5-27-99
ved

Nestle Oakland Facility
Support Showing the Site is a Low-Risk Soil and Groundwater Case

SITE HISTORY

The former facility was used to manufacture ice cream and packaged milk. The facility was also used for the distribution of ice cream and packaged fresh milk by trucks. The delivery trucks were fueled at dispensers near service bays located at the northwest corner of the site and were repaired and maintained on the site. Fueling and maintenance operations used the following underground storage tanks (USTs):

- 1 used-oil tank (1,000-gallon capacity)
- 2 gasoline tanks (10,000-gallon capacity each)
- 2 diesel fuel tanks (12,000-gallon capacity each)

The fuel system at the site also included underground piping that connected the USTs to the dispensers outside of the service bays.

The past release of fuel into soil at the site has resulted in the presence of fuel chemicals at the site in three ways: as concentrations of hydrocarbons in subsurface soil, as a layer of fuel floating on groundwater (liquid-phase hydrocarbons, or NAPL), and as concentrations of hydrocarbons dissolved in groundwater (dissolved-phase hydrocarbons).

1. The leak has been stopped and ongoing sources, including free product, have been removed or remediated.

Tank, Line, and Dispenser Removal

Four underground fuel storage tanks and associated piping were removed on 19 December 1988. One 1,000-gal. used-oil tank was removed on 12 January 1989. Each of the removal actions was documented in an AGE Report (AGE April 1989). (Figure 1)

Remedial Actions

Soil Excavation: Between January and March of 1989, 1,200 cubic yards of soil were removed in the area of the former tanks and lines. This soil was treated on-site and replaced into the excavation. (Figure 1)

Product Skimming: Product skimming was initiated in January 1989. Between January and March 1989 approximately 1,800 gallons of NAPL were recovered (AGE April 1989).

Soil Vapor Extraction: An SVE system was operated from January 1994 to December 1995 and removed an estimated 5,200 gallons of hydrocarbon equivalent (Park 1994, EA July 1996). (Figure 2)

Multi-Phase Extraction: A multi-phase extraction system has been operating at the site since August 1997. To date a total of 9,400 pounds of hydrocarbons have been removed. Product levels have decreased since August 1997, and hydrocarbon recovery rates have reached an asymptotic level. (Figures 1, 3-5)

2. The site has been adequately characterized.

To date, more than 150 wells have been installed at the site. From the borings for the wells and additional soil borings, the site geology and hydrocarbon distribution have been adequately characterized.

Not easterly direction - high conc. of hydrocarbons

Geology and Hydrogeology: Borings at the site have been drilled to depths between 10 and 25 feet below grade. Soils at the site are predominantly clayey or silty sands (SC, SM) with a hydraulic conductivity of about 30 ft/day (HLA September 1991). The site is located in an area underlain by Merritt Sand (Radbruch 1957). Due to its limited extent and thickness, the Merritt Sand is generally not considered a drinking water resource (ACFCD 1988). (Figures 6-9)

Water currently is found at a depth of 7 feet below grade and has ranged between 5 and 12 feet. Groundwater flow direction is generally toward the north-northwest (16th Street) at a gradient of 0.002 ft/ft.

Soil Characterization: The highest TPH-g levels found at the site were measured in the area currently being remediated and were located at a depth of 10 ft below grade. The maximum TPH-g concentration found in the shallow soils located at 5 ft below grade was 2,500 mg/kg. The soil borings were installed to a depth of 20 ft and generally contained no TPH-g above the detection limit. The maximum TPH-g level measured at 20 ft was 260 mg/kg (HLA September 1991). The soil boring data indicate that the TPH impacts to the soil are limited to a depth of 10 to 15 ft below grade. (Figures 10-14)

Groundwater Characterization: The current groundwater results show that the dissolved TPH-g and benzene concentrations are limited to the area currently being treated and downgradient at well MW26 found on the south side of 16th Street. Concentrations of TPH-d have also been measured in some wells on the west side of the site (ETIC report in progress). (Figure 15)

Dissolved concentrations of HVOCs have been measured in the area currently being remediated and downgradient in 16th Street. The predominant HVOC chemical found at the site is 1,2-DCA, which has a current maximum concentration of 72 ug/L found in MW25. Groundwater monitoring data show no predominant source of HVOCs. (Figures 15, 16)

3. The dissolved hydrocarbon plume is not migrating.

Stability of Dissolved Hydrocarbon Plume: Five wells located in 16th Street monitor the downgradient edge of the plume. Some concentrations of benzene and TPH-g have been measured in the most downgradient wells (MW28 and MW29) but in general they have not been above detectable concentrations. (Figures 15, 16, 17a-d)

Stability of LPH:
Over 50 wells are used to monitor the location of free phase hydrocarbons. Gauging to date shows the product is not migrating. This statement is based on the following facts:

- The number of wells containing detectable amounts of LPH has been decreasing since LPH recovery using multi-phase extraction was initiated in late 1997.
- LPH has not been detected in any well outside the group of wells that have historically contained measurable thickness. (Figures 3, 4, 18)

Stability of HVOC Compounds: Detectable concentrations of 1,2-DCA have been measured in downgradient wells MW25, MW26, MW28, and MW29. Although the concentrations of 1,2-DCA are variable and have been as high as 180 ug/L, they are not increasing and in the case of MW28 appear to be decreasing. (Figures 16, 19a-c)

4. No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted.

No state, federal, or public water supply wells are located within 1 mile of the site (EDR 1997). In addition to using Environmental Data Resources, Inc. to search federal, state, and public databases, the databases of the East Bay Municipal Utility District and the Alameda County Public Works Agency were searched. The results of this search show that there are no private water supply wells within ¼-mile downgradient of the site (ACPWA 1997, EBMUD 1997). (Figures 20-21)

No deeper drinking water aquifers are likely to be impacted by subsurface conditions found at the Nestle site. The Merritt Sand found beneath the Nestle site is underlain by the Alameda Formation. The upper portion of the Alameda Formation is composed of sandy and silty clay and because of its low permeability and thickness is generally considered to be an aquitard separating the overlaying Merritt Sand and other deposits from the underlying sands and gravels of the Alameda Formation.

There is no surface water found within 1 mile of the site.

5. The site presents no significant risk to human health.

The conceptual model for the site shows the following potential exposure pathways may be complete:

- Dermal contact and ingestion by on-site construction workers;
- Inhalation of vapors and particulates by on-site industrial workers or on-site construction workers.

The exposure route of inhalation of vapors by off-site residents was also evaluated as a future scenario. Based on development of a SCM and results of the preliminary RBCA analysis, the following conclusions and recommendations are developed with regard to future action at the Nestle Oakland Facility (Figures 22a-d):

- Based on available data, the primary COPCs at the site are benzene and 1,2 DCA in groundwater;
- Human receptors subject to potential exposure to site contaminants include on-site industrial workers and on-site construction workers;
- The carcinogenic risk (4.61E-6) and noncarcinogenic hazard (7.71E-2) for inhalation of indoor air by on-site industrial workers are within acceptable levels.
- Available data at the site allow for evaluation of complete exposure pathways (inhalation of volatiles in indoor and ambient air) associated with groundwater;
- In the absence of on-site and nearby off-site wells, and the unlikelihood of future groundwater development in the vicinity of the site, ingestion of groundwater is assumed to be an incomplete pathway;
- Based on evaluation of complete groundwater exposure pathways (i.e., inhalation of volatiles in indoor and ambient air), contaminants in groundwater at the site do not pose a significant risk to on-site industrial workers (carcinogenic risk 4.61E-6 and noncarcinogenic hazard 7.71E-2);
- The hypothetical scenario of an off-site residence was evaluated and found to be within acceptable risk levels (carcinogenic risk 1.18E-7 and noncarcinogenic hazard 1.23E-3);

6. The site presents no significant risk to the environment.

The Nestle site is located in a mixed industrial/residential portion of west Oakland and does not provide a habitat capable of supporting significant terrestrial wildlife and avian communities.

REFERENCES

ACFCD (Alameda County Flood Control and Water Conservation District). 1988. Geohydrology and Groundwater –Quality Overview. East Bay Plain Area, Alameda County, California. 205J Report. 83 pp. (as cited in Dames & Moore 1988, Site Contamination Assessments, Carnation Dairy Facility, 1310 14th Street, Oakland, CA; and Carnation Distribution Center, 891 Laurelwood Road, Santa Clara, CA, 2 August).

ACPWA (County of Alameda Public Works Agency). 1997. Well Inventory File (1 mile radius search for 1310 14th Street, Oakland, California). ACPWA, Hayward, California. November.

AGE (Anania Geologic Engineering). 1989. Remedial Action Plan for the Carnation Oakland Dairy Facility Located at 1310 14th Street, Oakland, California, Alameda County. AGE, Rancho Cordova, California. 3 April.

EA (EA Engineering, Science, and Technology). 1996. Product Recoverability and Vapor Extraction/Air Sparging Pilot Test Report for the Nestle USA Former Carnation Dairy Facility, 1310 14th Street, Oakland, California. EA, Lafayette, California. July.

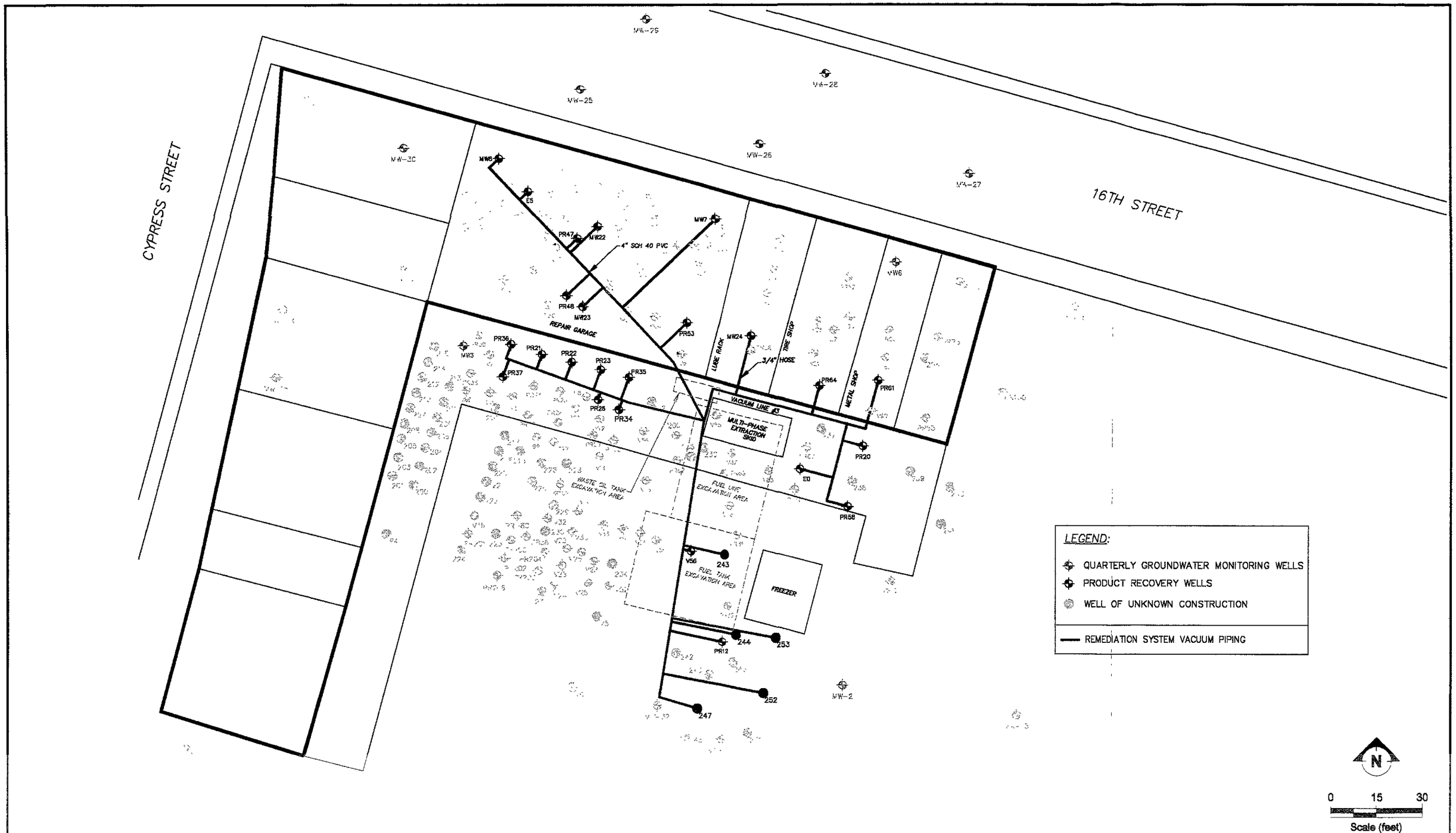
EBMUD (East Bay Municipal Utility District). 1997. EBMUD Backflow Prevention Program (database search for backflow devices in western Oakland). EBMUD, Oakland, California. October.

