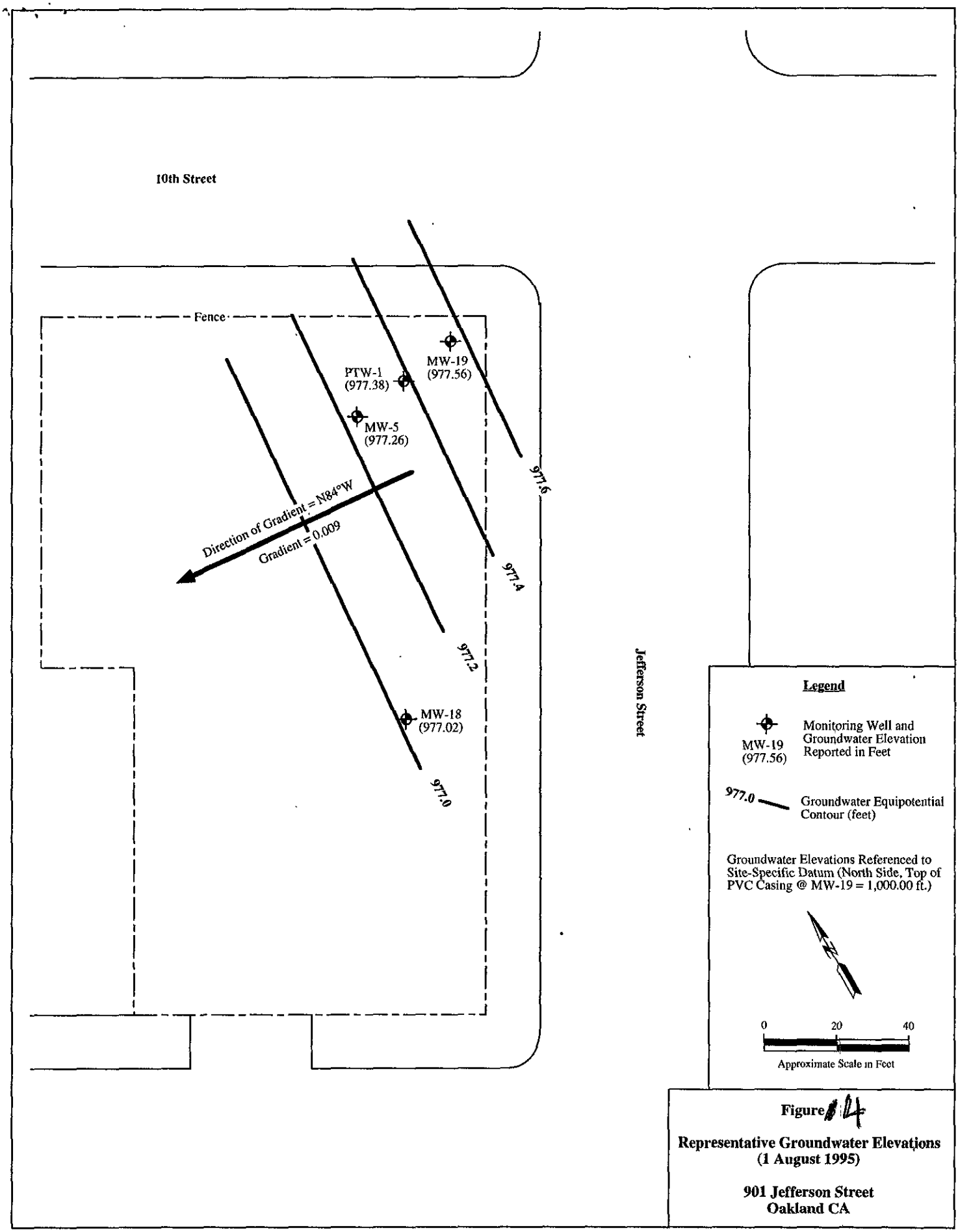



**Figure 4**

**Representative Groundwater Elevations (1 August 1995)**

**901 