

Mr. Lee Douglas  
Douglas Parking Company  
1721 Webster Street  
Oakland, California 94612

Ms. Barbara Jakub  
Alameda County Environmental Health  
Department of Environmental Health  
1131 Harbor Bay Parkway, 2<sup>nd</sup> Floor  
Alameda, CA 94502-6577

**RECEIVED**

**3:42 pm, Mar 29, 2012**

Alameda County  
Environmental Health

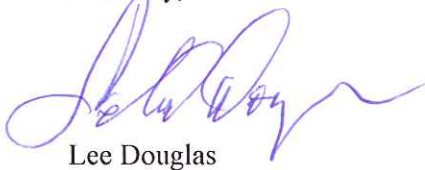
**Re: Douglas Parking Company**  
1721 Webster Street  
Oakland, California  
ACEH File No. 129

Dear Ms. Jakub:

I, Mr. Lee Douglas, have retained Pangea Environmental Services, Inc. (Pangea) as the environmental consultant for the project referenced above. Pangea is submitting the attached report on my behalf.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

Sincerely,



Lee Douglas



March 26, 2012

***VIA ALAMEDA COUNTY FTP SITE***

Ms. Barbara Jakub  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, 2<sup>nd</sup> Floor  
Alameda, California 94502

Re: **Sensitive Receptor Survey, Conduit Study and Site Conceptual Model**  
Douglas Parking Company  
1721 Webster Street  
Oakland, California 94612  
ACEH File No. 129

Dear Ms. Jakub:

On behalf of the Douglas Parking Company, Pangea Environmental Services, Inc. (Pangea) has prepared this *Sensitive Receptor Survey, Conduit Study and Site Conceptual Model* for the subject site. This report was requested by your agency letter dated June 17, 2011 and includes the requested geologic cross-sections. This report also identified data gaps and offers conclusions and recommendations for site corrective action.

If you have any questions regarding this report, please call me at (510) 435-8664.

Sincerely,  
**Pangea Environmental Services, Inc.**

A handwritten signature in blue ink, appearing to read "Bob Clark-Riddell", is written over the printed name.

Bob Clark-Riddell, P.E.  
Principal Engineer

Attachment: *Sensitive Receptor Survey, Conduit Study and Site Conceptual Model*

cc: Mr. Lee Douglas, Douglas Parking Company, 1721 Webster Street, Oakland, California 94612  
SWRCB Geotracker (electronic copy)

**PANGEA Environmental Services, Inc.**

1710 Franklin Street, Suite 200, Oakland, CA 94612 Telephone 510.836.3700 Facsimile 510.836.3709 [www.pangeaenv.com](http://www.pangeaenv.com)



**SENSITIVE RECEPTOR SURVEY, CONDUIT STUDY  
AND SITE CONCEPTUAL MODEL**

**Douglas Parking Company  
1721 Webster Street  
Oakland, California  
ACEH File No. 4070**

**March 26, 2012**

*Prepared for:*

Mr. Lee Douglas  
1721 Webster Street  
Oakland, California 94612

*Prepared by:*

Pangea Environmental Services, Inc.  
1710 Franklin Street, Suite 200  
Oakland, California 94612

*Written by:*



Tina de la Fuente  
Staff Scientist

Bob Clark-Riddell, P.E.  
Principal Engineer

**PANGEA Environmental Services, Inc.**

**SENSITIVE RECEPTOR SURVEY, CONDUIT STUDY  
AND SITE CONCEPTUAL MODEL**

**1721 Webster Street  
Oakland, California  
ACEH File No. 4070**

**TABLE OF CONTENTS**

<b>1.0 INTRODUCTION.....</b>	<b>1</b>
1.1 SITE DESCRIPTION .....	1
1.2 NEARBY SITES.....	1
1.3 GEOLOGY AND HYDROGEOLOGY .....	2
1.3.1 Regional Geology.....	2
1.3.2 Local Geology and Hydrogeology .....	2
1.3.3 Groundwater Flow.....	2
1.3.4 Surface Water.....	2
1.4 GROUNDWATER BENEFICIAL USE.....	2
<b>2.0 CONTAMINANT RELEASE AND ENVIRONMENTAL WORK.....</b>	<b>3</b>
2.1 SOURCE/RELEASE INFORMATION.....	3
2.2 CHEMICALS OF CONCERN .....	3
2.3 PREVIOUS ENVIRONMENTAL WORK .....	3
2.3.1 Work Initiation.....	3
2.3.2 Soil and Groundwater Investigation Activities .....	3
2.3.3 Remedial Activities.....	4
<b>3.0 CHARACTERIZATION OF CONTAMINANT EXTENT AND STABILITY .....</b>	<b>5</b>
3.1 FREE PRODUCT.....	5
3.2 SOIL CONTAMINATION.....	5
3.3 GROUNDWATER CONTAMINATION.....	5
<b>4.0 SENSITIVE RECEPTOR SURVEY AND CONDUIT STUDY.....</b>	<b>6</b>
4.1 SENSITIVE RECEPTOR SURVEY .....	6
4.1.1 Well Documentation Review .....	6
4.1.2 Surface Water Bodies.....	7
4.1.3 Land Use.....	7
4.2 PREFERENTIAL PATHWAY EVALUATION (CONDUIT STUDY) .....	7
<b>5.0 SCM SUMMARY .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
5.1 SCM OVERVIEW .....	8
5.2 DATA GAPS .....	9
<b>6.0 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>REFERENCES .....</b>	<b>10</b>

## FIGURES

Figure 1.....	Site Location Map
Figure 2.....	Cross Section Location Map
Figure 3.....	Groundwater Elevation Contour and Hydrocarbon Concentration Map
Figure 4.....	Extent of TPHg in Soil
Figure 5.....	Extent of TPHg in Groundwater with Historic Grab Sample Results
Figure 6.....	Extent of Benzene in Groundwater with Historic Grab Sample Results
Figure 7.....	Current Extent of TPHg in Groundwater (Well Data Only)
Figure 8.....	Current Extent of Benzene in Groundwater (Well Data Only)
Figure 9.....	Cross Section A-A' Showing Estimated Extent of TPHg & Benzene in Soil
Figure 10.....	Cross Section A-A' Showing Estimated Extent of TPHg & Benzene in GW
Figure 11.....	Cross Section B-B' Showing Estimated Extent of TPHg & Benzene in Soil
Figure 12.....	Cross Section B-B' Showing Estimated Extent of TPHg & Benzene in GW
Figure 13.....	Well Location Map
Figure 14.....	Subsurface Utility Map
Figure 15.....	TPHg and Benzene Concentration Trends in Groundwater
Figure 16.....	TPHg and Benzene Concentrations vs. Groundwater Elevation
Figure 17.....	TPHg Concentrations vs. Distance From Source