EDR (Environmental Data Resources, Inc.). 1997. EDR-Radius Map with GeoCheck for Nestle Facility, 1310 14th Street, Oakland, California. EDR, Southport, Connecticut. October.

HLA (Harding Lawson Associates). 1991. Site Characterization Report, Carnation Facility, Oakland, California. HLA, Novato, California. 17 September.

Park (Park Environmental). 1994. Vapor Extraction Remediation Update, October 1993 through April 1994, Carnation Company Facility, 1310 14th Street, Oakland, California. Park, Rocklin, California. 19 May.

Radbruch. 1957. Areal and Engineering Geology of the Oakland West Quadrangle, California, U.S. Geological Survey, Miscellaneous Geologic Investigations, Map I-239. (as cited in Dames & Moore 1988, Site Contamination Assessments, Carnation Dairy Facility, 1310 14th Street, Oakland, CA; and Carnation Distribution Center, 891 Laurelwood Road, Santa Clara, CA, 2 August).



ETIC Engineering, Inc.

NESTLE OAKLAND FACILITY
SITE PLAN SHOWING FORMER USTs, PIPING, DISPENSERS, AND EXCAVATION AREA

FIGURE: 1

Figure 1

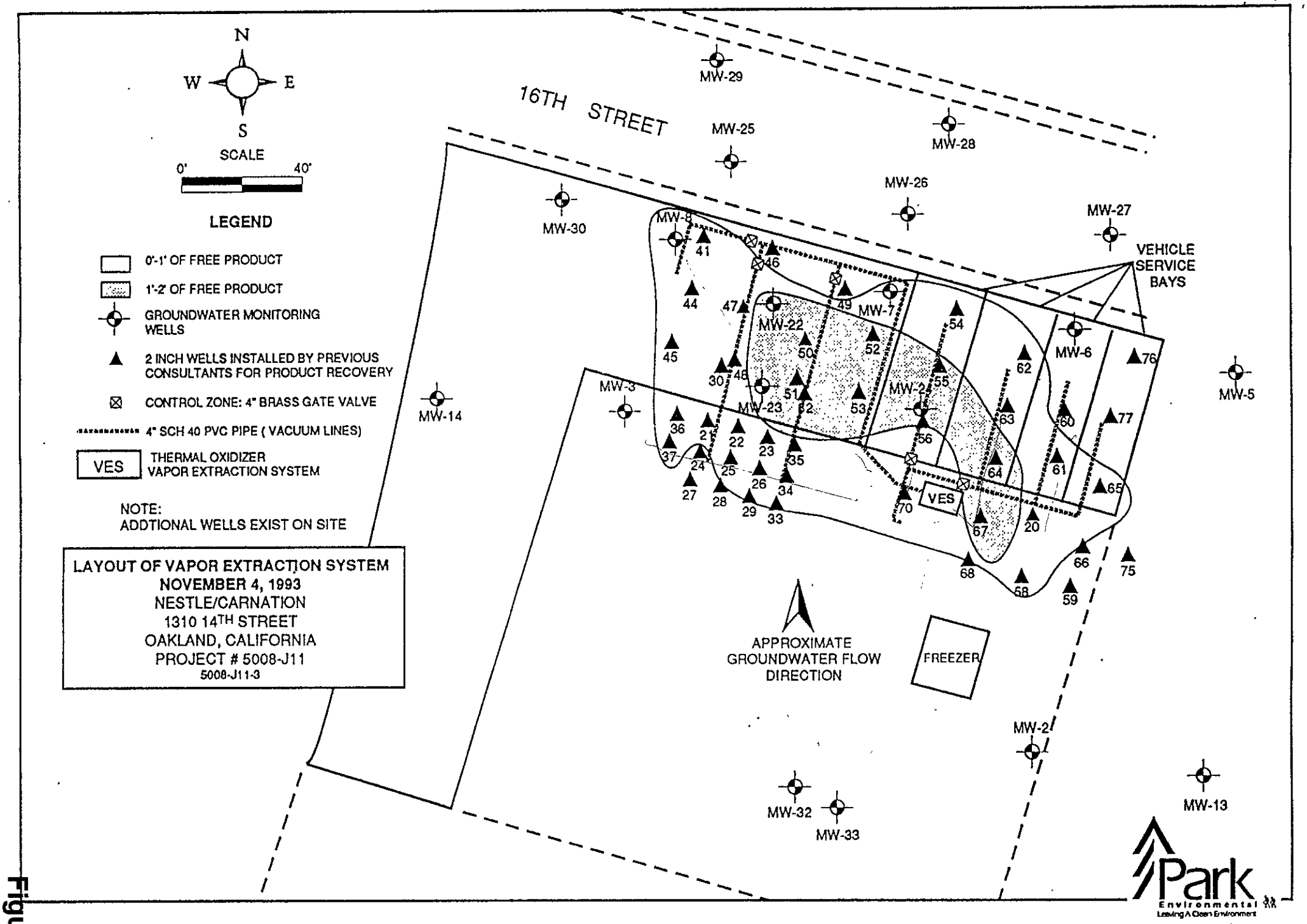

N
W
E
S
SCALE
0'
40'
LEGEND
0'-1' OF FREE PRODUCT
1'-2' OF FREE PRODUCT
GROUNDWATER MONITORING WELLS
2 INCH WELLS INSTALLED BY PREVIOUS CONSULTANTS FOR PRODUCT RECOVERY
CONTROL ZONE: 4" BRASS GATE VALVE
4" SCH 40 PVC PIPE (VACUUM LINES)
VES
THERMAL OXIDIZER VAPOR EXTRACTION SYSTEM
NOTE:
ADDTIONAL WELLS EXIST ON SITE
LAYOUT OF VAPOR EXTRACTION SYSTEM
NOVEMBER 4, 1993
NESTLE/CARNATION
1310 14TH STREET
OAKLAND, CALIFORNIA
PROJECT # 5008-J11
5008-J11-3
16TH STREET
MW-29
MW-25
MW-28
MW-26
MW-27
MW-30
MW-8
MW-7
MW-22
MW-6
MW-5
MW-14
MW-3
MW-23
MW-24
VES
VEHICLE SERVICE BAYS
APPROXIMATE GROUNDWATER FLOW DIRECTION
FREEZER
MW-2
MW-32
MW-33
MW-13
Park Environmental
Leaving A Clean Environment

Figure 2

LPH THICKNESS IN MONITORING WELLS

Nestle Oakland Facility, 1310 14th Street, Oakland, California

Liquid Phase Hydrocarbon Monitoring Results	November 1997	April 1998	May-October 1998	November 1998	January 1999	February 1999	March 1999	May 1999
Total number of wells monitored (of wells that have contained LPH)	57	59	58	58	27	64	36	59
Wells containing no detectable LPH	26	39	31	52	22	53	24	50
Wells containing between 0.01 and 1.0 feet of LPH	18	14	21	6	5	11	12	8
Wells containing >1.0 feet of LPH	13	6	6	0	0	0	0	1

Figure 3

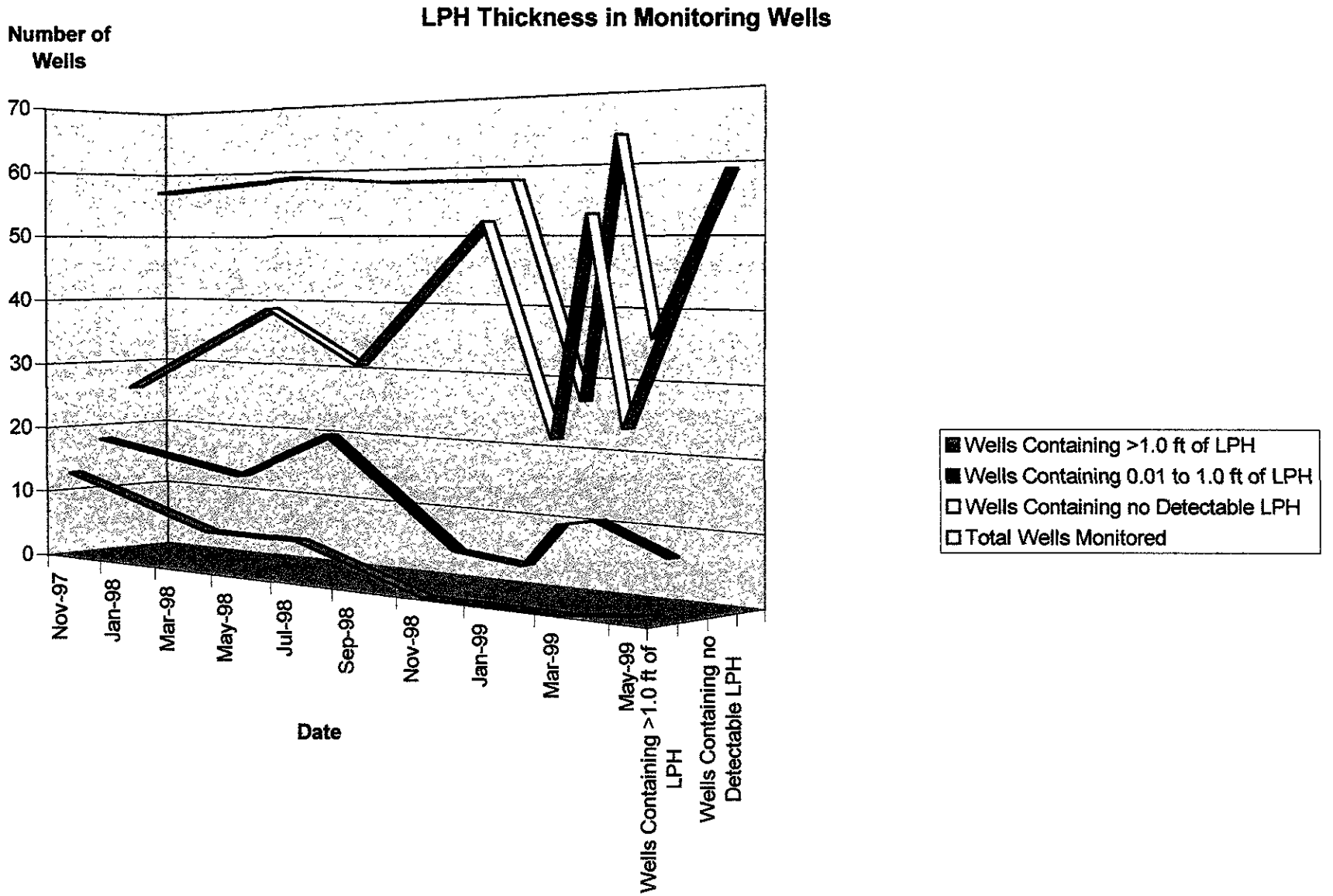

LPH Thickness in Monitoring Wells
Number of Wells
70
60
50
40
30
20
10
0
Nov-97
Jan-98
Mar-98
May-98
Jul-98
Sep-98
Nov-98
Jan-99
Mar-99
May-99
Date
Wells Containing >1.0 ft of LPH
Wells Containing 0.01 to 1.0 ft of LPH
Wells Containing no Detectable LPH
Total Wells Monitored

Figure 4

Figure 7: Total Pounds of Hydrocarbons Removed from Groundwater and Vapor Effluents and as Free Product Nestle' Facility, 1310 14th Street, Oakland, California