Jefferson Street**
**Oakland CA**

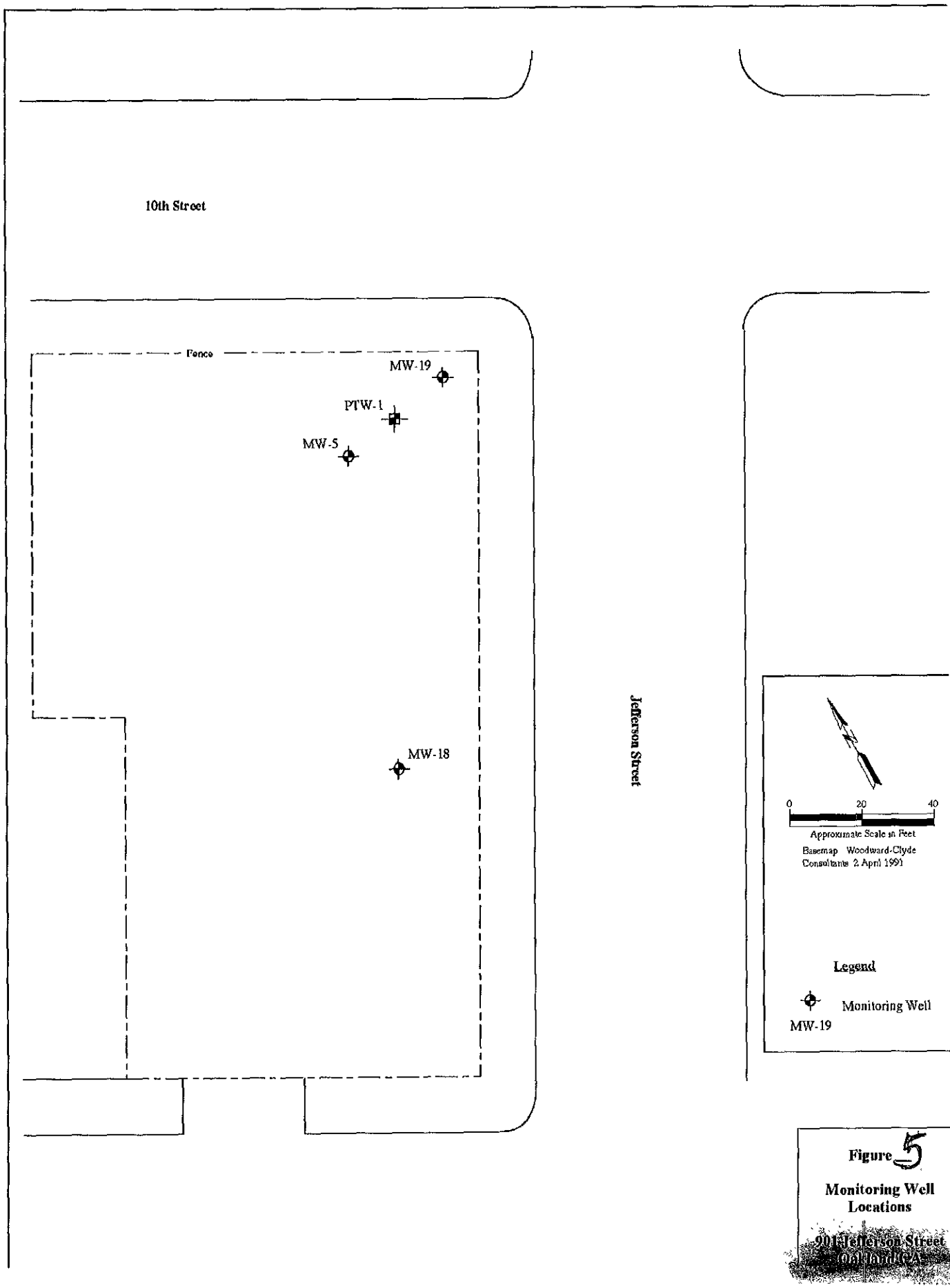
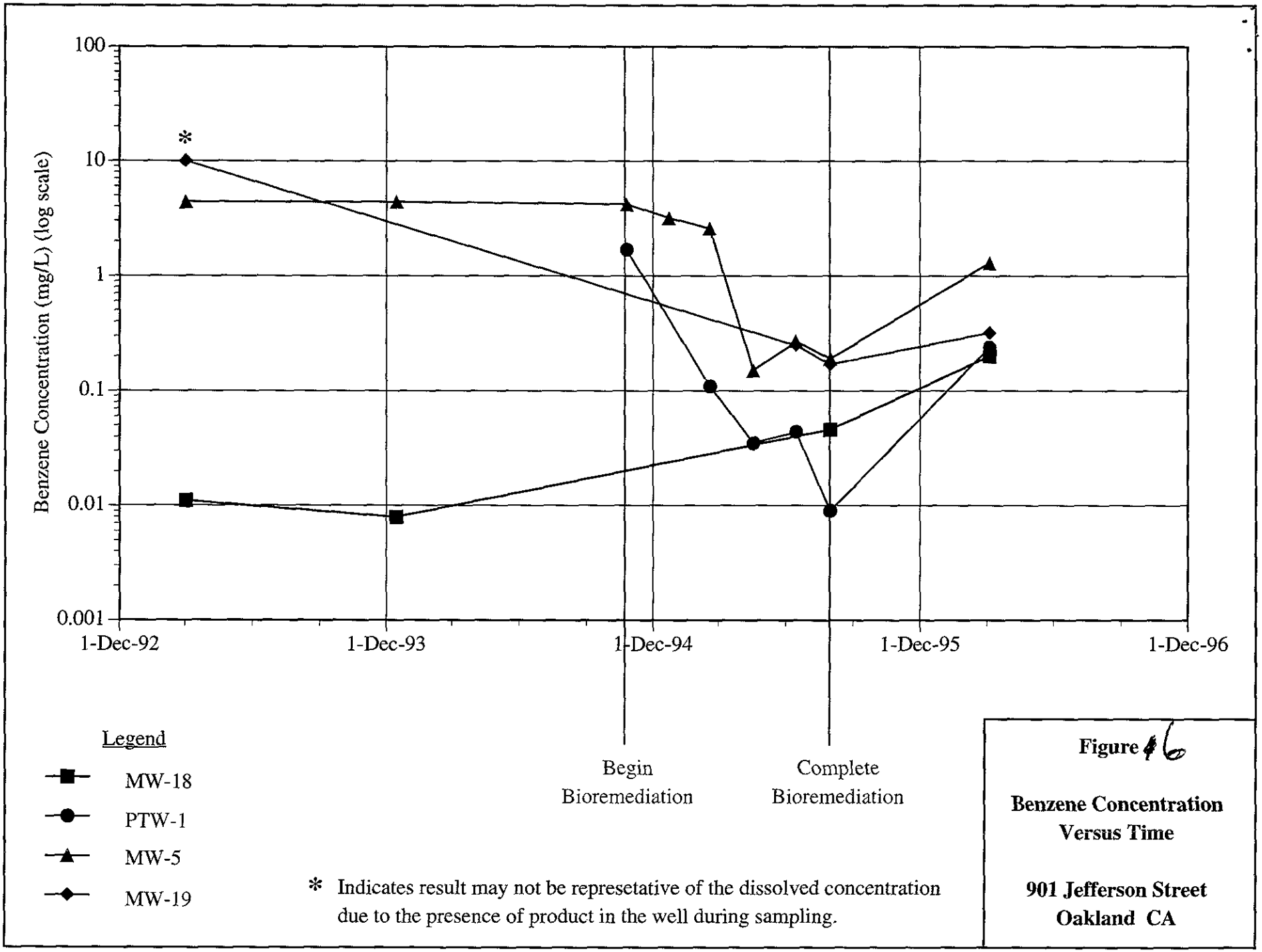