## TABLES

Table 1.....	Soil Analytical Data
Table 2.....	Groundwater Analytical Data
Table 3.....	SVE/AS System Performance Summary

## APPENDICES

Appendix A.....	Regulatory Letter
Appendix B.....	Boring Logs & Well Construction Details
Appendix C.....	Subsurface Utility Maps

# **SENSITIVE RECEPTOR SURVEY, CONDUIT STUDY AND SITE CONCEPTUAL MODEL**

**1721 Webster Street  
Oakland, California  
ACEH File No. 4070**

**March 26, 2012**

## **1.0 INTRODUCTION**

Pangea Environmental Services, Inc. (Pangea) has prepared this *Sensitive Receptor Survey, Conduit Study and Site Conceptual Model (SCM)* for the subject site. This report includes geologic cross-sections, a sensitive receptor survey, and a conduit study as requested in your agency letter dated June 17, 2011 (Appendix A). This SCM describes site conditions based on available data, summarizes important site issues, and provides a guide for future assessment and/or remediation.

### **1.1 Site Description**

The site is currently being utilized as a parking garage, and is located between 17th and 19th Streets in uptown Oakland, California, approximately four miles east of San Francisco Bay and one quarter of a mile west of Lake Merritt (Figure 1). The site is relatively flat with an elevation of approximately 30 feet (ft) above mean sea level (msl). The site formerly contained one 1,000-gallon and two 500-gallon gasoline underground storage tanks (USTs) and piping and dispensers.

### **1.2 Nearby Sites**

Several former underground storage tank (UST) sites are located close to the site, including Prentiss Properties to the northeast at 1750 Webster Street, a former gas station to the east at 1700 Webster, and a former Chevron service station which is located approximately 450 feet to the southwest on the corner of 17<sup>th</sup> Street and Harrison Street. There are also several closed leaking underground storage tank (LUST) sites within a 1,000 foot radius of the site.

### **1.3 Geology and Hydrogeology**

#### **1.3.1 Regional Geology**

The site is situated in the Coast Range Physiographic Province, which is an area characterized by northwest-southeast running valleys and ridges. Geologic formations of the San Francisco Bay Region range from the Jurassic Period to the Holocene epoch (end of the Pleistocene era).

Tectonic activity during the Plio-Pleistocene era formed a structural depression (San Francisco Bay) through subsidence and uplift along the San Andreas, Hayward and Calaveras fault zones. The Bay filled with alluvial deposits of gravel, sand, silt and clay from the surrounding highlands and sea level fluctuation deposited bay muds all around San Francisco Bay (Radbruch, 1957). The alluvial deposits generally become finer closer to the Bay, where they interbed with predominately fine-grain sediment deposited by the Bay.

#### **1.3.2 Local Geology and Hydrogeology**

Unconfined groundwater conditions exist at the site. A shallow water-bearing zone consisting of highly permeable sand is present from approximately 14 to 30 feet bgs, and is underlain by a silty clay layer. Since 1994, the depth to groundwater beneath and surrounding the site has ranged from approximately 13.6 feet bgs (MW-5) to 23.4 feet bgs (MW-7), equivalent to a groundwater elevation range from 5 to 13 feet above msl over thirteen years of monitoring. Rainfall in this area occurs primarily between November and March and the average rainfall is approximately 23 inches per year.

#### **1.3.3 Groundwater Flow**

Groundwater elevation data indicates that the groundwater beneath the site generally flows *northwards* to *northeastwards*, consistent with the local topography. The recent groundwater flow direction is shown on Figure 3. The *northwards* to *northeastwards* flow direction is generally consistent with the inferred groundwater flow directions at the nearby LUST site at 1633 Harrison Street.

#### **1.3.4 Surface Water**

The closest surface water to the site is Lake Merritt, which is located approximately 1,295 feet (approximately ¼ mile) east-northeast of the site.

### **1.4 Groundwater Beneficial Use**

According to the Basin Plan from the California Regional Water Quality Control Board (RWQCB), the site lies near the northern end of the East Bay Plain Subbasin of the Santa Clara Valley Basin. The *existing* beneficial uses for this basin include (1) municipal and domestic water supply, (2) industrial process water supply, (3) industrial service water supply and (4) agricultural water supply.

## **2.0 CONTAMINANT RELEASE AND ENVIRONMENTAL WORK**

### **2.1 Source/Release Information**

On August 3 and 6, 1992, Parker Environmental Services removed one 1,000-gallon and two 500-gallon gasoline underground storage tanks (USTs) from the site. Up to 1,500 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) and up to 12 mg/kg benzene were detected in the soil samples collected from the UST excavation (Parker, 1992).

### **2.2 Chemicals of Concern**

The chemicals of concern (COC) in site soil and groundwater are the following petroleum hydrocarbons: TPHg; benzene, toluene, ethylbenzene, and xylenes (BTEX).

### **2.3 Previous Environmental Work**

Previous environmental work is summarized below.

#### **2.3.1 Work Initiation**

An unauthorized release was reported on January 7, 1993, which is the same day the RWQCB and ACEH opened this case (#01-0151 and RO#4070, respectively).

#### **2.3.2 Soil and Groundwater Investigation Activities**

Several investigations have been completed at the site. On July 8 and September 8, 1994, Gen Tech/Piers Environmental, Inc. (Gen Tech) of San Jose, California drilled six exploratory borings and installed three groundwater monitoring wells (MW-1 through MW-3). Gen Tech reported the investigation work in its *Soil and Groundwater Investigation and Quarterly Monitoring Report* dated December 2, 1994.

In February and May 1996, Cambria Environmental Technology (Cambria) of Emeryville, California advanced seven geoprobe soil borings and installed two groundwater monitoring wells (MW-4 and MW-5), which was reported in the *Subsurface Investigation Report* dated July 16, 1996. On August 8, 2000, *Conduit Study and File Review Report* was submitted by Cambria Environmental Technology. The report provided significant information about offsite hydrocarbon impact and offsite sources, and concluded that there were no identified conduits for contaminant migration in groundwater. On June 27, 2003 Cambria installed two additional offsite monitoring wells (MW-6 and MW-7) to facilitate additional plume delineation.