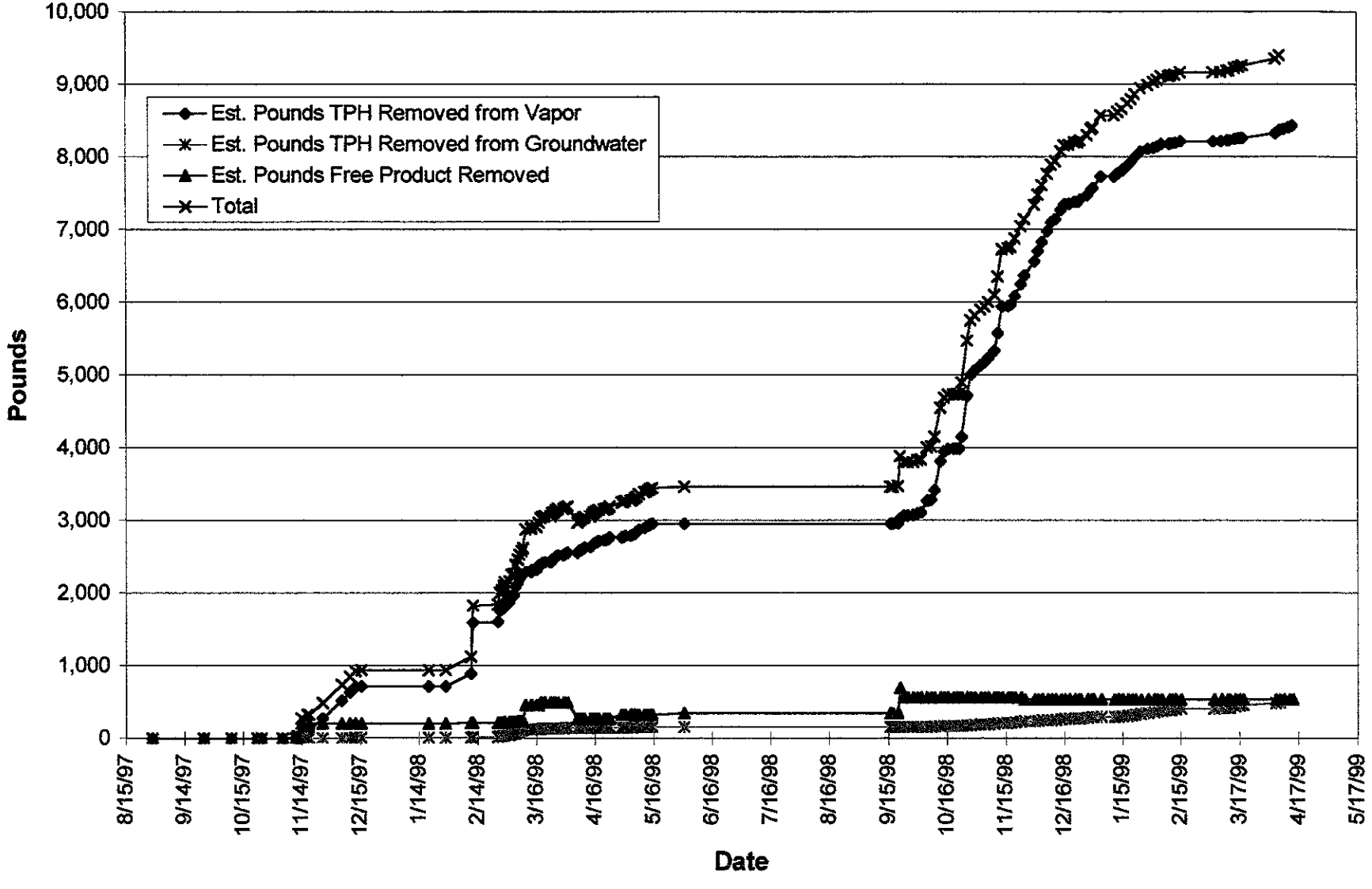
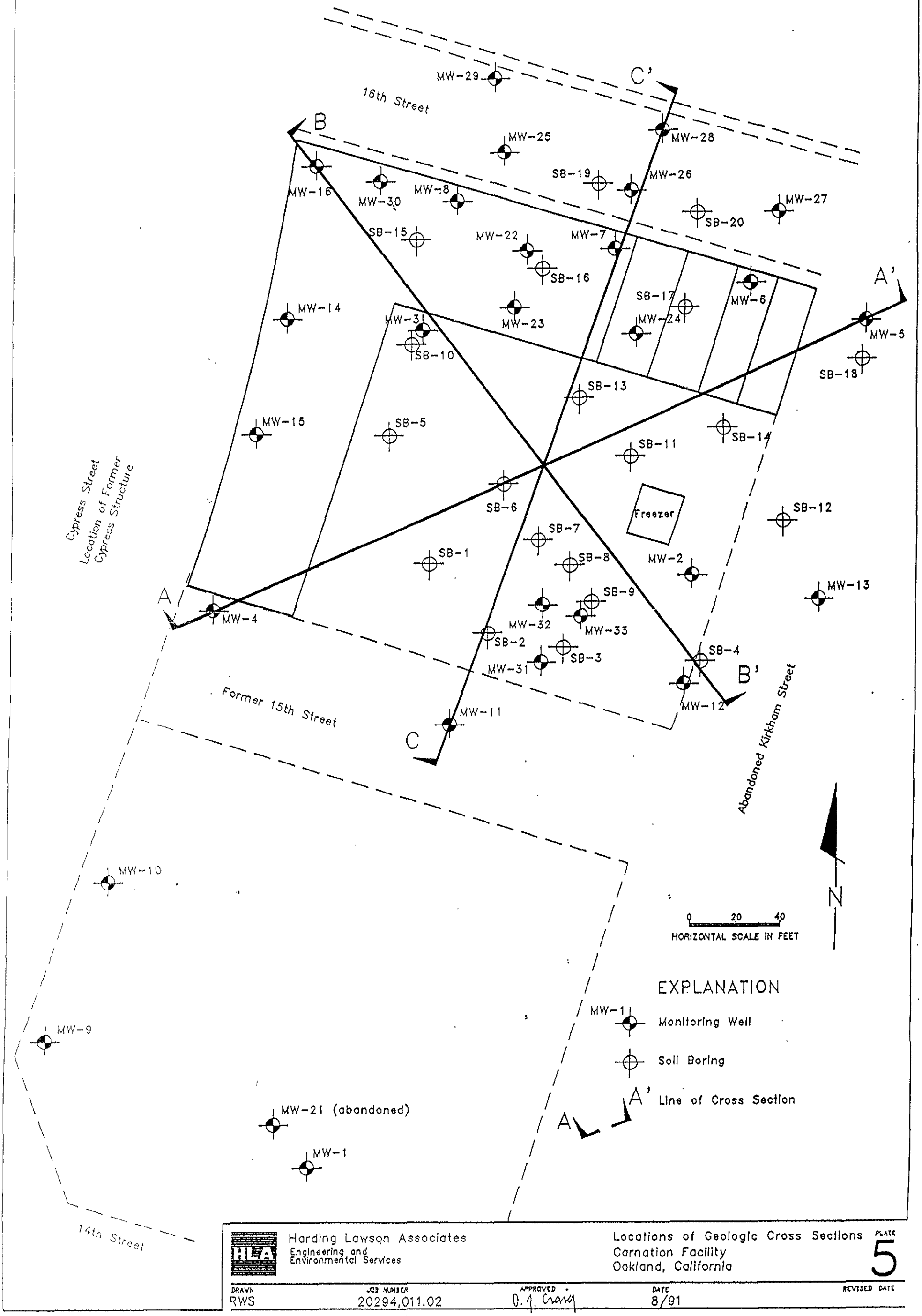


Figure 5

23165



Harding Lawson Associates
Engineering and
Environmental Services

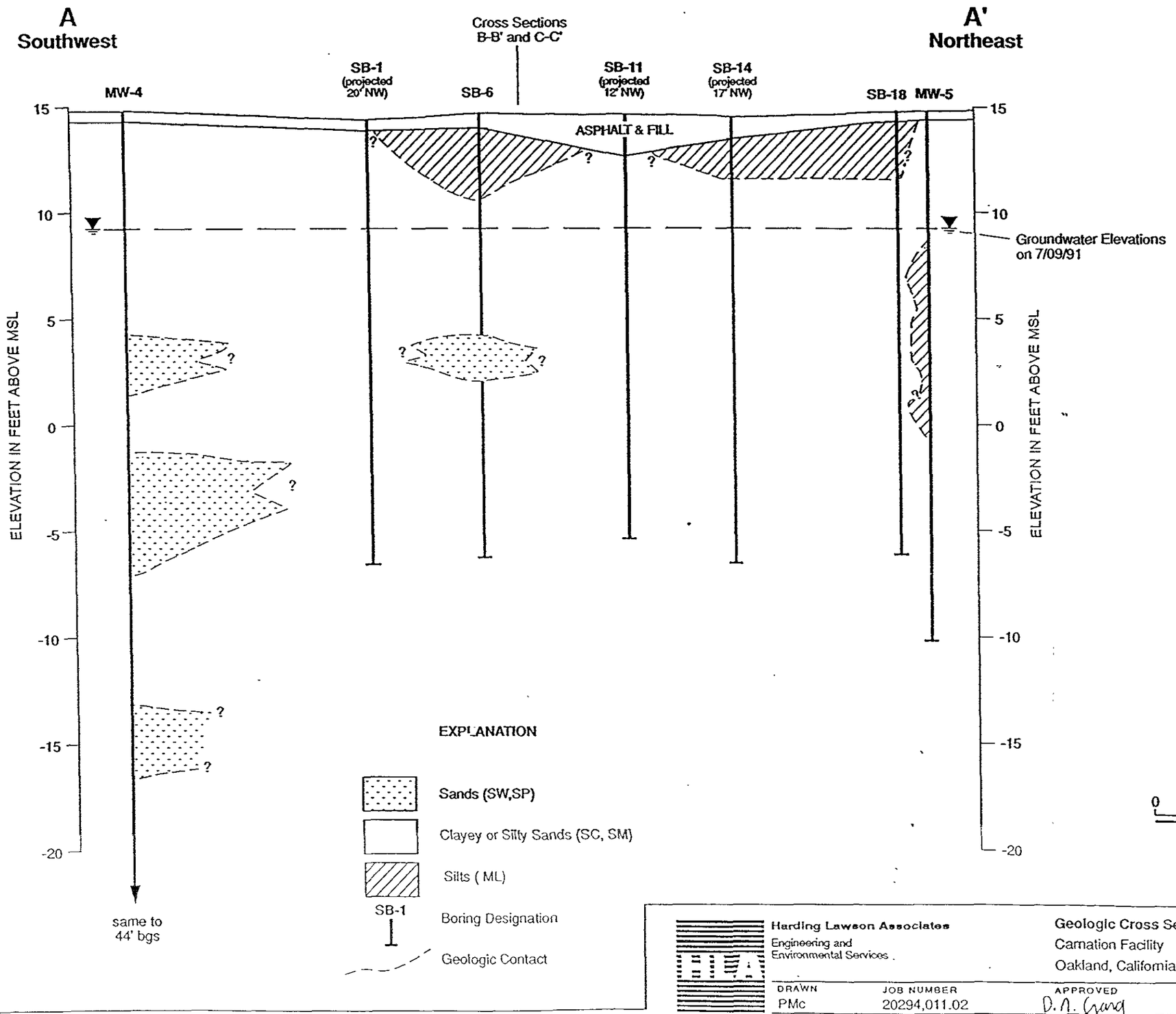
Locations of Geologic Cross Sections
Carnation Facility
Oakland, California

PLATE 5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RWS	20294,011.02	D. J. Craig	8/91	