**Figure 5**

**Monitoring Well Locations**

**901 Jefferson Street**
**Oakland, CA**

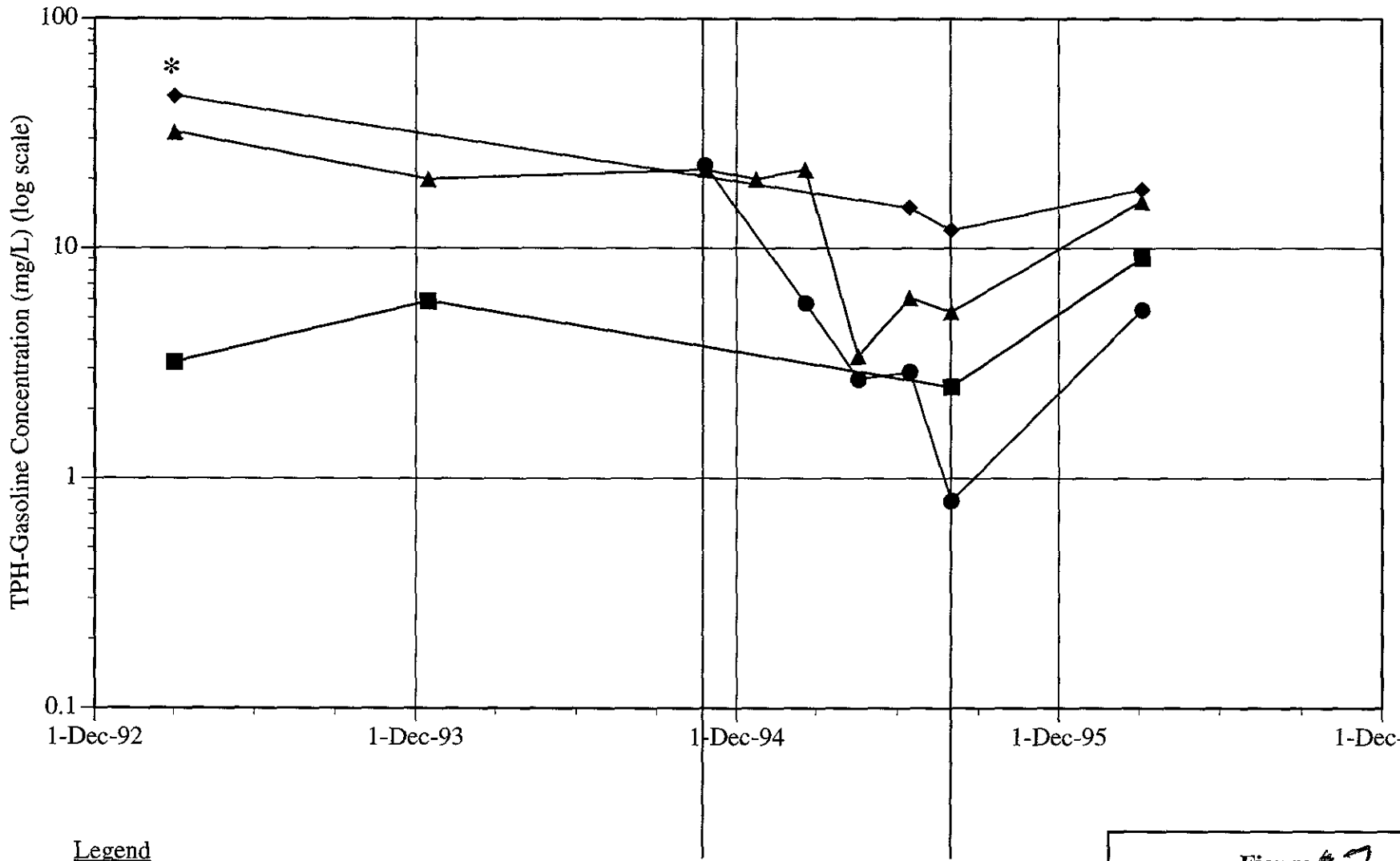



* Indicates result may not be represetative of the dissolved concentration due to the presence of product in the well during sampling.