Pangea began periodic groundwater monitoring at the site in July 2006. Historical sampling locations are shown on Figure 2 and analytical results are presented in Tables 1 and 2.



### 2.3.3 Remedial Activities

Several remedial techniques have been utilized at the subject site. In January 1998, Cambria installed ORC socks in well MW-2 to enhance the natural attenuation of dissolved-phase hydrocarbons. Dissolved oxygen (DO) concentrations temporarily increased in well MW-2 following the ORC sock installation. In February and March 1999, a total of 120 gallons of 7.5% hydrogen peroxide solution was added into monitoring wells MW-2 and MW-3 to oxidize hydrocarbons and also increase DO levels to enhance biodegradation of dissolved-phase hydrocarbons. While hydrogen peroxide *temporarily* increased groundwater DO levels, hydrocarbon concentrations fluctuated (even increased) before returning to pre-remediation levels.

On March 4, 2003, Cambria installed a co-axial air sparging/soil vapor extraction well (SV-1/AS-1) and two angled air sparging wells (AS-2 and AS-3) to approximately 30 ft bgs. The wells were installed to facilitate feasibility testing and future site remediation. The SVE system ran from October 2007 to November 2010 and the AS system operated from November 2007 to April 2010. The soil vapor extraction (SVE) remediation system consisted of a blower that extracts soil vapor from well SVE-1. Extracted vapors were routed through a moisture separator then treated by two 2,000-lb canisters of granular activated carbon plumbed in series. The treated vapor was discharged to the atmosphere in accordance with Bay Area Air Quality Management District (BAAQMD) requirements. The air sparging (AS) system consisted of a compressor for injecting air into wells AS-1, AS-2 and/or AS-3. Injection into AS wells was controlled by timer-activated solenoid valves. Wells SVE-1 and AS-1 are constructed as vertical co-axial wells, with angled wells AS-2 and AS-3 located in the same vault.

On August 8, 2008, air sparge wells AS-1 and AS-3 were disconnected from the air compressor and air sparging was conducted solely in well AS-2 to target hydrocarbons in nearby well MW-2. As of October 26, 2010, the SVE system operated for a total of about 19,396 hours (approximately 808 days). As of October 26, 2010, laboratory analytical data indicates that the system removed a total of approximately 3,212 lbs TPHg and 6.88 lbs benzene. The SVE system was restarted and subsequently shutdown on November 23, 2010 due to low removal rates. The AS compressor needs repair to continue air injection to stimulate hydrocarbon biodegradation.

On March 5, 2009, Pangea submitted an *Investigation and Remediation Workplan* which proposed additional investigation and expansion of the existing remediation system to improve removal rates. SVE performance data is summarized in Table 3. Additional approaches to enhance site remediation were also presented within groundwater monitoring reports.

### 3.0 CHARACTERIZATION OF CONTAMINANT EXTENT AND STABILITY

Site investigation work has shown the presence of petroleum hydrocarbons in onsite and offsite soil and groundwater. There are currently ten (10) groundwater monitoring/remediation wells at the site, all screened from the approximately 10 to 30 feet bgs, and three air sparge wells providing characterization of deeper groundwater (approximately 27 to 30 ft bgs). Boring and well locations are shown on Figure 2. Boring logs and well construction details are presented in Appendix B.

#### 3.1 Free Product

No free product has been encountered in any site monitoring wells, but a sheen was noted historically by the laboratory in several grab groundwater samples collected from site borings. Based on results from site borings and monitoring wells it appears that no significant quantities of free product are currently present at the site.

#### 3.2 Soil Contamination

Figure 4 shows TPHg and benzene concentrations in soil in plan view. Figures 9 and 11 show the extent of TPHg contamination in soil on cross sections A-A' and B-B', respectively. Elevated contaminant concentrations were detected in source area soil near the former USTs, and east and northeast of the USTs at depths of approximately 20 and 20.5 ft bgs in predominately sandy soil. Soil contamination appears to be well defined, except downgradient of well MW-2.

#### 3.3 Groundwater Contamination

The historical and current *lateral* extent of hydrocarbons is illustrated on Figures 5 through 8. The downgradient extent of TPHg and benzene contamination in groundwater is fairly well defined by monitoring well MW-5. Contaminant concentrations are generally highest in source wells MW-2 and MW-3, which are both located near the former USTs, and in offsite wells MW-4 and MW-6 located down/crossgradient from the source area. Hydrocarbons in wells MW-4 and MW-6 located across the street may be from an offsite source. Groundwater analytical data indicates that the contaminant plume is stable.

The *vertical* extent of contaminants is illustrated on Figures 10 and 12, a cross-sectional representation of onsite and offsite conditions. The maximum explored depth at the site is approximately 30 ft bgs. There is a layer of clay at approximately 30 ft bgs near the former USTs. This clay layer may be preventing contaminants from migrating into deeper water-bearing zones. Groundwater analytical data from the deeper site wells (air sparge wells) suggests that hydrocarbons are mostly limited to shallower groundwater.

## **4.0 SENSITIVE RECEPTOR SURVEY AND CONDUIT STUDY**

The following media contain contaminant concentrations that exceed the RWQCB ESLs protective of commercial site use: onsite soil and groundwater. The potential exposure pathways for public health and the environment with respect to residual contaminants are discussed below. As described herein, the primary potential exposure pathway appears to be vapor intrusion into onsite and nearby buildings.

### **4.1 Sensitive Receptor Survey**

As required by ACEH, Pangea performed a sensitive receptor survey that included a search for all domestic or municipal wells within ¼ mile radius of the site and identification of the nearest surface water bodies and land usage near the site. The purpose of the sensitive receptor survey was to help determine if site contamination poses risks to human health and the environment.

#### **4.1.1 Well Documentation Review**

Based on our review of well information provided by the Department of Water Resources (DWR) and Alameda County Public Works Agency (ACPWA), Pangea identified several permitted wells within approximately a ¼ mile radius of the site. Permitted domestic well information provided by the DWR and ACPWA is considered confidential and is not disclosed herein. Two locations are listed as irrigation wells and are shown as locations 6 and 7 on Figure 13. Location 6 is listed as having 10 irrigation wells with total depths of approximately 280 ft bgs and is situated approximately 1,360 ft northeast (downgradient) of the site. Location 7 is listed as having 6 irrigation wells with total depths of approximately 95 ft bgs and is situated approximately 1,080 ft east (crossgradient) of the site.