Figure 6

23166



Harding Lawson Associates
Engineering and
Environmental Services

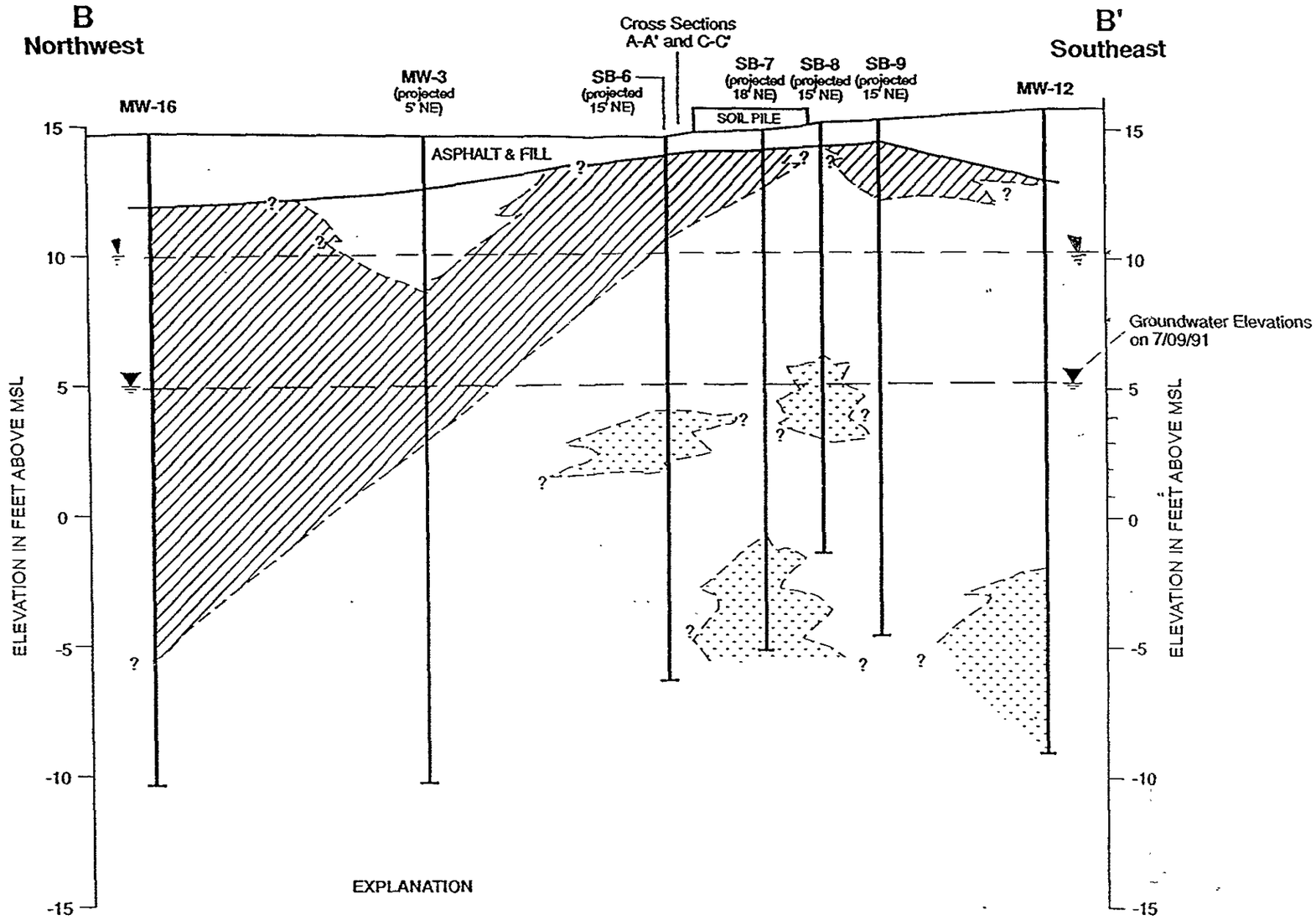
Geologic Cross Section A-A'
Carnation Facility
Oakland, California

PLATE
6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
PMc	20294,011.02	D.A. Craig	8/91	

Figure 7

23167



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Environmental Services

Geologic Cross Section B-B'
Carnation Facility
Oakland, California

PLATE
7

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
PMc	20294,011.02	D. J. Craig	8/91	

Figure 8

23168

C
South

C'
North

Cross Sections
A-A' and B-B'

MW-11 | SB-2 (projected 4' NW) | SB-7 (projected 9' NW) | SB-6 (projected 10' SE) | SB-13 (projected 8' NW) | MW-7 | MW-26 (projected 5' SE) | MW-28

SOIL PILE

ASPHALT & FILL

16th Street

ELEVATION IN FEET ABOVE MSL

15
10
5
0
-5
-10
-15

Groundwater Elevations on 7/09/91

EXPLANATION

- Sands (SW,SP)
- Clayey or Silty Sands (SC, SM)
- Silts (ML)
- SB-1 — Boring Designation
- Geologic Contact

0 40 80

HORIZONTAL SCALE IN FEET

Vertcal Exaggeration = 8x

0913PM

Harding Lawson Associates
Engineering and Environmental Services

Geologic Cross Section C-C'
Carnation Facility
Oakland, California

PLATE 8

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
PMc	20294,011.02	D. J. Craig	8/91	

Figure 9

23162

16th Street

SB-19 ND/ND

SB-20 ND/17

SB-15 ND/ND

SB-16 550/21

SB-17 1.1/110

SB-18 ND/ND

SB-10 26/17

SB-13 320/27

SB-14 2,500/470

SB-5 ND/ND

SB-11

SB-6 600/15

Freezer

SB-12 ND/ND

SB-7

SB-1 ND/26

SB-8

SB-9

SB-2 ND/ND

SB-3

SB-4 ND/ND

Cypress Street
Location of Former
Cypress Structure

Former 15th Street

Abandoned Kirkham Street

14th Street

N

0 20 40
HORIZONTAL SCALE IN FEET

SB-12

EXPLANATION

Soil Boring

26/17 — TPH as Gasoline; TPH as Diesel concentrations in mg/kg

ND — Chemical not detected

Harding Lawson Associates
Engineering and Environmental Services

TPH in Soil at Approximately 5 Feet
Carnation Facility
Oakland, California

PLATE 9

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RWS	20294,011.02	D. J. Craig	8/91	

Figure 10

23170

16th Street

SB-19 ND/ND

SB-20 820/65

SB-15 3.2/57

SB-16 6,400/940

SB-17 10,000/810

SB-18 ND/ND

SB-10 1,200/260

SB-13 NS/NS

SB-14 1,400/670

SB-5 ND/ND

SB-11

SB-6 1,900/170

Freezer

SB-12 ND/ND

SB-7

SB-1 ND/ND

SB-8

SB-9

SB-2 ND/ND

SB-3

SB-4 ND/ND

Cypress Street
Location of Former
Cypress Structure

Former 15th Street

Abandoned Kirkham Street

14th Street

0 20 40
HORIZONTAL SCALE IN FEET

N

EXPLANATION

SB-12 Soil Boring

26/17 TPH as Gasoline / TPH as Diesel concentrations in mg/kg

ND Chemical not detected

NS Soil not Sampled

CARNSB.DWG

Harding Lawson Associates
Engineering and
Environmental Services

TPH in Soil at Approximately
10 Feet
Carnation Facility
Oakland, California

PLATE 10

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RWS	20294,011.02	D. J. Craig	8/91	

Figure 11

23171

16th Street

SB-19 ND/ND

SB-20 ND/ND

SB-15 ND/ND

SB-16 100/45

SB-17 88/45

SB-18 ND/ND

SB-10 ND/ND

SB-13 2.0/ND

SB-14 6.9/6.6

SB-5 ND/ND

SB-11

SB-6 350/86

Freezer

SB-12 ND/ND

SB-7

SB-1 ND/ND

SB-8

SB-9

SB-2 ND/ND

SB-3

SB-4 ND/ND

Cypress Street
Location of Former
Cypress Structure

Former 15th Street

Abandoned Kirkham Street

14th Street

N

0 20 40
HORIZONTAL SCALE IN FEET

EXPLANATION

SB-12 Soil Boring

26/17 TPH as Gasoline / TPH as Diesel concentrations in mg/kg

ND Chemical not detected

CARN88.DWG

Harding Lawson Associates
Engineering and Environmental Services

TPH in Soil at Approximately 12.5 Feet
Carnation Facility
Oakland, California

PLATE 11

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RWS	20294,011.02	D. J. Craig	8/91	

Figure 12

23172

16th Street

SB-19 ND/ND

SB-20 ND/ND

SB-15 ND/ND

SB-16 1,900/59

SB-17 130/130

SB-18 ND/ND

SB-10 ND/ND

SB-13 1.6/ND

SB-14 1.1/ND

SB-5 ND/ND

SB-11

SB-6 180/37

Freezer

SB-12 ND/ND

SB-7

SB-1 ND/ND

SB-8

SB-9

SB-2 ND/ND

SB-3

SB-4 ND/ND

Cypress Street
Location of Former
Cypress Structure

Former 15th Street

Abandoned Kirkham Street

14th Street

N

0 20 40
HORIZONTAL SCALE IN FEET

EXPLANATION

SB-12 Soil Boring

26/17 TPH as Gasoline / TPH as Diesel concentrations in mg/kg

ND Chemical not detected

Harding Lawson Associates
Engineering and Environmental Services

TPH in Soil at Approximately 15 Feet
Carnation Facility
Oakland, California

PLATE 12

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RWS	20294,011.02	D. A. Craig	8/91	

CARNSB.DWG

Figure 13

23173

16th Street

SB-19 ND/ND

SB-20 ND/ND

SB-15 ND/ND

SB-16 260/2.8

SB-17 ND/ND

SB-18 ND/ND

SB-10 ND/ND

SB-13 ND/ND

SB-14 ND/ND

SB-5 ND/ND

SB-11

SB-6 ND/23

Freezer

SB-12 ND/ND

SB-7

SB-1 ND/ND

SB-8

SB-9

SB-2 ND/ND

SB-3

SB-4 ND/ND

Cypress Street
Location of Former
Cypress Structure

Former 15th Street

Abandoned Kirkham Street

14th Street

0 20 40
HORIZONTAL SCALE IN FEET

N

EXPLANATION

SB-12 Soil Boring

26/17 TPH as Gasoline / TPH as Diesel concentrations in mg/kg

ND Chemical not detected

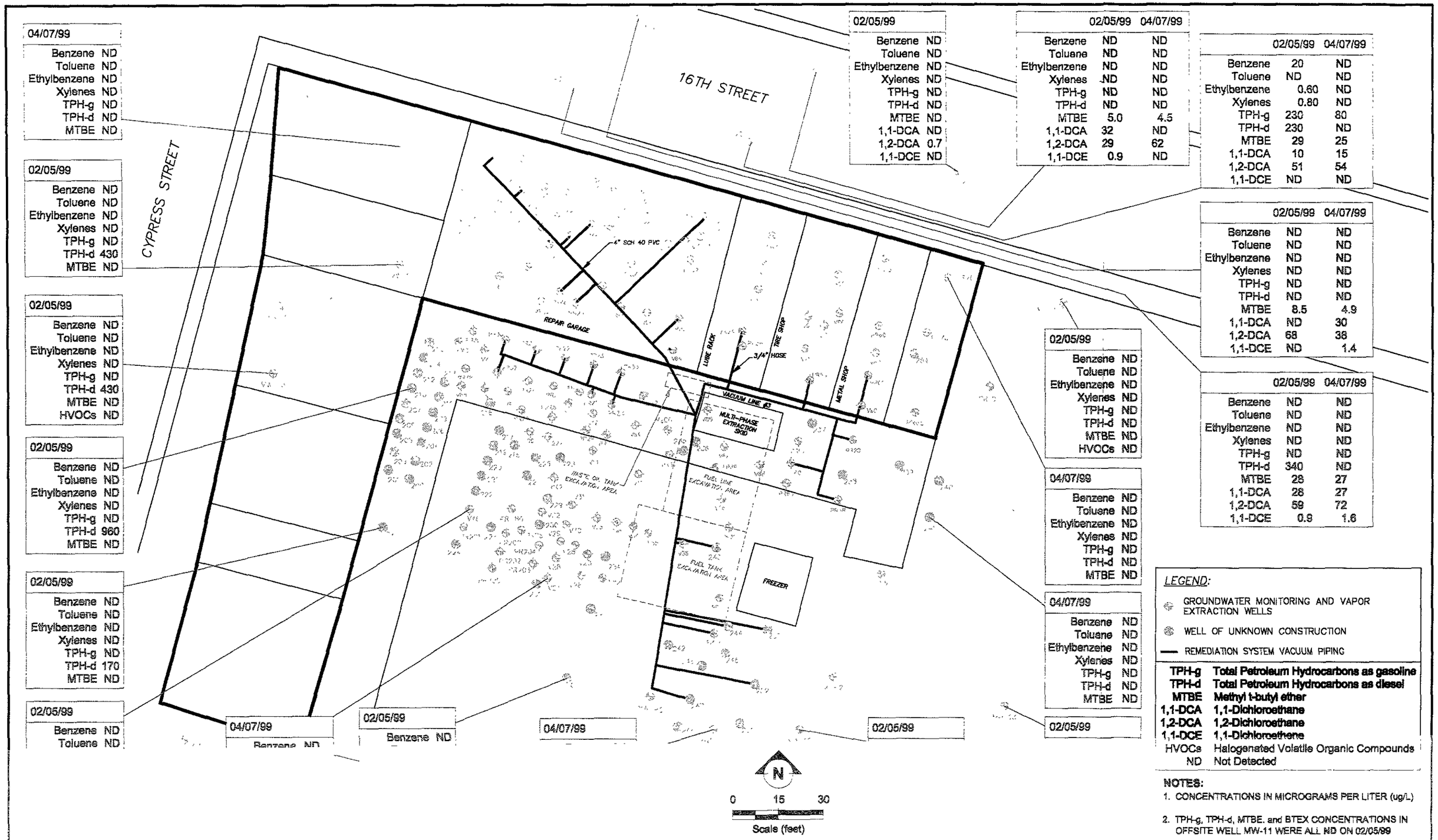
Harding Lawson Associates
Engineering and
Environmental Services