**Figure 6**

**Benzene Concentration Versus Time**

**901 Jefferson Street Oakland CA**

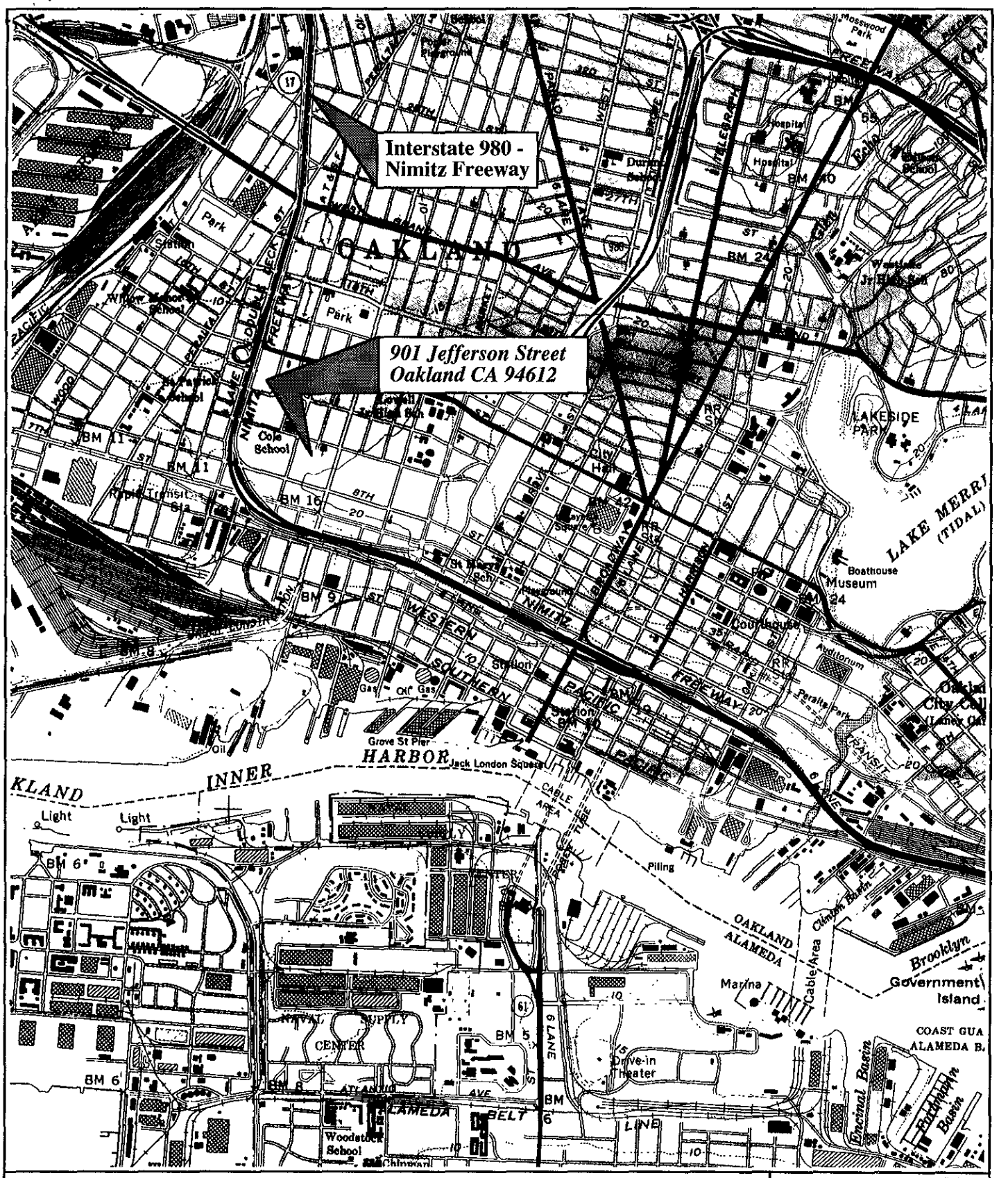



* Indicates result may not be represetative of the dissolved concentration due to the presence of product in the well during sampling.

**Figure 7**

**TPH-Gasoline Concentration Versus Time**

**901 Jefferson Street Oakland CA**




Basemap: U.S. Geological Survey, 7.5 Minute Quadrangle, Oakland West CA, 1959 (Photorevised 1980)

**Figure 8**

**Location Map**

**901 Jefferson Street**
**Oakland CA**

Attachment 1

[redacted]

**Chronology of Environmental Activities**

**901 Jefferson Street**
**Oakland CA**

| Date of Activity | Activity Performed By | Description |
|---|---|---|
| Unknown | Unknown | • Four 550-gallon underground tanks installed at property. |
| 1946 to 1953 | Unknown | • An automotive service station was operated at the property. Four 550-gallon underground fuel tanks were used to store gasoline. |
| Circa 1953 | Unknown | • Automotive service station demolished and the property paved. Records were not discovered to determine if the tanks were removed or abandoned in place. The property was subsequently used as a parking lot. |
| Circa 1978 | Douglas Salter | • Douglas N. Salter purchased the property. The property continued to be used as a parking lot. |
| 19 and 20 April 1989 | WCC | • 6 borings drilled (Borings 1 through 6).<br>• Soil samples analyzed for TPH-Gasoline, BTEX, and lead. |
| 21 April 1989 | WCC | • Boring 5 completed as groundwater monitoring well (MW-5). |
| 24 April 1989 | WCC | • Groundwater level measured and groundwater sample collected at MW-5<br>• Groundwater sample analyzed for TPH-Gasoline and BTEX. |
| 4 and 7 August 1989 | WCC | • 10 borings drilled (Borings 7 through 10, and 12 through 17).<br>• Samples exhibiting gasoline odor were analyzed for TPH-Gasoline and BTEX<br>• Borings 18 and 19 completed as groundwater monitoring wells (MW-18 and MW-19). |
| 14 August 1989 | WCC | • Groundwater levels measured and groundwater samples collected at MW-5, MW-18, and MW-19. Groundwater samples analyzed for TPH-Gasoline and BTEX. Samples collected from MW-5 were also analyzed for volatile organic compounds by EPA Method 8240. |
| 10 and 11 April 1990 | WCC | • 10 borings drilled (Borings 20 through 29).<br>• Samples exhibiting gasoline odor were analyzed for TPH-Gasoline and BTEX. |
| 15 February 1991 | WCC | • Groundwater levels measured and groundwater samples collected at MW-5, MW-18, and MW-19. Groundwater samples analyzed for TPH-Gasoline and BTEX. |
| 20 February 1991 | WCC | • Vapor extraction pilot test performed.<br>• Analytical results from soil vapor samples revealed detectable levels of BTEX and elevated concentrations of total volatile organic vapors. |
| 2 March 1993 | WCC | • Groundwater levels measured and groundwater samples collected at MW-5, MW-18, and MW-19. Groundwater samples analyzed for TPH-Gasoline and BTEX<br>• Floating product observed in MW-19. |
| 15 December 1993 | Streamborn | • Groundwater levels measured and groundwater samples collected at MW-5 and MW-18 Groundwater sample collected at well MW-19 for use in bench-scale treatability study of insitu bioremediation. Groundwater samples analyzed for TPH-Gasoline and BTEX<br>• Floating product observed in well MW-19. |
| 15 April 1994 | Streamborn | • Bench-scale treatability testing completed. Bench-scale treatability testing was performed to assess the feasibility of insitu bioremediation. Results confirmed the feasibility of insitu bioremediation. |
| 14 October 1994 | Streamborn | • Well PTW-1 installed (to be used for insitu bioremediation). |
| 26 October 1994 | Streamborn | • Groundwater levels measured and groundwater samples collected at MW-5 and PTW-1. Groundwater samples analyzed for TPH-Gasoline and BTEX. |
| 26 October 1994 through 1 August 1995 | Streamborn | • Insitu bioremediation performed. Activities included dosing of well PTW-1 with solution consisting of onsite groundwater or distilled water, hydrogen peroxide, ammonium chloride, calcium nitrate, and potassium phosphate. 38 dosing events conducted. Between 10 and 40 gallons of dosing solution were added to PTW-1 during each event. |
| 23 December 1994 | Streamborn | • Groundwater sample collected at MW-5 and analyzed for TPH-Gasoline and BTEX Field analyses performed for ammonia, nitrate, and phosphate.<br>• Groundwater sample collected from PTW-1. Field analyses performed for ammonia, nitrate, and phosphate.<br>• Well casing elevations surveyed and groundwater levels measured for MW-5, MW-18, PTW-1, and MW-19. |
| 17 February 1995 | Streamborn | • Groundwater levels measured and groundwater samples collected at MW-5 and PTW-1. Groundwater samples analyzed for TPH-Gasoline and BTEX. |
| 18 April 1995 | Streamborn | • Groundwater levels measured and groundwater samples collected at MW-5 and PTW-1. Groundwater samples analyzed for TPH-Gasoline, BTEX, ammonia, nitrate, phosphate, and bacteria populations. Field analyses performed for ammonia, nitrate, and phosphate. |
| 15 June 1995 | Streamborn | • Groundwater levels measured and groundwater samples collected at MW-5, PTW-1, and MW-19. Groundwater samples analyzed for TPH-Gasoline and BTEX. |
| 1 August 1995 | Streamborn | • Groundwater levels measured and groundwater samples collected at wells MW-18, MW-5, PTW-1, and MW-19. Groundwater samples analyzed for TPH-Gasoline, BTEX, ammonia, nitrate, phosphate, and bacteria populations. |
| 5 March 1996 | Streamborn | • Groundwater levels measured and groundwater samples collected at wells MW-18, MW-5, PTW-1, and MW-19. Groundwater samples analyzed for TPH-Gasoline, BTEX, ammonia, nitrate, and phosphate.<br>• Purge water from sampling was reused to formulate dosing solution then added to well PTW-1. |

General Notes

(a) WCC = Woodward-Clyde Consultants, Oakland CA.