Pangea identified thirteen additional permitted well locations within the ¼ mile radius search of the site using DWR/ACPWA information. Seven of the thirteen locations were listed as groundwater monitoring wells: locations 1, 2, 3, 5, 8, 9 and 16. Locations 4 and 11 through 15 were listed as test wells for the City of Oakland Redevelopment Agency, which may have been destroyed during redevelopment of the area. The approximate well locations of all identified wells are also shown on Figure 13.

Pangea also reviewed the State Water Resources Control Board (SWRCB) GeoTracker database for nearby wells. Three well locations were identified on Geotracker within a ¼ mile of the site. Locations 2 and 9 were previously identified by the DWR/ACPWA documentation review as monitoring wells associated with 1633 Harrison Street and 1432 Harrison Street, respectively. Pangea also identified well location number 10 on GeoTracker. Well location number 10 is actually 9 monitoring wells associated with the closed LUFT site at 301 14<sup>th</sup> Street (Chevron Station).

#### 4.1.2 Surface Water Bodies

To identify surface water bodies in the site vicinity, Pangea reviewed USGS topographic maps and satellite photographs and conducted a site reconnaissance visit. The closest surface water body identified is Lake Merritt, located approximately ¼ mile east of the site (at its closest point). San Francisco Bay is located approximately 1 mile southwest of the site (Figure 1).

#### 4.1.3 Land Use

Commercial properties dominate both sides of Webster Street and most of the surrounding areas. Residential properties are present above the commercial properties near the site, but are predominantly located northeast to southeast of the site, adjacent to Lake Merritt.

#### 4.1.4 Well Survey Conclusions

The closest identified wells in the downgradient direction are groundwater monitoring wells approximately 1/8 mile away (Location 5 on Figure 13). The second closest downgradient well(s) are 10 irrigation wells with total depths of approximately 280 ft bgs located approximately 1,360 ft northeast of the site (Location 6 on Figure 13). Due to the distance and relative locations of identified wells, Pangea concludes that hydrocarbons associated with the subject site do not pose a potential risk to impact the identified wells.

### 4.2 Preferential Pathway Evaluation (Conduit Study)

To evaluate the potential for contaminant migration via preferential pathways, Pangea surveyed subsurface utilities beneath the site and nearby vicinity and compared utility depths to groundwater depth and contaminants in site monitoring wells. To conduct the conduit study, Pangea first reviewed a prior conduit study for the site from August 2000 and compared sewer and storm drain depths/locations from the conduit study with maps provided by the City of Oakland (Appendix C). On August 2, 2011, Pangea conducted a site visit to locate and measure depths of subsurface utilities within nearby manholes. A site plan indicating the approximate location and depth of identified subsurface utilities is shown as Figure 14. The conduit study identified several subsurface utilities at or near the site. The identified subsurface utilities near the site include water supply lines, electrical lines, telecommunication lines, sanitary sewers and storm drains.

The primary conduits of concern are the two 18" diameter sanitary sewer lines adjacent to the site, which are the deepest of the identified conduits. Both of these sanitary sewer lines run northeast along Webster Street. The City of Oakland maps indicated that these lines both had a depth of 17 ft bgs and this measurement was confirmed in the field on August 2. It should be noted that as the conduits run along Webster toward 19<sup>th</sup> Street (northeast), the conduits do become shallower due to the sloped nature of the street. The two 18" diameter sanitary sewer lines were measured at nearby manholes to have approximate depths of 13 to 14 ft bgs at the intersection of Webster and 19<sup>th</sup>.

Given the historical range of depth to water in site wells of approximately 18 to 22 ft bgs near the USTs and primary impact area, the 18" diameter sanitary sewer lines have very limited potential to intersect groundwater. Although the potentiometric surface of groundwater could occasionally be shallower than the bottom of these conduits, groundwater was first encountered at approximately 20 ft depth or deeper in site borings near the primary impact area. This information suggests that the sanitary sewer and storm drain lines do *not* likely act as preferential pathways for *significant* contaminant migration.

## 5.0 SCM SUMMARY

### 5.1 SCM Overview

Based on information presented above, Pangea offers the following summary of the SCM:

- On August 3 and 6, 1992, Parker Environmental Services removed one 1,000-gallon and two 500-gallon gasoline underground storage tanks (USTs) from the site. Up to 1,500 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) and up to 12 mg/kg benzene were detected in the soil samples collected from the UST excavation.
- The primary chemicals of concern at the site are TPHg, benzene, toluene, ethylbenzene and xylenes.
- Depth to groundwater in source area site wells has ranged from approximately 18 to 22 ft bgs, with slightly shallower groundwater in more distant downgradient monitoring wells. Groundwater appears to be unconfined, and groundwater flow has been predominately towards the *north* to *northeast*.
- Petroleum hydrocarbons are primarily located in the capillary fringe and shallow saturated zone at depths of approximately 20 to 25 ft bgs. Additional soil impact was detected in shallower unsaturated soil beneath the USTs, dispensers and piping, but this impact was likely remediated by extensive SVE activities. Groundwater impact is primarily in coarse-grain material from approximately 20 to 25 ft. Air sparging has improved groundwater quality, but elevated THPg impact persists in select wells.
- The contaminant plume has been well characterized laterally, although the source area extent downgradient of well MW-2 is not fully delineated. The lack of hydrocarbons in downgradient well MW-5 suggests that the offsite contaminant impact is likely limited to approximately 150 ft downgradient of the site. The vertical extent of hydrocarbons in groundwater has been mostly delineated by sampling from the onsite air sparge wells.
- Subsurface conduits were identified near the site at depths of approximately 17 ft bgs in Webster Street. Given the historic range of groundwater fluctuation between approximately 18 and 22 ft bgs,

near the source area, the conduits have *limited* potential to intersect groundwater and act as preferential pathways for contaminant migration.

- No subslab or shallow soil gas sampling has been performed onsite to evaluate risk to onsite commercial buildings.