TPH in Soil at Approximately
20 Feet
Carnation Facility
Oakland, California

PLATE 13

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
RWS	20294,011.02	D.J. Curry	8/91	

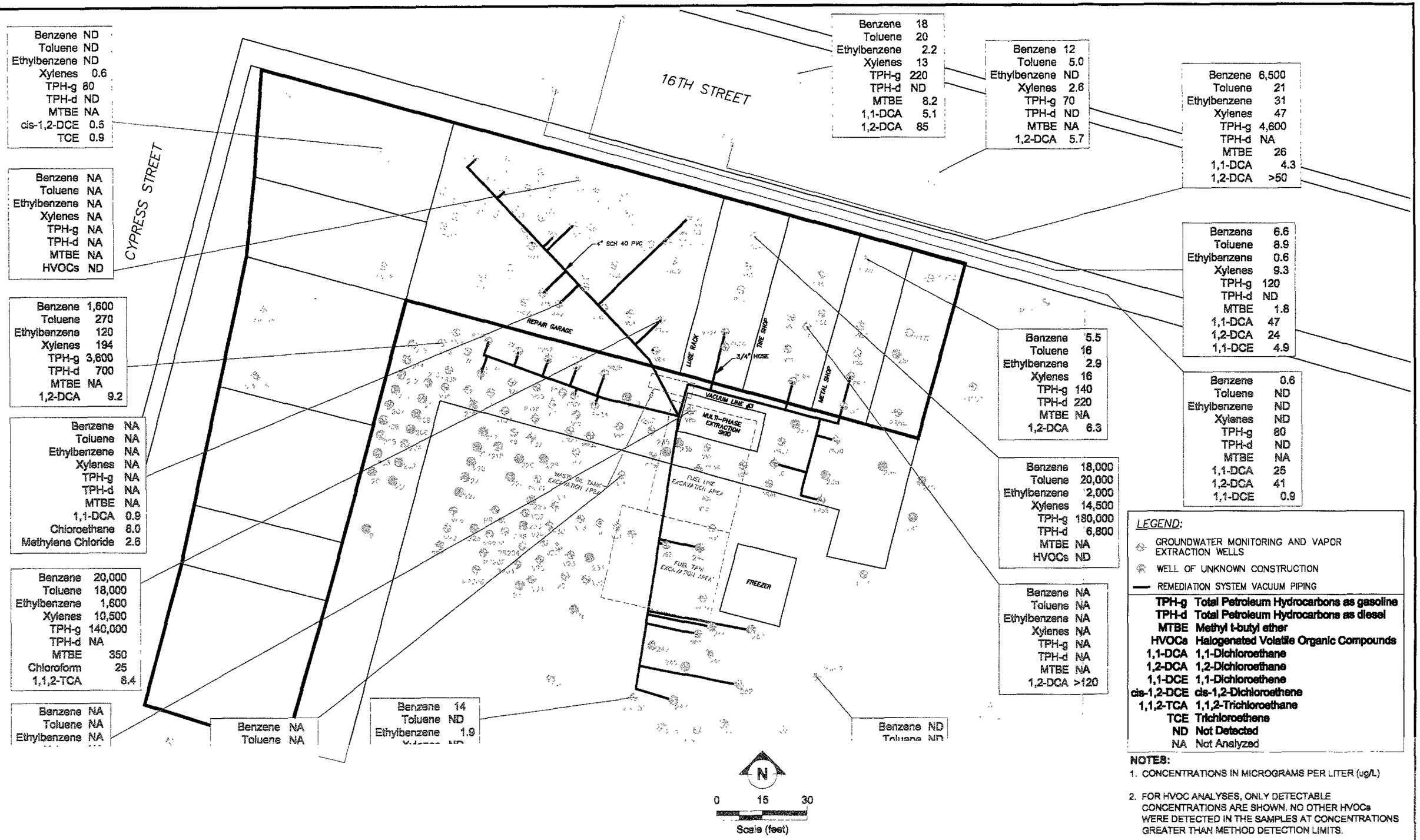
Figure 14



ETIC Engineering, Inc.

SITE PLAN SHOWING GROUNDWATER ANALYTICAL RESULTS, FEBRUARY AND APRIL 1999
NESTLE OAKLAND FACILITY
1310 14th STREET, OAKLAND, CALIFORNIA

Figure 15



LEGEND:

- GROUNDWATER MONITORING AND VAPOR EXTRACTION WELLS
- WELL OF UNKNOWN CONSTRUCTION
- REMEDIATION SYSTEM VACUUM PIPING

TPH-g	**Total Petroleum Hydrocarbons as gasoline**
TPH-d	**Total Petroleum Hydrocarbons as diesel**
MTBE	**Methyl t-butyl ether**
HVOCs	**Halogenated Volatile Organic Compounds**
1,1-DCA	**1,1-Dichloroethane**
1,2-DCA	**1,2-Dichloroethane**
1,1-DCE	**1,1-Dichloroethene**
cis-1,2-DCE	**cis-1,2-Dichloroethene**
1,1,2-TCA	**1,1,2-Trichloroethane**
TCE	**Trichloroethene**
ND	**Not Detected**
NA	Not Analyzed

NOTES:

1. CONCENTRATIONS IN MICROGRAMS PER LITER (ug/L)
2. FOR HVOC ANALYSES, ONLY DETECTABLE CONCENTRATIONS ARE SHOWN. NO OTHER HVOCs WERE DETECTED IN THE SAMPLES AT CONCENTRATIONS GREATER THAN METHOD DETECTION LIMITS.

ETIC Engineering, Inc.

SITE PLAN SHOWING GROUNDWATER SAMPLE ANALYTICAL RESULTS, 16 JANUARY 1997
NESTLE OAKLAND FACILITY
1310 14th STREET, OAKLAND, CALIFORNIA

Figure 16

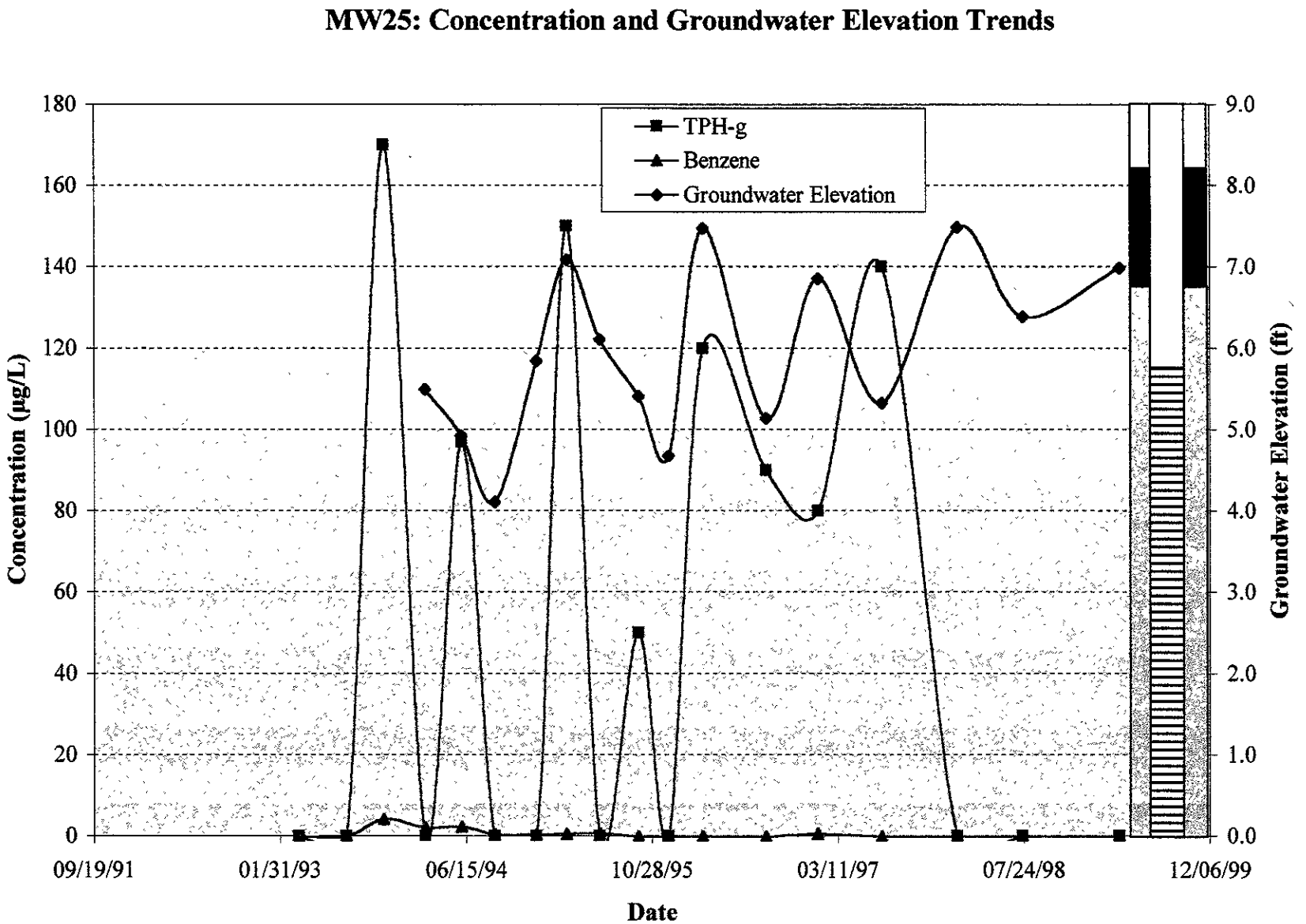

MW25: Concentration and Groundwater Elevation Trends
TPH-g
Benzene
Groundwater Elevation
Concentration (µg/L)
Groundwater Elevation (ft)
Date
180
160
140
120
100
80
60
40
20
0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
09/19/91
01/31/93
06/15/94
10/28/95
03/11/97
07/24/98
12/06/99