(b) BTEX = benzene, toluene, ethylbenzene, and xylenes.

(c) TPH-Gasoline = total petroleum hydrocarbons as gasoline.

[redacted]

Soil Analytical Results

901 Jefferson Street
Oakland CA

| Location | Depth (feet) | Date | Sample Identification | Collected By | Laboratory Analyses By | Sample Type | Field Screening Observations | TPH-Gasoline (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Xylenes (mg/kg) | Total Lead (mg/kg) | Other Volatile Organic Compounds (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boring 1 | 5, 10, 15, 20 | 20 April 1989 | 1-1, 1-2, 1-3, 1-4 | WCC | Sequoia | Composite | <5 ppm (HNU) | <1.0 | <0.05 | <0.1 | <0.1 | <0.1 | 3.1 | ND |
| Boring 2 | 5, 10, 15, 30 | 20 April 1989 | 2-1, 2-2, 2-3, 2-4 | WCC | Sequoia | Composite | <5 ppm (HNU) | <1.0 | <0.05 | <0.1 | <0.1 | <0.1 | 2.6 | ND |
| Boring 3 | 5, 10, 15, 20 | 19 April 1989 | 3-1, 3-2, 3-3, 3-4 | WCC | Sequoia | Composite | <5 ppm (HNU) | <1.0 | <0.05 | <0.1 | <0.1 | <0.1 | 2.9 | ND |
| Boring 4 | 5, 10, 15, 20 | 20 April 1989 | 4-1, 4-2, 4-3, 4-4 | WCC | Sequoia | Composite | 10 ft. = 5 ppm, 15 ft. = 11 ppm (HNU) | 220 | <0.25 | <0.5 | <0.5 | <0.5 | 2.5 | ND |
| Boring 5 (MW-5) | 5, 10, 15, 20 | 21 April 1989 | 5-1, 5-2, 5-3, 5-4 | WCC | Sequoia | Composite | <5 ppm (HNU) | <1.0 | <0.05 | <0.1 | <0.1 | <0.1 | 2.2 | ND |
| Boring 6 | 5, 10, 15 | 19 April 1989 | 6-1, 6-2, 6-3 | WCC | Sequoia | Composite | <5 ppm (HNU) | <1.0 | <0.05 | <0.1 | <0.1 | <0.1 | 2.7 | ND |
| Boring 8 | 30.5 - 31.0 | 4 August 1989 | 8-3 | WCC | Sequoia | Grab (liner) | 339 ppm (OVM), moderate gasoline odor | 370 | <0.05 | 1.1 | 6.5 | 12 | NM | NM |
| Boring 10 | 25.5 - 26.0 | 4 August 1989 | 10-2 | WCC | Sequoia | Grab (liner) | 456 ppm (OVM) | 150 | <0.05 | 0.2 | 1.9 | 6.4 | NM | NM |
| | 30.5 - 31.0 | 4 August 1989 | 10-3 | WCC | Sequoia | Grab (liner) | 490 ppm (OVM) | 150 | <0.05 | 0.4 | 2.8 | 5.4 | NM | NM |
| Boring 12 | 30.5 - 31.0 | 4 August 1989 | 12-3 | WCC | Sequoia | Grab (liner) | 101 ppm (OVM) | 3 | 0.32 | <0.1 | <0.1 | <0.1 | NM | NM |
| Boring 14 | 16.0 - 16.5 | 4 August 1989 | 14-1 | WCC | Sequoia | Grab (liner) | 24 ppm (OVM) | <1.0 | <0.05 | <0.1 | <0.1 | <0.1 | NM | NM |
| | 26.0 - 26.5 | 4 August 1989 | 14-2 | WCC | Sequoia | Grab (liner) | 252 ppm (OVM) | 1,400 | <0.05 | 5 | 37 | 64 | NM | NM |
| Boring 15 | 30.5 - 31.0 | 7 August 1989 | 15-2 | WCC | Sequoia | Grab (liner) | <5 ppm (OVM) | 2.0 | <0.05 | <0.1 | <0.1 | <0.1 | NM | NM |
| Boring 17 | 16.0 - 16.5 | 4 August 1989 | 17-1 | WCC | Sequoia | Grab (liner) | 29 ppm (OVM) | <1.0 | <0.05 | <0.1 | <0.1 | <0.1 | NM | NM |
| | 25.5 - 26.0 | 4 August 1989 | 17-2 | WCC | Sequoia | Grab (liner) | 320 ppm (OVM), strong gasoline odor | 1,500 | <0.05 | 6 | 32 | 99 | NM | NM |
| Boring 19 (MW-19) | 30.5 - 31.0 | 7 August 1989 | MW19-1 | WCC | Sequoia | Grab (liner) | 118 ppm (OVM) | 4.4 | 0.68 | <0.1 | 0.36 | 0.53 | NM | NM |
| Boring 20 | 25.5 - 26.0 | 11 April 1990 | 20-1 | WCC | NET | Grab (liner) | slight gasoline odor | <1.0 | 0.011 | <0.0025 | <0.0025 | 0.0032 | 1.7 | NM |
| Boring 21 | 25.5 - 26.0 | 11 April 1990 | 21-1 | WCC | NET | Grab (liner) | 375 ppm (HNU), strong gasoline odor | 6,000 | <0.0025 | <0.0025 | 54 | 100 | NM | NM |
| Boring 22 | 25.5 - 26.0 | 11 April 1990 | 22-1 | WCC | NET | Grab (liner) | >500 ppm (HNU), strong gasoline odor | 9,300 | <0.0025 | 20 | 85 | 210 | 5.4 | NM |
| Boring 24 | 25.5 - 26.0 | 11 April 1990 | 24-1 | WCC | NET | Grab (liner) | 140 ppm (HNU), strong gasoline odor | 600 | <0.0025 | <0.0025 | 3.7 | 10 | NM | NM |
| Boring 29 | 25.5 - 26.0 | 11 April 1990 | 29-1 | WCC | NET | Grab (liner) | >500 ppm (OVM), strong gasoline odor | 6,000 | <0.0025 | <0.0025 | 51 | 98 | 2.2 | NM |
| PTW-1 | 24.0 - 24.5 | 14 October 1994 | PTW-1/24.0 - 24.5' | Streamborn | AEN | Grab (liner) | 200 ppm (OVM), gasoline odor | 530 | <0.20 | 0.71 | 2.3 | 3.3 | NM | NM |
| | 25.5 - 26.0 | 14 October 1994 | PTW-1/25.5 - 26.0' | Streamborn | AEN | Grab (liner) | 300 ppm (OVM), gasoline odor | 5,300 | <1.0 | 9.4 | 24 | 46 | NM | NM |