## 5.2 Data Gaps

Based upon our review of available information, Pangea identified the following apparent data gaps:

- The elevated TPHg and benzene concentrations in soil and groundwater at in the source area suggest that subslab/soil gas monitoring within the onsite building is merited.
- There is limited soil and plume characterization data immediately downgradient of well MW-2, which could be acting as an ongoing source of hydrocarbons.
- The vertical extent of the TPHg plume has not been fully delineated below 30 ft depth, although the vertical extent of benzene appears vertically delineated by source area air sparge wells.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

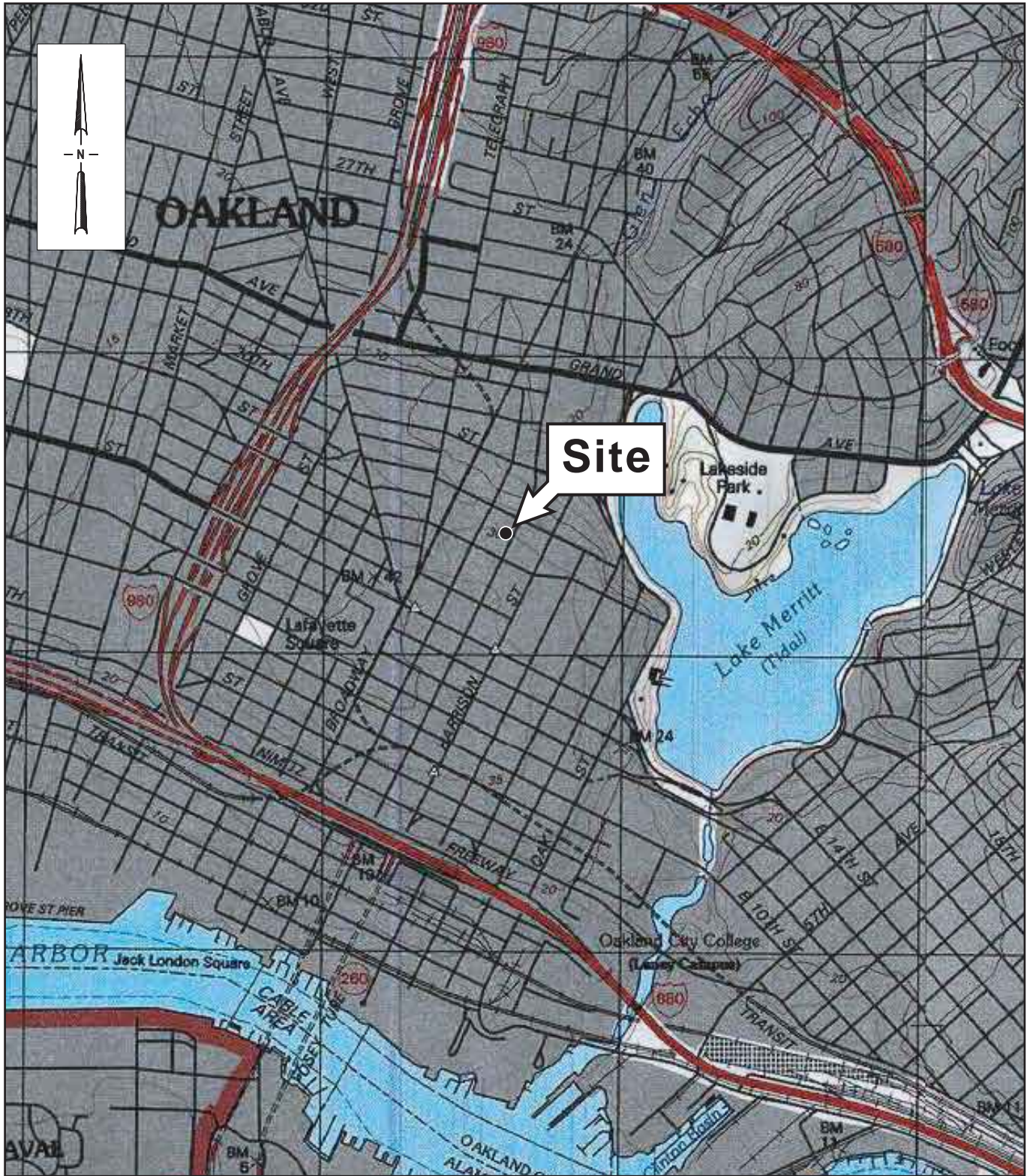
Based on the above information, Pangea offers the following conclusions and recommendations:

- Soil gas and/or subslab gas sampling is recommended to evaluate the potential for vapor intrusion into indoor air for the onsite and adjacent retail buildings. Pangea recommends installing a subslab probe in building 1 and building 2 at the site for ongoing monitoring of subslab gas beneath the buildings (Figure 2). Pangea recommends sampling of these probe locations during the dry season and wet season to evaluate subsurface vapor conditions at different times.
- If the agency is concerned about the limited characterization downgradient of MW-2 and below 30 ft depth in the source area (and downgradient area near MW-2), Pangea would recommend additional site assessment. However, more recent data suggests the plume is attenuating near well MW-2. Pangea recommends sampling of AS-1 to evaluate hydrocarbon attenuation in deeper site groundwater.
- If the agency is concerned about the persistent elevated TPHg concentrations in source area well MW-2 (20,000 ug/L, January 2012), Pangea recommends limited additional cost-effective site remediation. Pangea would recommend the following low-cost alternative: repair of the existing air sparge compressor and enhancement of site remediation using a bioorganic catalyst within select existing site wells (AS-1, AS-2 and AS-3) to help desorb and degrade the residual and apparently recalcitrant hydrocarbons.

## REFERENCES

- Cambria Environmental Technology, Inc., 2000, (Cambria), *Conduit Study and File Review Report*, 1721 Webster Street, Oakland, CA, August 8.
- Parker Environmental Services, 1992, (Parker), *Underground Tank Removal Soil Sampling and Analysis Report*, 1721 Webster Street, Oakland, CA, August 12.
- Radbruch, 1957, (Radbruch, D), *Areal and Engineering Geology of the Oakland West Quadrangle, Miscellaneous Geological Investigation*, U.S. Geological Survey Map I-239.