Figure 17a

MW26: Concentration and Groundwater Elevation Trends

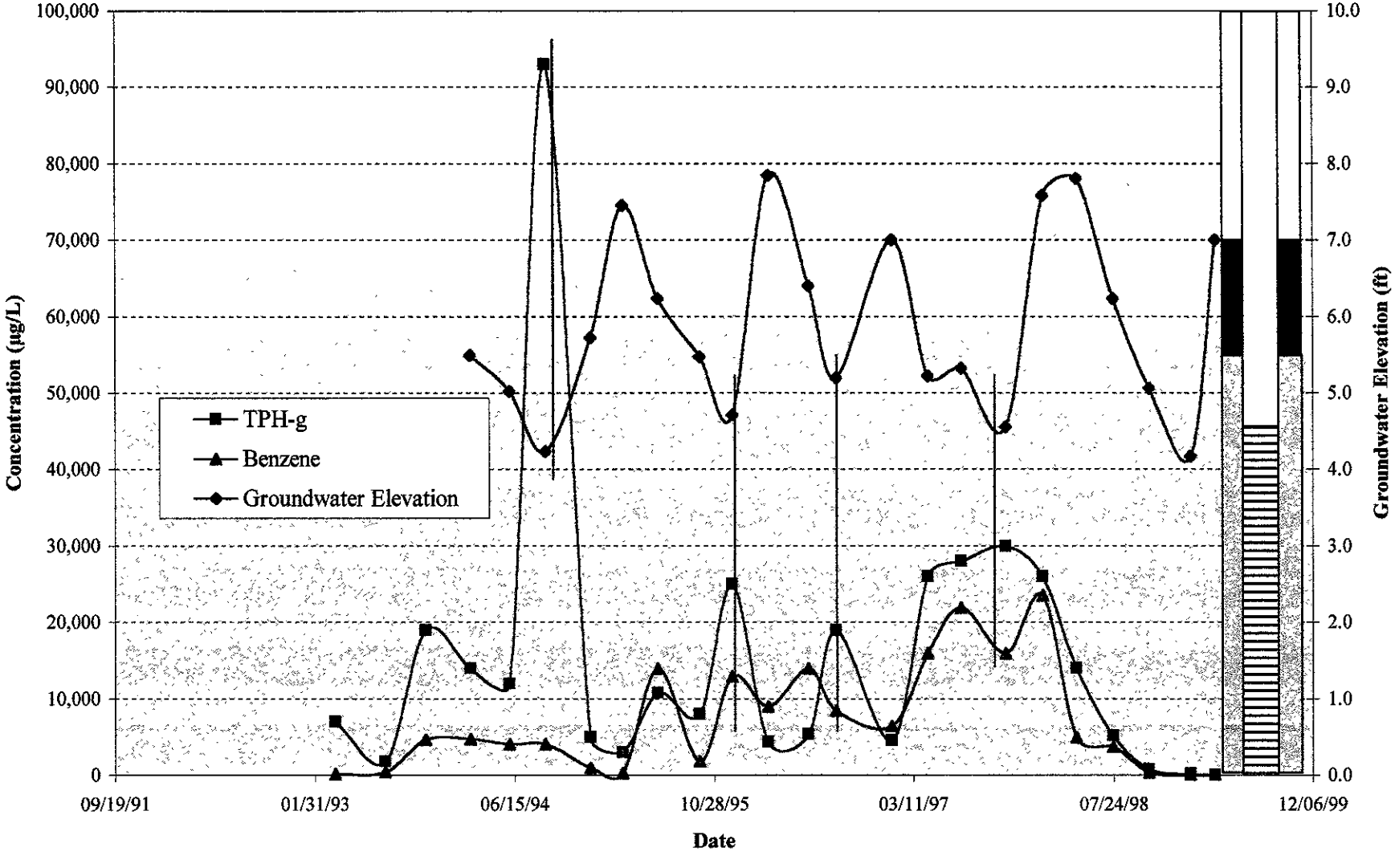


Figure 17b

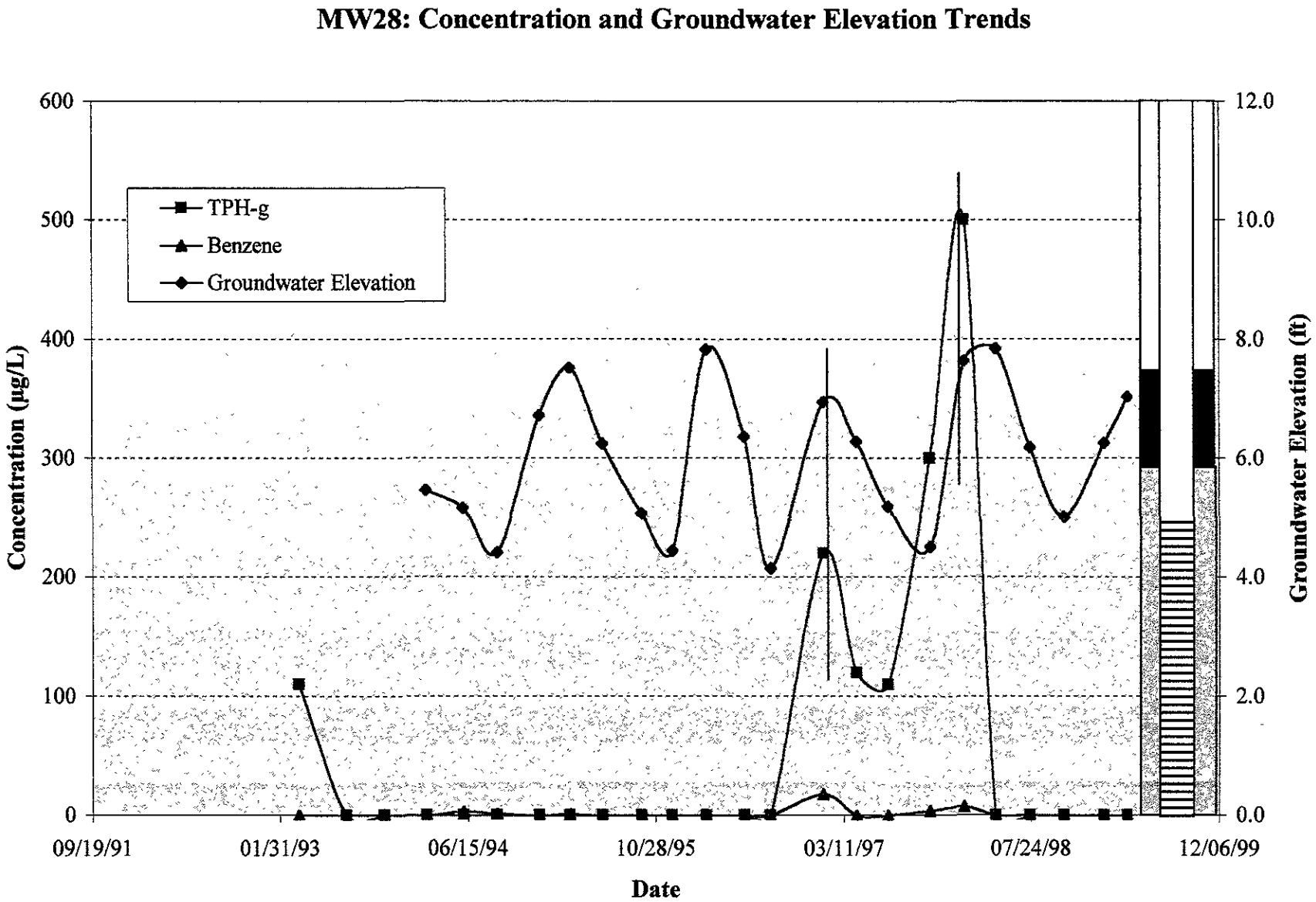

MW28: Concentration and Groundwater Elevation Trends
TPH-g
Benzene
Groundwater Elevation
Concentration (µg/L)
Groundwater Elevation (ft)
Date
600
500
400
300
200
100
0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
09/19/91
01/31/93
06/15/94
10/28/95
03/11/97
07/24/98
12/06/99

Figure 17c

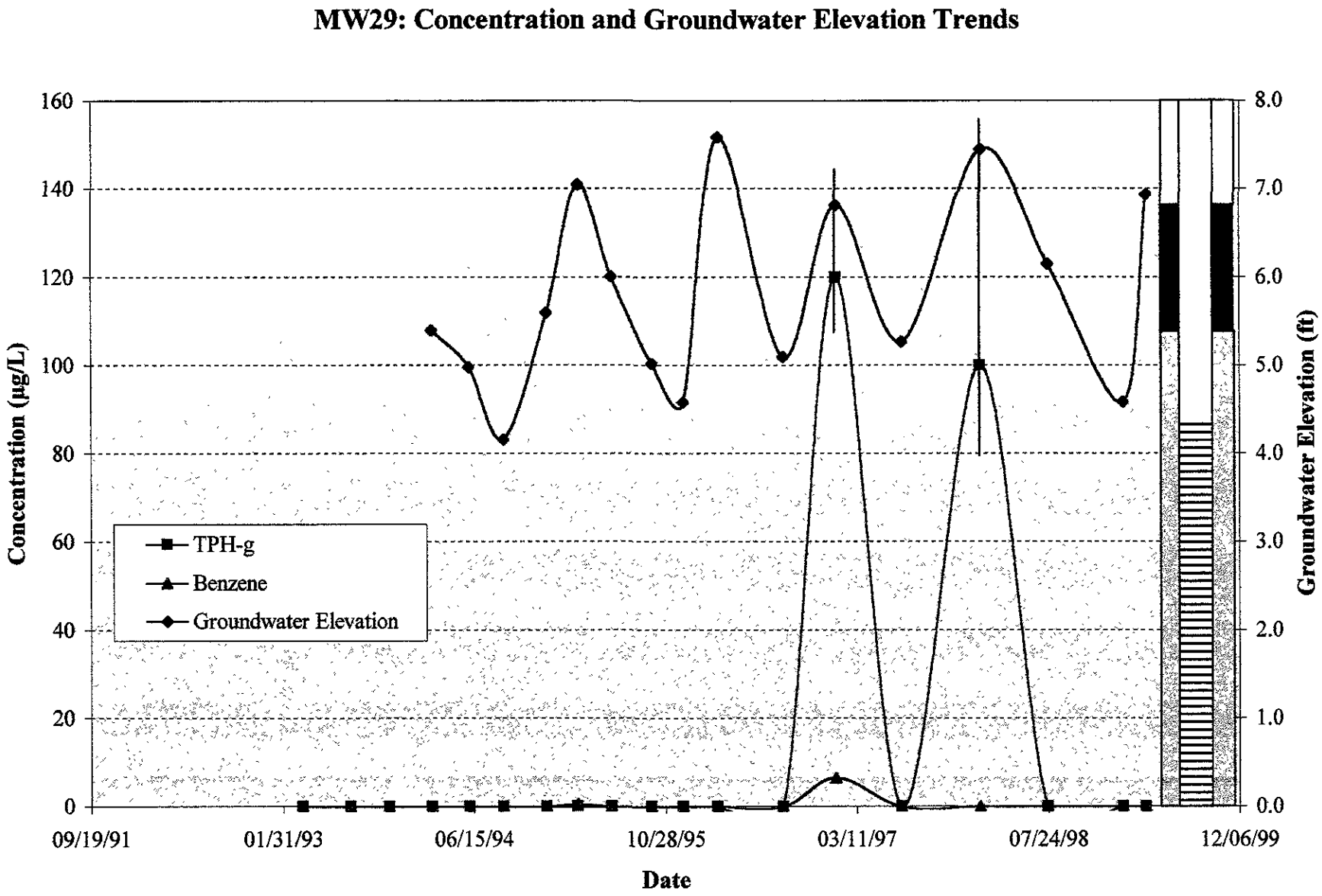

MW29: Concentration and Groundwater Elevation Trends
Concentration (µg/L)
Groundwater Elevation (ft)
Date
TPH-g
Benzene
Groundwater Elevation
160
140
120
100
80
60
40
20
0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
09/19/91
01/31/93
06/15/94
10/28/95
03/11/97
07/24/98
12/06/99

Figure 17d

LEGEND:

- GROUNDWATER MONITORING AND VAPOR EXTRACTION WELLS
- WELL OF UNKNOWN CONSTRUCTION
- MONITORED WELLS HAVING NO DETECTABLE NAPL
- WELLS CONTAINING BETWEEN 0.01–1.0 FEET OF NAPL
- WELLS CONTAINING >1.0 FEET OF NAPL

NAPL MONITORING RESULTS

TOTAL WELLS MONITORED	**65**
WELLS CONTAINING NO DETECTABLE NAPL	**49**
WELLS CONTAINING BETWEEN 0.01–1.0 FEET OF NAPL	**15**
WELLS CONTAINING >1.0 FEET OF NAPL	**1**

N

0 15 30

Scale (feet)

ETIC Engineering, Inc.