General Notes

(a) < indicates concentration below detection limit (shaded values).
(b) WCC = Woodward-Clyde Consultants (Oakland CA).
(c) Sequoia = Sequoia Analytical (Redwood City CA), NET = National Environmental Testing (Santa Rosa CA), AEN = American Environmental Network (Pleasant Hill CA).
(d) TPH-Gasoline = total petroleum hydrocarbons as gasoline.
(e) NM = not measured.
(f) Other Volatile Organic Compounds = compounds of interest per EPA Method 8240.
(g) ND = not detected (detection limits vary per compound as is normal).
(h) Field screening observations taken from boring logs. Samples screened using field organic vapor monitor (identified as HNU or OVM) equipped with a photoionization detector.

[redacted]

Groundwater Elevation Measurements

901 Jefferson Street
Oakland CA

| Date or Parameter | Measured By | Comments | MW-5 Measuring Point = Top of Well Casing at North Side. Elevation = 999.50 | | MW-18 Measuring Point = Top of Well Casing at North Side. Elevation = 999.67 | | MW-19 Measuring Point = Top of Well Casing at North Side. Elevation = 1,000.00 | | PTW-1 Measuring Point = Top of Well Casing at North Side. Elevation = 999.89 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Depth | Elevation | Depth | Elevation | Depth | Elevation | Depth | Elevation |
| 14 August 1989 | WWC | | - | 974.58 | - | 974.47 | - | 974.77 | | |
| 15 February 1991 | WWC | | - | 973.58 | - | 973.43 | - | 973.60 | | |
| 27 March 1991 | WWC | | - | 974.24 | - | 974.07 | - | 974.45 | | |
| 2 March 1993 | WWC | | - | 976.60 | - | 976.32 | - | 976.50 | | |
| 15 December 1993 | Streamborn | | 24.31 | 975.19 | 24.70 | 974.97 | 25.02 | 974.98 | | |
| 26 October 1994 | Streamborn | Immediately before sampling, prior to start of insitu bioremediation. | 24.49 | 975.01 | 24.91 | 974.76 | 25.11 | 974.89 | 24.71 | 975.18 |
| 4 November 1994 | Streamborn | Immediately before dosing event. | 24.64 | 974.86 | 25.02 | 974.65 | 24.97 | 975.03 | 24.89 | 975.00 |
| 16 November 1994 | Streamborn | Immediately before dosing event. | 24.33 | 975.17 | 24.73 | 974.94 | 24.65 | 975.35 | 24.60 | 975.29 |
| 30 November 1994 | Streamborn | Immediately before dosing event. | 24.00 | 975.50 | 24.46 | 975.21 | 24.35 | 975.65 | 24.33 | 975.56 |
| 23 December 1994 | Streamborn | Immediately before sampling, prior to dosing event. | 23.75 | 975.75 | 24.18 | 975.49 | 24.07 | 975.93 | 24.02 | 975.87 |
| 25 January 1995 | Streamborn | Immediately before dosing event. | 22.99 | 976.51 | 23.49 | 976.18 | 23.37 | 976.63 | 23.27 | 976.62 |
| 17 February 1995 | Streamborn | Immediately before sampling, prior to dosing event. | 22.27 | 977.23 | 22.80 | 976.87 | 22.44 | 977.56 | 22.56 | 977.33 |
| 7 March 1995 | Streamborn | Immediately before dosing event. | 22.02 | 977.48 | 22.57 | 977.10 | 22.21 | 977.79 | 22.34 | 977.55 |
| 30 March 1995 | Streamborn | Immediately before dosing event. | 21.36 | 978.14 | 21.93 | 977.74 | 21.58 | 978.42 | 21.68 | 978.21 |
| 7 April 1995 | Streamborn | Immediately before dosing event. | 21.26 | 978.24 | 21.78 | 977.89 | 21.38 | 978.62 | 21.57 | 978.32 |
| 18 April 1995 | Streamborn | Immediately before sampling. | 21.13 | 978.37 | 21.71 | 977.96 | 21.25 | 978.75 | 21.44 | 978.45 |
| 12 May 1995 | Streamborn | Immediately before dosing event. | 21.18 | 978.32 | 21.72 | 977.95 | 21.28 | 978.72 | 21.47 | 978.42 |
| 25 May 1995 | Streamborn | Immediately before dosing event. | 21.45 | 978.05 | 21.91 | 977.76 | 21.58 | 978.42 | 21.70 | 978.19 |
| 1 June 1995 | Streamborn | Immediately before dosing event. | 21.50 | 978.00 | 21.99 | 977.68 | 21.62 | 978.38 | 21.77 | 978.12 |
| 9 June 1995 | Streamborn | Immediately before dosing event. | 21.66 | 977.84 | 22.11 | 977.56 | 21.77 | 978.23 | 21.90 | 977.99 |
| 15 June 1995 | Streamborn | Immediately before sampling, prior to dosing event. | 21.70 | 977.80 | 22.15 | 977.52 | 21.76 | 978.24 | 21.89 | 978.00 |
| 23 June 1995 | Streamborn | Immediately before dosing event. | 21.81 | 977.69 | 22.25 | 977.42 | 21.90 | 978.10 | 22.02 | 977.87 |
| 29 June 1995 | Streamborn | Immediately before dosing event. | 21.90 | 977.60 | 22.33 | 977.34 | 22.05 | 977.95 | 22.15 | 977.74 |
| 5 July 1995 | Streamborn | Immediately before dosing event. | 21.98 | 977.52 | 22.40 | 977.27 | 22.10 | 977.90 | 22.25 | 977.64 |
| 20 July 1995 | Streamborn | Immediately before dosing event. | 22.20 | 977.30 | 22.58 | 977.09 | 22.31 | 977.69 | 22.42 | 977.47 |
| 25 July 1995 | Streamborn | Immediately before dosing event. | 22.18 | 977.32 | 22.56 | 977.11 | 22.36 | 977.64 | 22.44 | 977.45 |
| 1 August 1995 | Streamborn | Immediately before sampling, prior to dosing event. | 22.24 | 977.26 | 22.65 | 977.02 | 22.44 | 977.56 | 22.51 | 977.38 |
| 5 March 1996 | Streamborn | | 22.40 | 977.10 | 22.86 | 976.81 | 22.43 | 977.57 | 22.70 | 977.19 |
| Total Depth (last measurement) | Streamborn | | 29.5 | | 29.2 | | 30.1 | | 29.6 | |