SOURCE: TOPOI MAPS

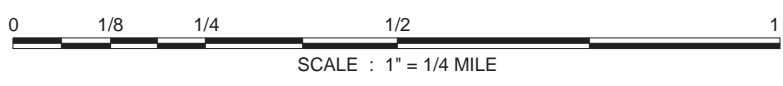


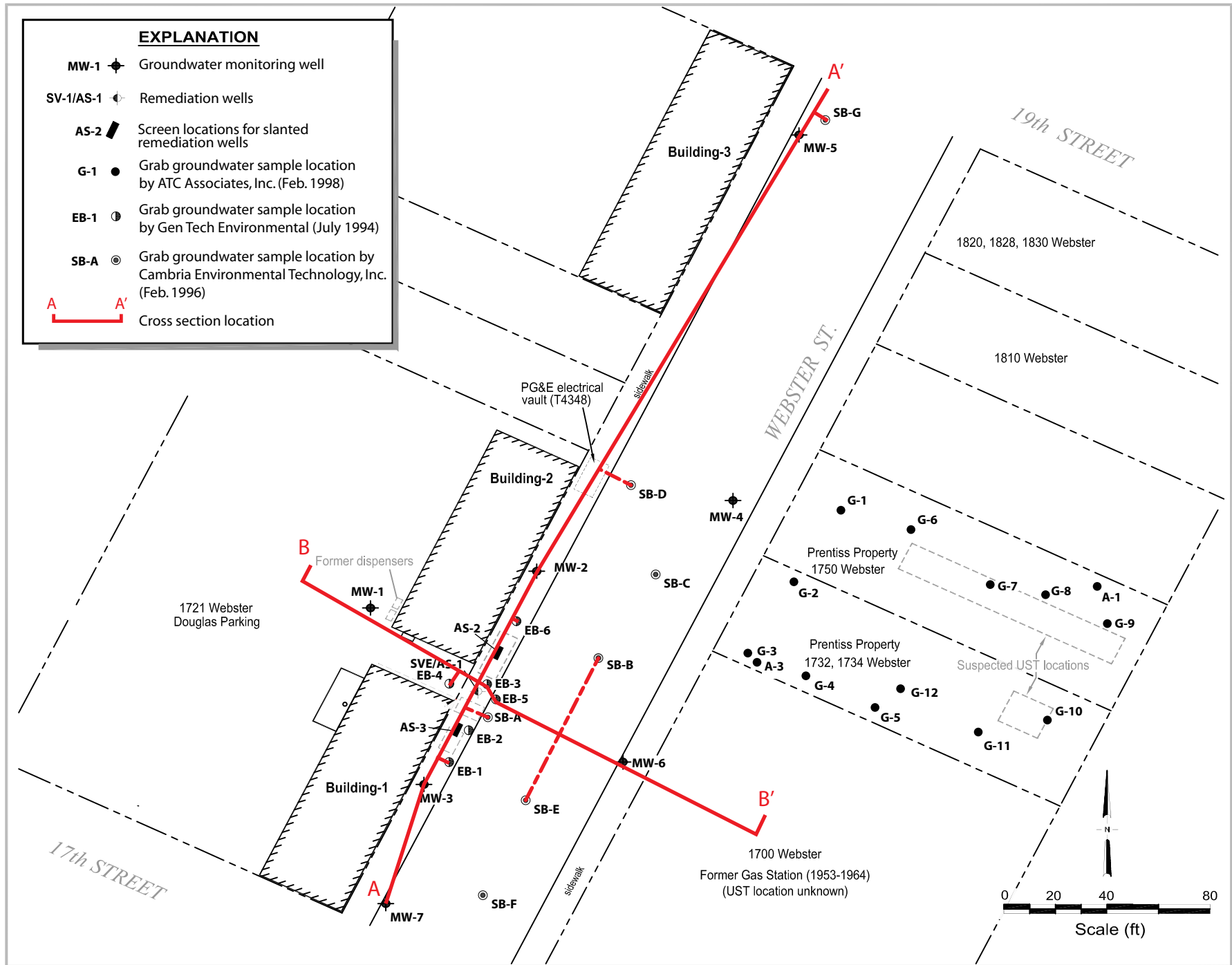
Figure 1

Douglas Parking Facility  
1721 Webster Street  
Oakland, California



Vicinity Map



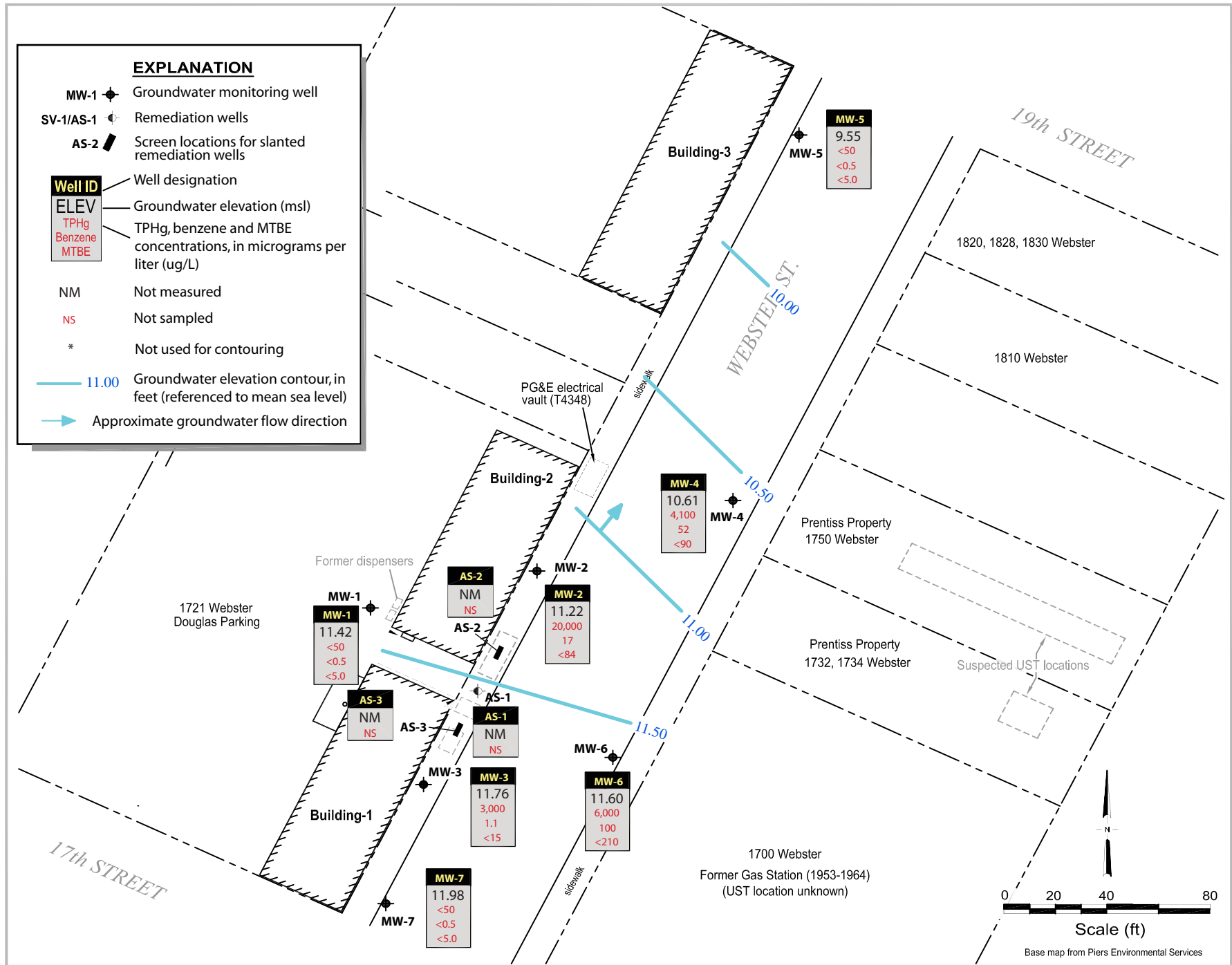


**Douglas Parking**  
 1721 Webster Street  