SITE PLAN SHOWING DISTRIBUTION OF NAPL, JANUARY-MAY 1999
NESTLE OAKLAND FACILITY
1310 14th STREET, OAKLAND, CALIFORNIA

Figure 18

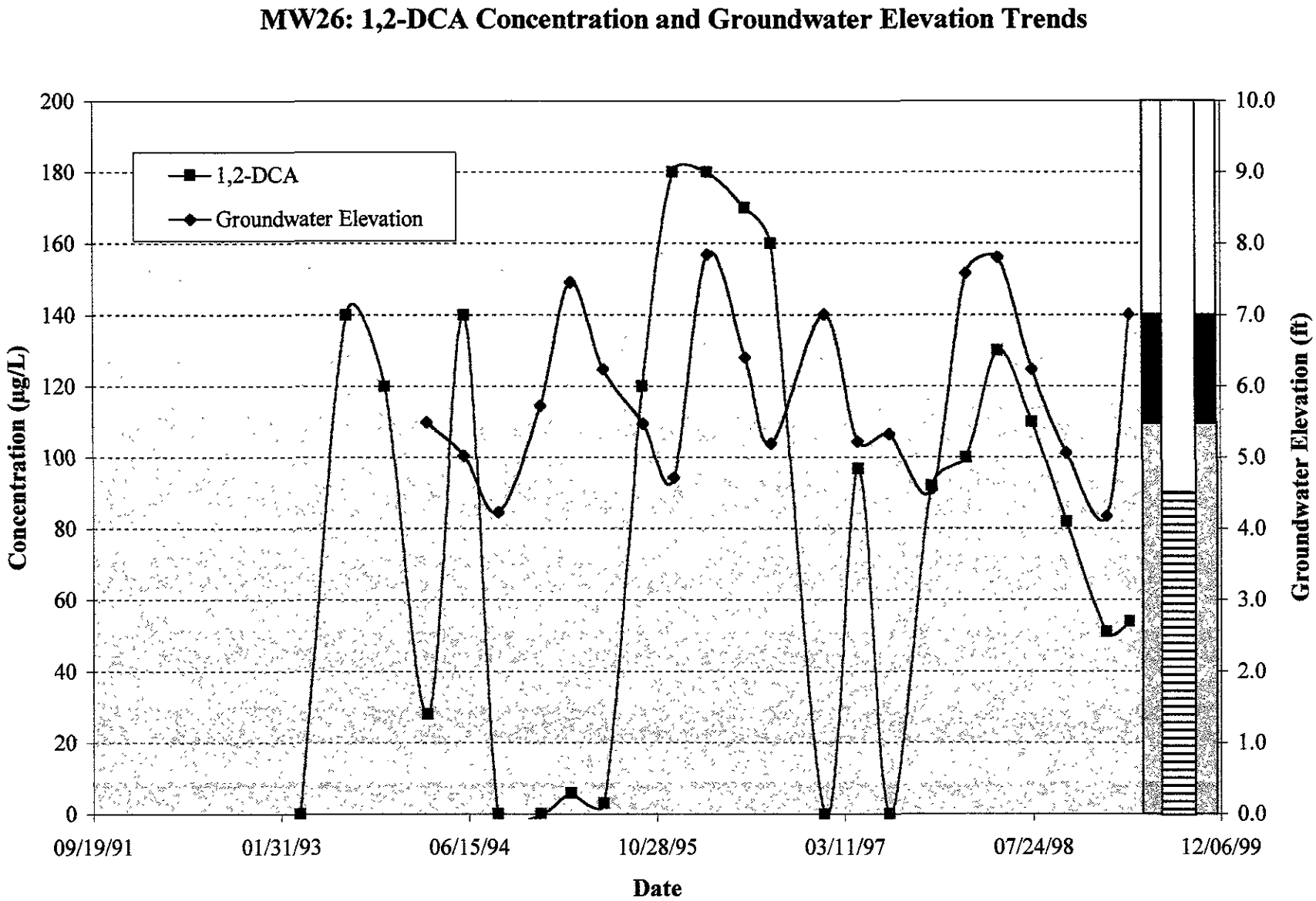

MW26: 1,2-DCA Concentration and Groundwater Elevation Trends
1,2-DCA
Groundwater Elevation
Concentration (µg/L)
Groundwater Elevation (ft)
Date
200
180
160
140
120
100
80
60
40
20
0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
09/19/91
01/31/93
06/15/94
10/28/95
03/11/97
07/24/98
12/06/99

Figure 19a

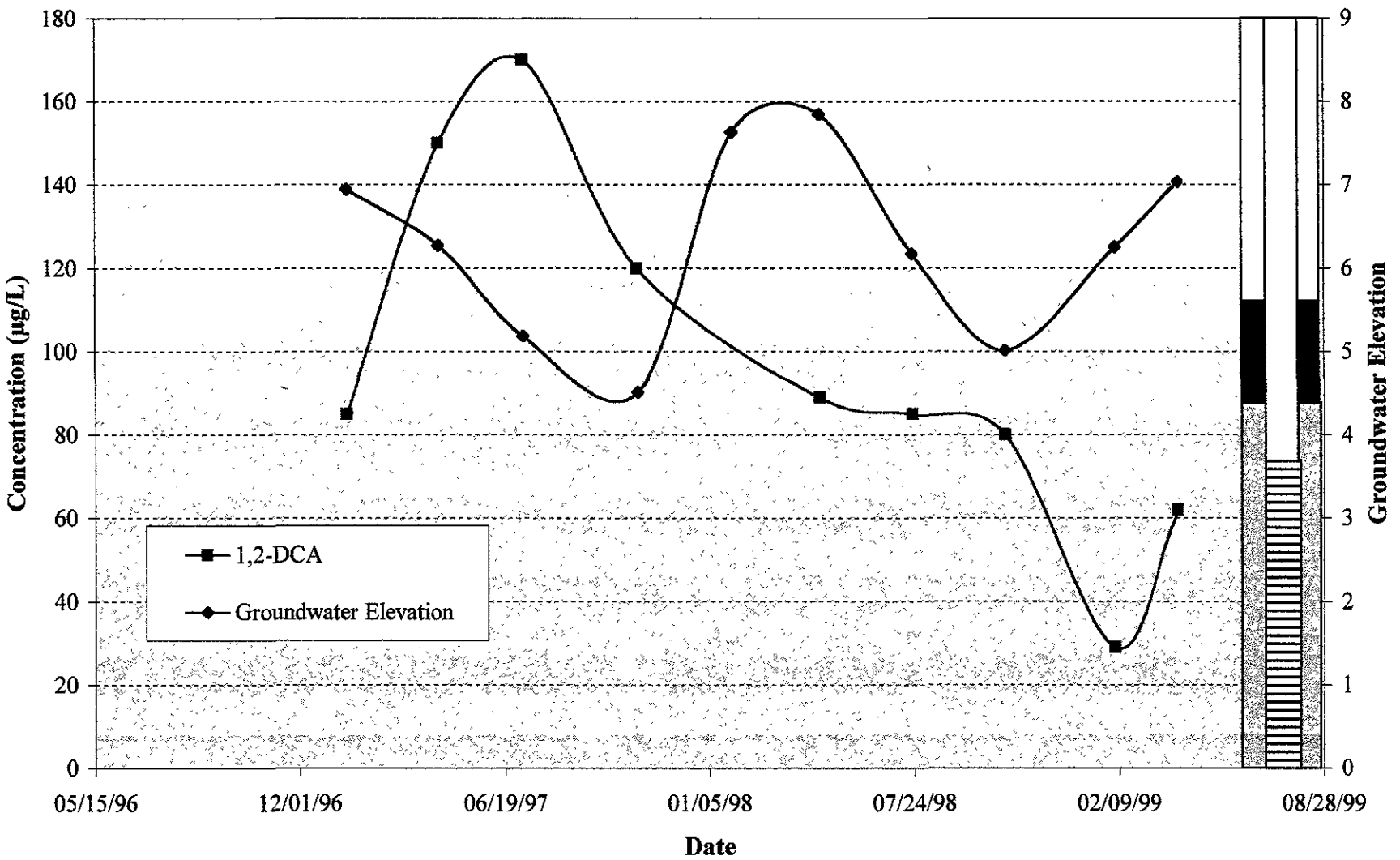

MW28: 1,2-DCA Concentration and Groundwater Elevation Trends
Concentration (µg/L)
Groundwater Elevation
Date
1,2-DCA
Groundwater Elevation
180
160
140
120
100
80
60
40
20
0
9
8
7
6
5
4
3
2
1
0
05/15/96
12/01/96
06/19/97
01/05/98
07/24/98
02/09/99
08/28/99

Figure 19b

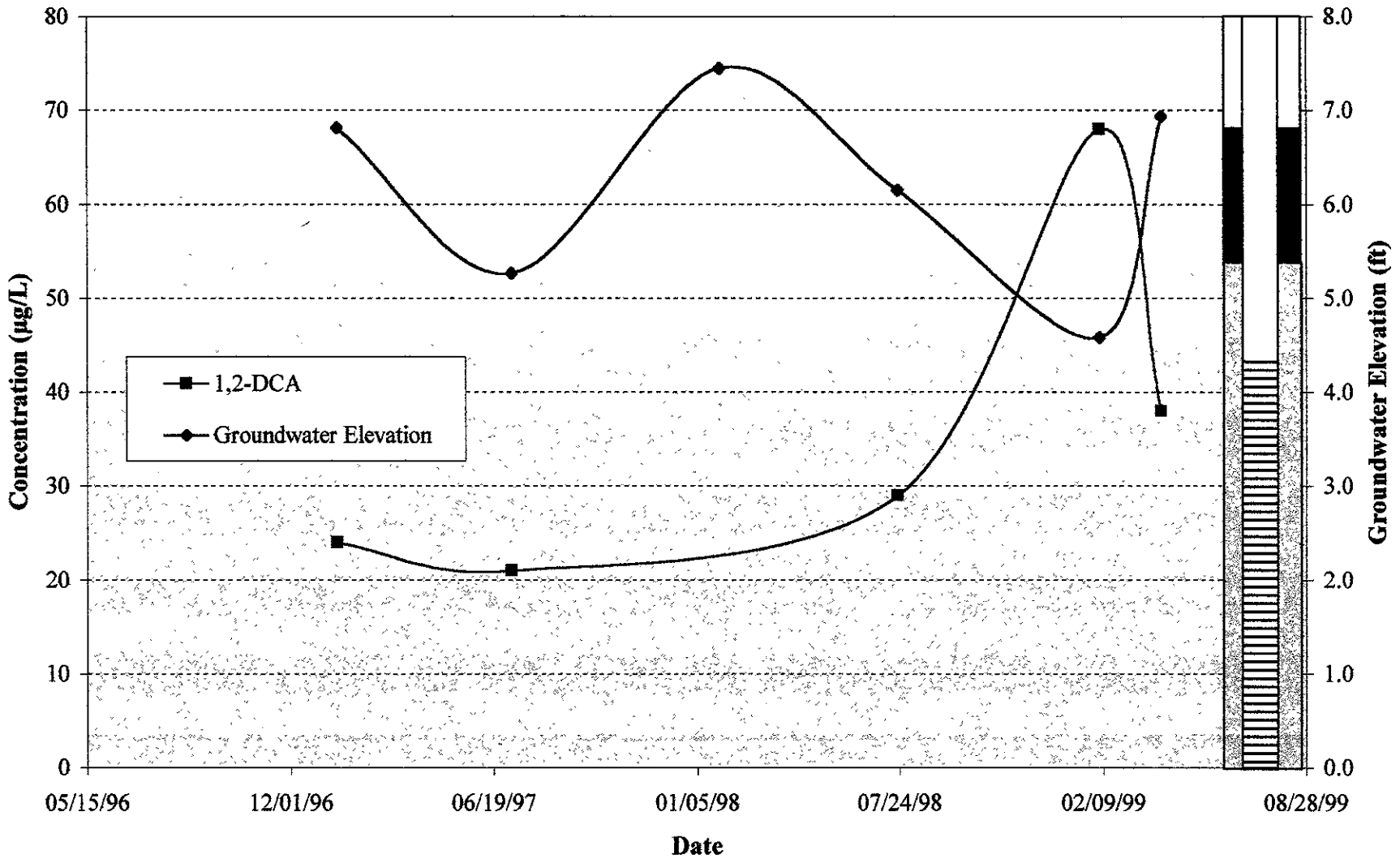
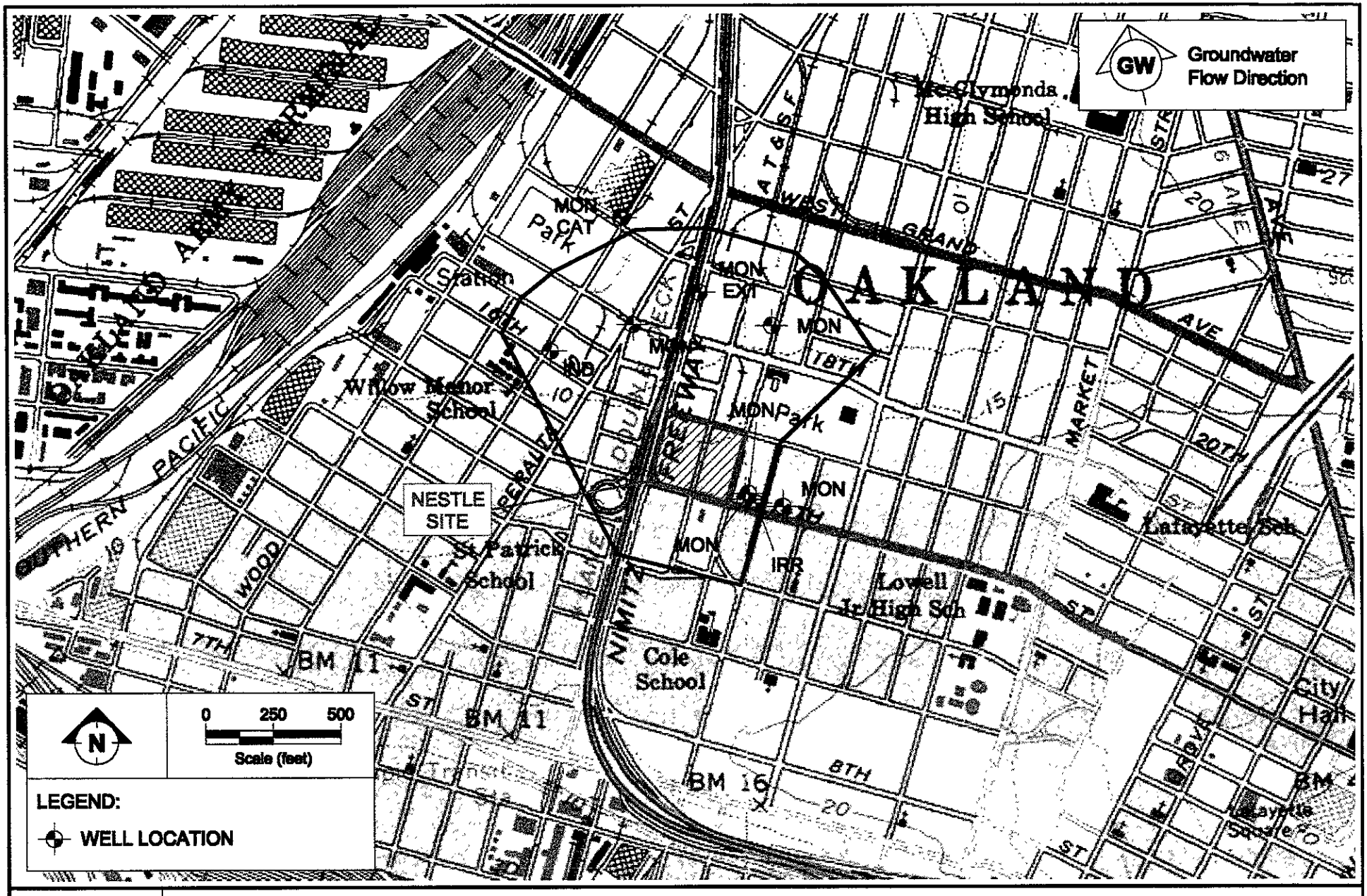