General Notes

(a) WWC = Woodward-Clyde Consultants, Oakland CA.

(b) Groundwater elevations referenced to site-specific datum (north side, top of PVC casing at MW-19, Elevation = 1,000.00). Well elevations were re-surveyed by Streamborn on 23 December 1994. Previous water elevation measurements have been adjusted to the new datum.

(c) Measurements in units of feet.

(d) Shaded cells indicate that well did not yet exist.

Attachment 4

## Groundwater Analytical Results

901 Jefferson Street
Oakland CA

| Sample Location | Sample Date | Sampled By | Laboratory Analyses By | Sample Identification | Sample Type | TPH-Gasoline mg/L | Benzene mg/L | Toluene mg/L | Ethyl-benzene mg/L | Xylenes mg/L | Volatile Organic Compounds mg/L | Ammonia as NH3 mg/L | Nitrate as NO3 mg/L | Phosphorus as $PO_4$ mg/L | Bacteria Population cfu/ml | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-5 | 24 April 1986 | WCC | Sequoia | | Grab (bailer) | 24 | 7.5 | 0.22 | 0.81 | 0.73 | Acetone = 0.002<br>Others = ND | NM | NM | NM | NM | |
| | 14 August 1989 | WCC | Sequoia | | Grab (bailer) | 9 | 5.2 | 0.21 | 0.77 | 0.44 | Others = ND | NM | NM | NM | NM | |
| | 15 February 1991 | WCC | Sequoia | | Grab (bailer) | 13 | 7.5 | 0.25 | 1.0 | 0.34 | NM | NM | NM | NM | NM | |
| | 2 March 1993 | WCC | Sequoia | | Grab (bailer) | 32 | 4.4 | 0.17 | 0.62 | 0.26 | NM | NM | NM | NM | NM | |
| | 15 December 1993 | Streamborn | Chromalab | MW-5 (15Dec93) | Grab (bailer) | 20 | 4.4 | 0.18 | 0.76 | 0.24 | NM | NM | NM | NM | NM | |
| → | 26 October 1994 | Streamborn | AEN | MW-5 (26Oct94) | Grab (bailer) | 22 | 4.2 | 0.16 | 0.63 | 0.24 | NM | NM | NM | NM | NM | Prior to insitu bioremediation. |
| | 23 December 1994 | Streamborn | AEN | MW-5 (23Dec94) | Grab (bailer) | 20 | 3.2 | 0.15 | 0.62 | 0.24 | NM | <3.0 (field) | <0.4 (field) | <2.5 (field) | NM | |
| | 17 February 1995 | Streamborn | AEN | MW-5 (17Feb95) | Grab (bailer) | 22 | 2.6 | 0.13 | 0.41 | 0.25 | NM | <3.0 (field) | <0.4 (field) | <2.5 (field) | NM | |
| | 18 April 1995 | Streamborn | AEN, C&T, Medina | MW-5 (18Apr95) | Grab (bailer) | 3.4 | 0.15 | 0.007 | 0.009 | 0.007 | NM | <0.1 (lab)<br><3.0 (field) | <5 (lab)<br><0.4 (field) | 3.1 (lab)<br>2.5 (field) | Heterotrophic = 2 x $10^6$<br>Gas/BTEX Degrading = 2 x $10^4$<br>TPH Degrading = 3 x $10^4$ | |
| | 15 June 1995 | Streamborn | AEN | MW-5 (15Jun95) | Grab (bailer) | 6.1 | 0.27 | 0.014 | 0.020 | 0.024 | NM | <3.0 (field) | <0.4 (field) | 5.0 (field) | NM | |
| → | 1 August 1995 | Streamborn | AEN, CytoCulture | MW-5 (1Aug95) | Grab (bailer) | 5.3 | 0.19 | 0.009 | 0.007 | 0.010 | NM | <0.1 (lab) | <0.4 (lab) | 0.2 (lab) | Heterotrophic = <4 x $10^3$<br>TPH Degrading = <2 x $10^2$ | |
| | 5 March 1996 | Streamborn | AEN | MW-5 (5Mar96) | Grab (bailer) | 16 | 1.3 | 0.097 | 0.22 | 0.26 | NM | 0.16 (lab) | <0.4 (lab) | 0.55 (lab) | NM | |
| MW-18 | 14 August 1989 | WCC | Sequoia | | Grab (bailer) | 7.6 | 0.16 | 0.021 | 0.21 | 0.014 | NM | NM | NM | NM | NM | |
| | 15 February 1991 | WCC | Sequoia | | Grab (bailer) | 2.7 | 0.056 | 0.022 | 0.094 | 0.020 | NM | NM | NM | NM | NM | |
| | 2 March 1993 | WCC | Sequoia | | Grab (bailer) | 3.2 | 0.011 | 0.026 | 0.017 | 0.019 | NM | NM | NM | NM | NM | |
| | 15 December 1993 | Streamborn | Chromalab | MW-18 (15Dec94) | Grab (bailer) | 5.9 | 0.0079 | 0.039 | 0.019 | 0.028 | NM | NM | NM | NM | NM | |
| | 1 August 1995 | Streamborn | AEN, CytoCulture | MW-18 (1Aug95) | Grab (bailer) | 2.5 | 0.046 | 0.008 | 0.002 | 0.004 | NM | 0.2 (lab) | 140 (lab) | <0.2 (lab) | Heterotrophic = <2 x $10^2$<br>TPH Degrading = <2 x $10^2$ | Nitrate result is suspect. |
| | 5 March 1996 | Streamborn | AEN | MW-18 (5Mar96) | Grab (bailer) | 9.1 | 0.20 | 0.029 | 0.047 | 0.022 | NM | 0.17 (lab) | 17 (lab) | 0.61 (lab) | NM | |
| PTW-1 | 26 October 1994 | Streamborn | AEN, C&T | PTW-1 (26Oct94) | Grab (bailer) | 23 | 1.7 | 0.44 | 0.88 | 2.1 | NM | <0.1 (lab) | <1 (lab) | <1.5 (lab) | NM | Prior to insitu bioremediation. |