 Oakland, California



**Cross Section Location Map**

FIGURE  
**2**

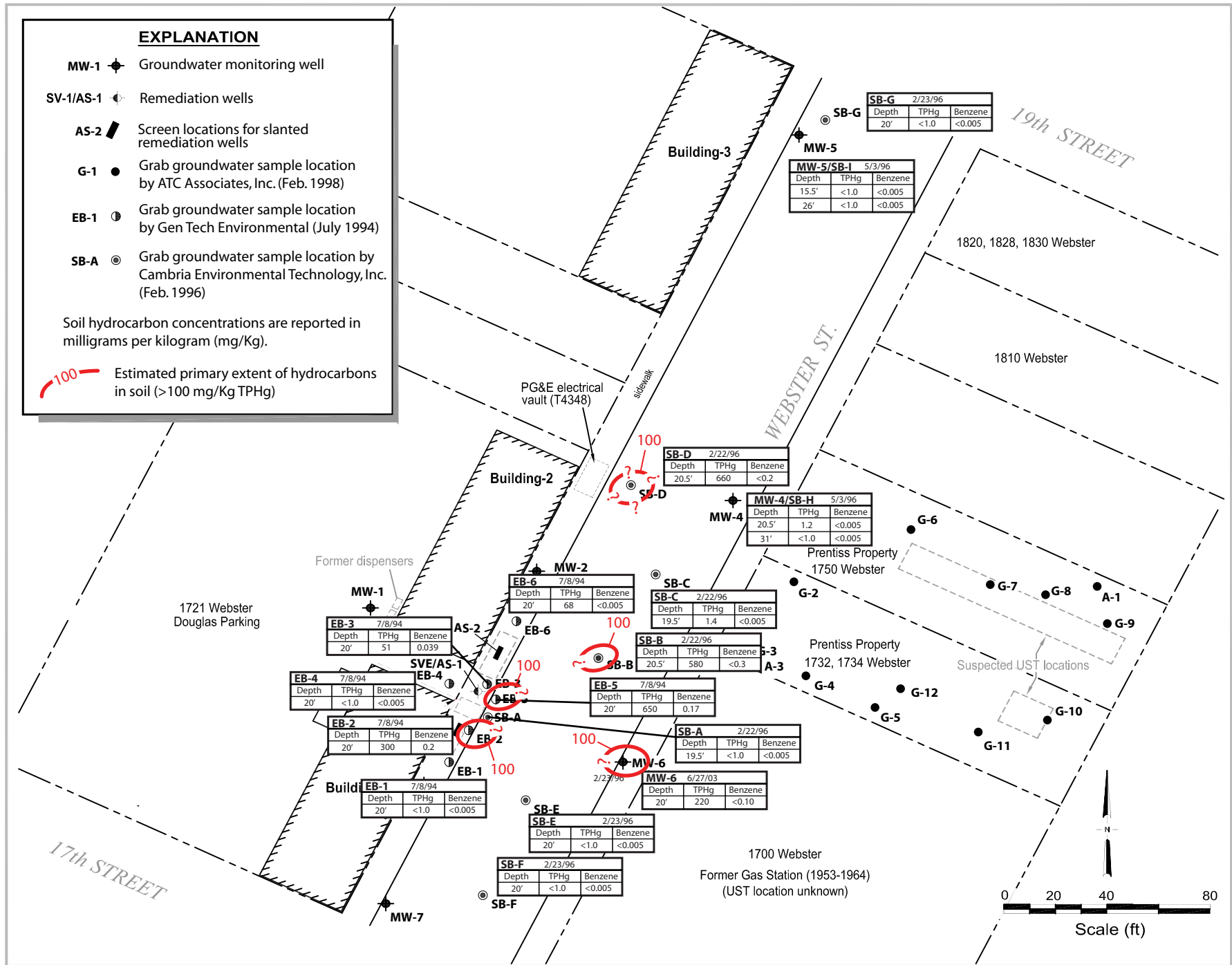


**Douglas Parking**  
 1721 Webster Street  
 Oakland, California



**Groundwater Elevations and  
 Hydrocarbon Concentration Map**  
 January 11, 2012

FIGURE  
**3**

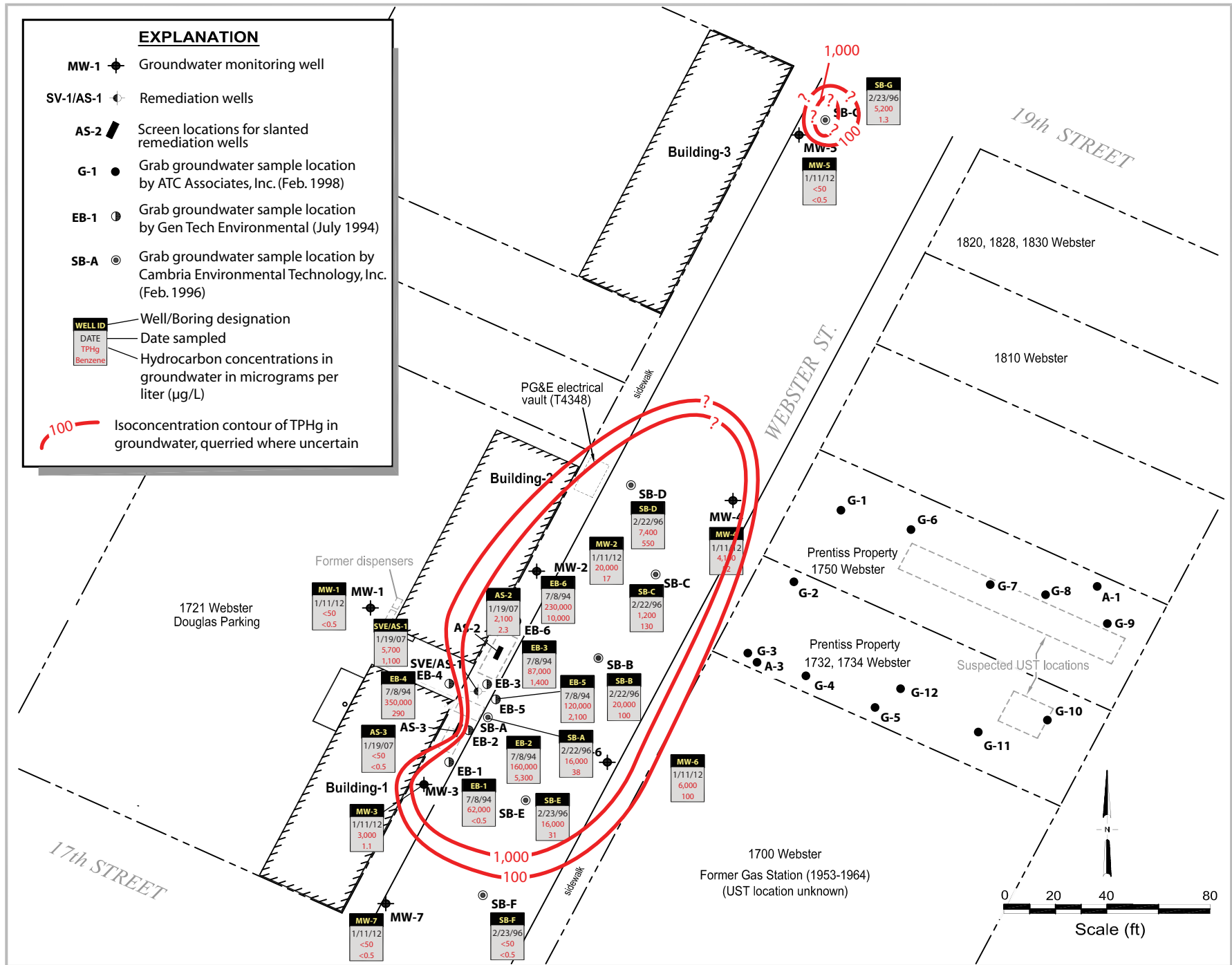