MW29: 1,2-DCA Concentration and Groundwater Elevation Trend
Concentration (µg/L)
Groundwater Elevation (ft)
Date
1,2-DCA
Groundwater Elevation
0
10
20
30
40
50
60
70
80
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
05/15/96
12/01/96
06/19/97
01/05/98
07/24/98
02/09/99
08/28/99

Figure 19c



ETIC Engineering, Inc.

WELLS IN THE VICINITY OF THE NESTLE OAKLAND FACILITY
LOCATED AT 1310 14th STREET, OAKLAND, CALIFORNIA

Figure 20

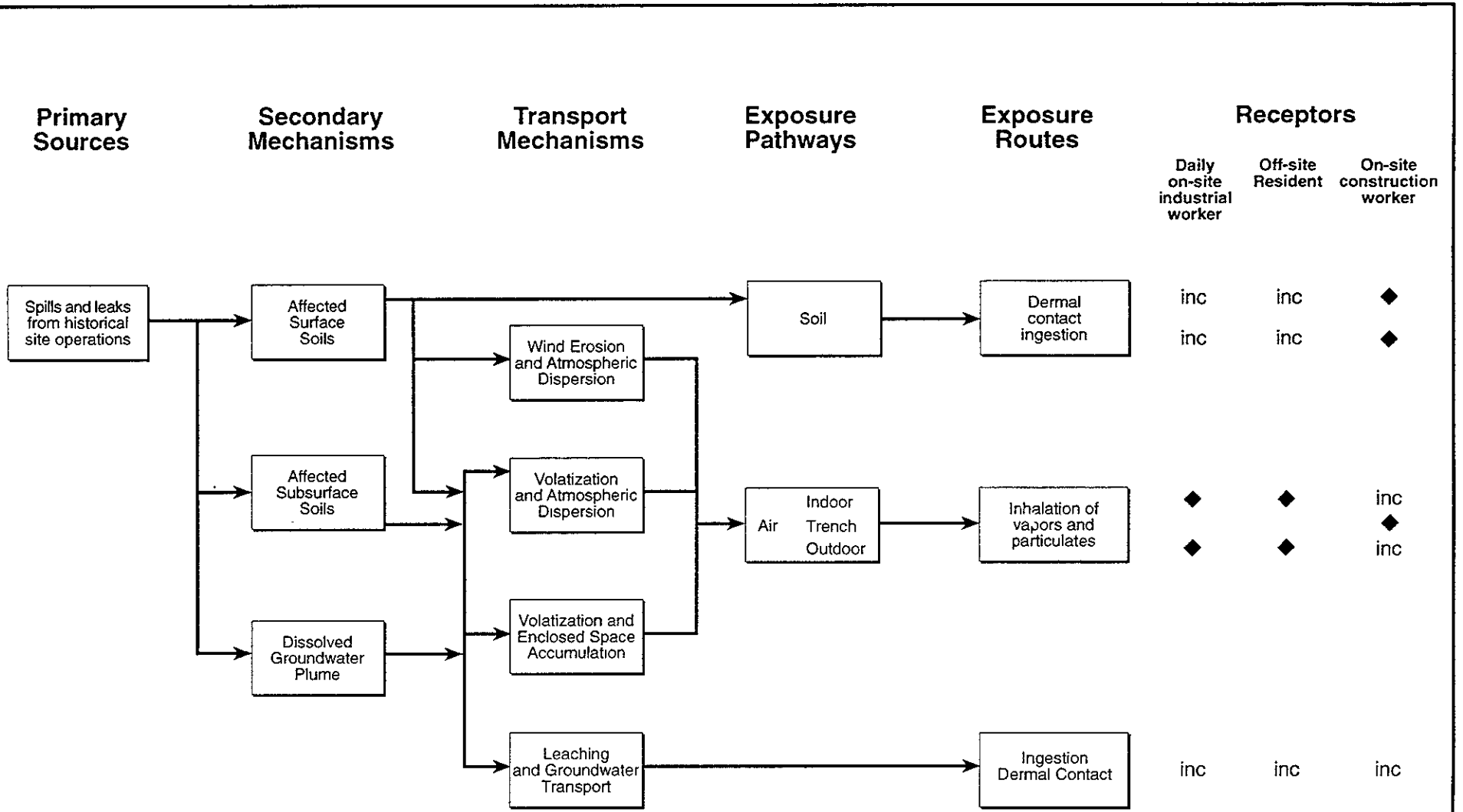
INFORMATION ON NEARBY WELLS

Nestle Oakland Facility, 1310 14th Street, Oakland, California

Location	Owner	Number of Wells	Type of Wells	Depth of Wells (feet)	Distance from Nestle (miles)	Comments
1267 West 14th Street	Nabisco	4	Monitoring	22-30	0.13	4-11/90 drill date; Upgradient
1340 Cypress	Coca-Cola	10	9 Monitoring 1 Extraction	25-30	0.20	3-6/91 drill date; Downgradient
1700 20th Street	Anheuser-Busch Co.	3	Monitoring	30	0.31	9/87 drill date; Downgradient
1614 Campbell	General Electric	1	Industrial	200	0.22	Crossgradient
1800 Peralta	Architectural Emp.	2	Monitoring	10-18	0.18	6/88 drill date; Downgradient
Union at 14th Street	Shredded Wheat	1	Irrigation	55	0.15	Upgradient
1901 Poplar	Pacific Pipe Co.	3	Monitoring	24	0.20	3/94 drill date; Crossgradient
1266 14th Street	Comm. Air.	1	Monitoring	25	0.13	6/96 drill date; Upgradient
1230 14th Street	Sabek Shell	4	1 Boring (Sabek) 3 Monitoring (Shell)	0 (Sabek) 22-23 (Shell)	0.17	7/90 drill date (Sabek), 3/96 drill date (Shell); Upgradient
20th at Campbell	PG&E	1	Cathodic	120	0.31	7/74 drill date; Downgradient

Source: County of Alameda Public Works Agency Well Inventory File, November 1997.

Figure 21



LEGEND

inc Incomplete pathway

◆ Complete pathway

Site Conceptual Model
Nestle Oakland Facility, Oakland, California

Figure No.

Date: April 1999

Figure 22a

Table aaa
RBCA Tier I Results

Chemical	Representative Source Concentration* (mg/l)	Tier I RBSLs (mg/l) Groundwater Volatilization to Indoor Air		Tier I RBSLs (mg/l) Groundwater Volatilization to Ambient Air	
		On-Site Industrial Receptor	Off-site Residential Receptor	On-Site Industrial Receptor	Off-site Residential Receptor
benzene	23.6	**0.021**	0.007	**5.22**	3.2
chloroethane	8.00E-03	1.50E+03	580	>sol	>sol
1,1-DCA	5.20E-02	55	21	>sol	>sol
1,2-DCA	1.80E-01	**6.90E-02**	**2.20E-02**	13	7.5
cis-1,2-DCE	8.00E-04	>sol	>sol	>sol	>sol
ethylbenzene	1.6	>sol	77	>sol	>sol
MTBE	9.50E-02	3.70E+03	1.40E+03	>sol	>sol
methylene chloride	2.60E-03	1.8	0.57	400	240
toluene	18	85	33	>sol	>sol
1,1,2-TCA	8.40E-03	2.1	6.80E-01	310	180
TCE	2.40E-03	1.40E-01	4.60E-02	22	13
xylenes	6.5	>sol	>sol	>sol	>sol

Target Risk Level: 1x10-6 for Class A and B Carcinogens, 1x10-5 for Class C Carcinogens
Target Hazard: 1.0
RBSL: Tier I risk-based screening level
*: Concentrations represents historical site maximum values detected in groundwater
Bolded parameters indicate chemicals and exposure pathways exceeding Tier I RBSLs
>sol: indicates risk-based screening level is greater than constituent solubility

Figure 22b

Table bbb
Key RBCA Tier II Input Data

Parameter	Value	Comment
Vadose zone thickness	5 ft	Back-calculated from capillary fringe thickness and depth to groundwater
Capillary fringe thickness	2 ft	Literature value based on observed presence of mixed sediments (Todd, 1980; Spence and Gomez, 1997)
Depth to groundwater	7 ft	Site-specific Value
Soil porosity	0.4	Literature value based on observed presence of mixed sediments (Heath, 1989; Freeze and Cherry, 1979, Spence and Gomez, 1997)
Vadose zone water content	0.25	Based on Spence and Gomez, 1997
Vadose zone air content	0.15	Based on Spence and Gomez, 1997
Capillary fringe water content	0.38	Based on Spence and Gomez, 1997
Capillary fringe air content	0.02	Based on Spence and Gomez, 1997
Foundation crack fraction	0.001	Based on Spence and Gomez, 1997
Building air exchange rate	0.00028/s	Based on Spence and Gomez, 1997
Target carcinogenic risk level (industrial land use)	1x10-5	Based on USEPA 1990; BAAQMD, 1996; ENVIRON, 1998

Figure 22c

Table ccc
RBCA Tier II Results

Receptor: On-site Industrial Worker

		Inhalation of Volatiles from Groundwater			
		Indoor Air	Indoor Air	Ambient Air	Ambient Air
Chemical	Representative Source Concentration (ug/l)	Carcinogenic Risk	Noncarcinogenic Hazard	Carcinogenic Risk	Noncarcinogenic Hazard
Benzene	4810*	4.60E-06	7.70E-02	2.70E-08	8.90E-04
1,2-DCA	22**	5.90E-09	6.40E-05	1.70E-10	1.90E-06
Total Pathway Risk/Hazard:		**4.61E-06**	**7.71E-02**	**2.72E-08**	**8.92E-04**

* Concentration represents 95% UCL of mean in wells MW-3, MW-26, and MW-28
**Concentration represents 95% UCL of mean in wells MW-26 and MW-28
Target Risk Level: 1x10-5 for all carcinogens
Target Hazard: 1.0

Receptor: Off-site Resident

		Inhalation of Volatiles from Groundwater			
		Indoor Air	Indoor Air	Ambient Air	Ambient Air
Chemical	Representative Source Concentration (ug/l)	Carcinogenic Risk	Noncarcinogenic Hazard	Carcinogenic Risk	Noncarcinogenic Hazard
Benzene	18***	3.30E-08	4.50E-04	3.40E-10	4.60E-06
1,2-DCA	170***	8.50E-08	7.80E-04	2.30E-09	2.00E-05
Total Pathway Risk/Hazard:		**1.18E-07**	**1.23E-03**	**2.64E-09**	**2.46E-05**

***Concentration represents historical maximum value detected in off-site well MW-28
Target Risk Level: 1x10-6 for all carcinogens
Target Hazard: 1.0

Figure 22d