| | 23 December 1994 | Streamborn | - | PTW-1 (23Dec94) | Grab (bailer) | NM | NM | NM | NM | NM | NM | 3.0 (field) | <0.4 (field) | <2.5 (field) | NM | |
| | 17 February 1995 | Streamborn | AEN | PTW-1 (17Feb95) | Grab (bailer) | 5.8 | 0.11 | 0.012 | 0.023 | 0.040 | NM | 3.0 (field) | <0.4 (field) | <2.5 (field) | NM | |
| | 18 April 1995 | Streamborn | AEN, C&T, Medina | PTW-1 (18Apr95) | Grab (bailer) | 2.7 (2) | 0.035 | 0.003 | 0.005 | 0.010 | NM | 3.2 (lab)<br>6.0 (field) | <5 (lab)<br><0.4 (field) | 3.1 (lab)<br><2.5 (field) | Heterotrophic = 7 x $10^6$<br>Gas/BTEX Degrading = 9 x $10^5$<br>TPH Degrading = 1 x $10^6$ | |
| | 15 June 1995 | Streamborn | AEN | PTW-1 (15Jun95) | Grab (bailer) | 2.9 | 0.044 | 0.0005 | 0.005 | 0.015 | NM | 10 (field) | 1.3 (field) | 7.5 (field) | NM | |
| | 1 August 1995 | Streamborn | AEN, CytoCulture | PTW-1 (1Aug95) | Grab (bailer) | 0.8 | 0.009 | <0.0005 | <0.0005 | <0.002 | NM | 19 (lab) | <0.4 (lab) | 10 (lab) | Heterotrophic = 4 x $10^5$<br>TPH Degrading = 6 x $10^5$ | |
| | 5 March 1996 | Streamborn | AEN | PTW-1 (5Mar96) | Grab (bailer) | 5.4 | 0.24 | 0.021 | 0.046 | 0.077 | NM | 4.9 (lab) | <0.4 (lab) | 1.6 (lab) | NM | |
| MW-19 | 14 August 1989 | WCC | Sequoia | | Grab (bailer) | 26 | 4.3 | 0.69 | 0.98 | 2.6 | NM | NM | NM | NM | NM | |
| | 15 February 1991 | WCC | Sequoia | | Grab (bailer) | 13 | 1.8 | 0.64 | 0.51 | 2.6 | NM | NM | NM | NM | NM | |
| | 2 March 1993 | WCC | Sequoia | | Grab (bailer) | 46 | 10 | 1.1 | 1.7 | 4.5 | NM | NM | NM | NM | NM | 1/4-inch floating product observed during sampling - sample results may not be representative of dissolved concentrations. |
| | 15 December 1993 | Streamborn | Not Analyzed | Not Analyzed | Grab (bailer) | NM | NM | NM | NM | NM | NM | NM | NM | NM | NM | Approximately 1/3-inch floating product observed in well. Accordingly, well not sampled. |
| | 15 June 1995 | Streamborn | AEN | MW-19 (15Jun95) | Grab (bailer) | 15 | 0.25 | 0.10 | 0.13 | 0.27 | NM | <3.0 (field) | <0.4 (field) | 5.0 (field) | NM | |
| | 1 August 1995 | Streamborn | AEN, CytoCulture | MW-19 (1Aug95) | Grab (bailer) | 12 | 0.17 | 0.088 | 0.13 | 0.30 | NM | <0.1 (lab) | <0.4 (lab) | <0.2 (lab) | Heterotrophic = 2 x $10^3$<br>TPH Degrading = 1 x $10^4$ | |
| | 5 March 1996 | Streamborn | AEN | MW-19 (5Mar96) | Grab (bailer) | 18 | 0.32 | 0.12 | 0.26 | 0.53 | NM | 0.12 (lab) | <0.4 (lab) | 0.5 (lab) | NM | |

General Notes
(a) Volatile Organic Compounds = Compounds per EPA Method 8240 (GC/MS).
(b) ND = Not detected (shaded value). Detection limit varied according to compound, as is normal.
(c) NM = Not measured.
(d) cfu/ml = colony forming units per milliliter.
(e) < = Indicates measurement below analytical detection limit (shaded value).
(f) WCC = Woodward-Clyde Consultants (Oakland CA).
(g) AEN = American Environmental Network (Pleasant Hill CA), Sequoia = Sequoia Analytical (Redwood City CA), C&T = Curtis & Thompkins (Berkeley CA), Medina = Medina Bioremediation Division (Hondo TX), CytoCulture = CytoCulture (Point Richmond CA).
(h) Bacteria population analyses performed by Medina Bioremediation Division or CytoCulture Laboratory analyses for ammonia, nitrate, and phosphate were performed by American Environmental Network or Curtis & Thompkins.
(j) Ammonia, nitrate, and phosphate concentrations measured in the laboratory (lab), as well as using field test kits (field).

Footnotes
(1) The lower bacteria populations detected in the 1 August 1995 groundwater samples (compared to the 18 April 1995 results) are likely due to a shorter sample incubation period used by CytoCulture. CytoCulture incubated samples for 3 days while Medina incubated samples for 10 days. Other differences in the analytical protocols used by the laboratories may also affect the comparability of the results.
(2) Laboratory reported that the chromatogram for this sample was not characteristic of gasoline.