Douglas Parking  
1721 Webster Street  
Oakland, California



Extent of TPHg in Soil

FIGURE

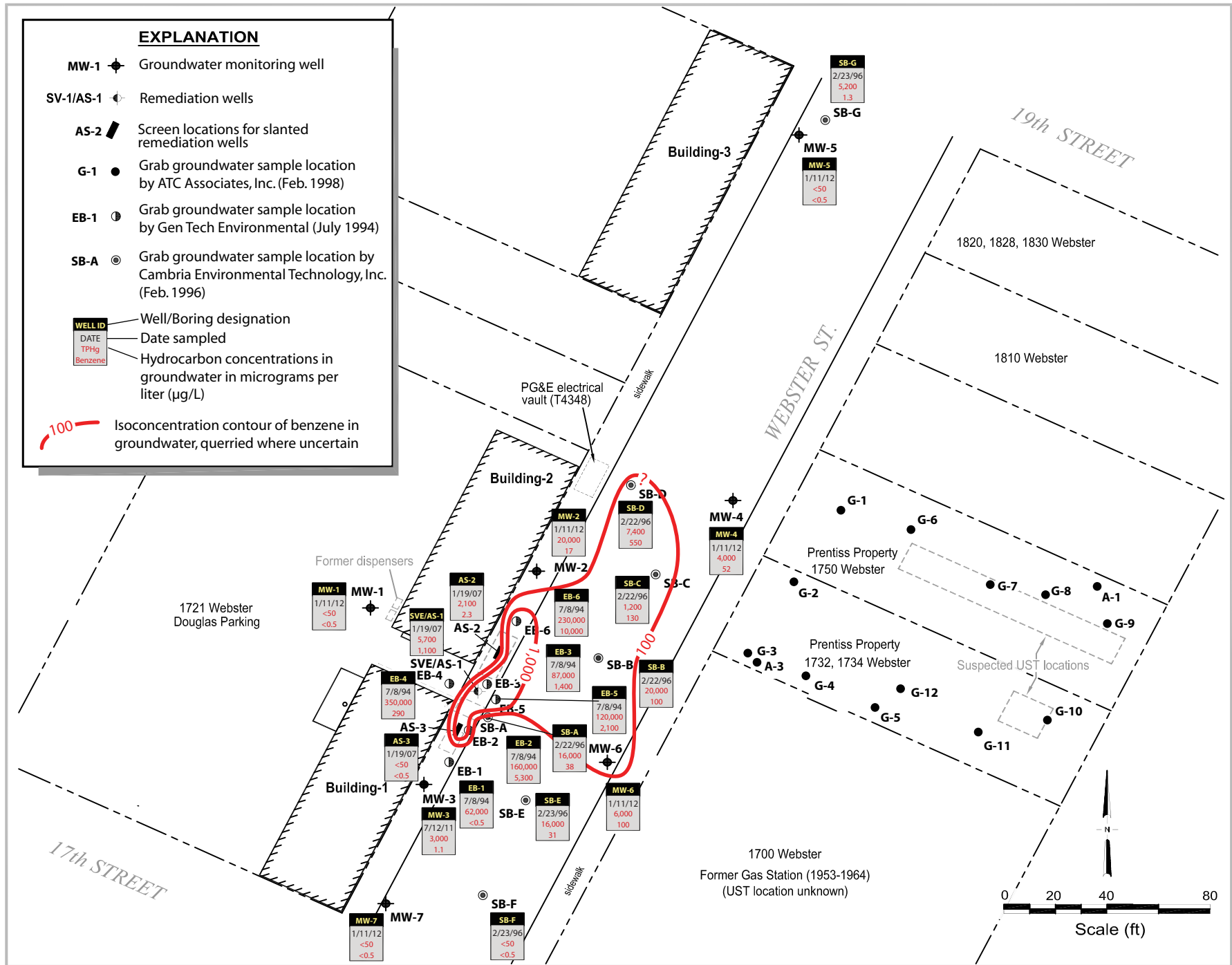


Douglas Parking  
1721 Webster Street  
Oakland, California



Extent of TPHg in  
Groundwater with Historic  
Grab Sample Results

FIGURE  
5

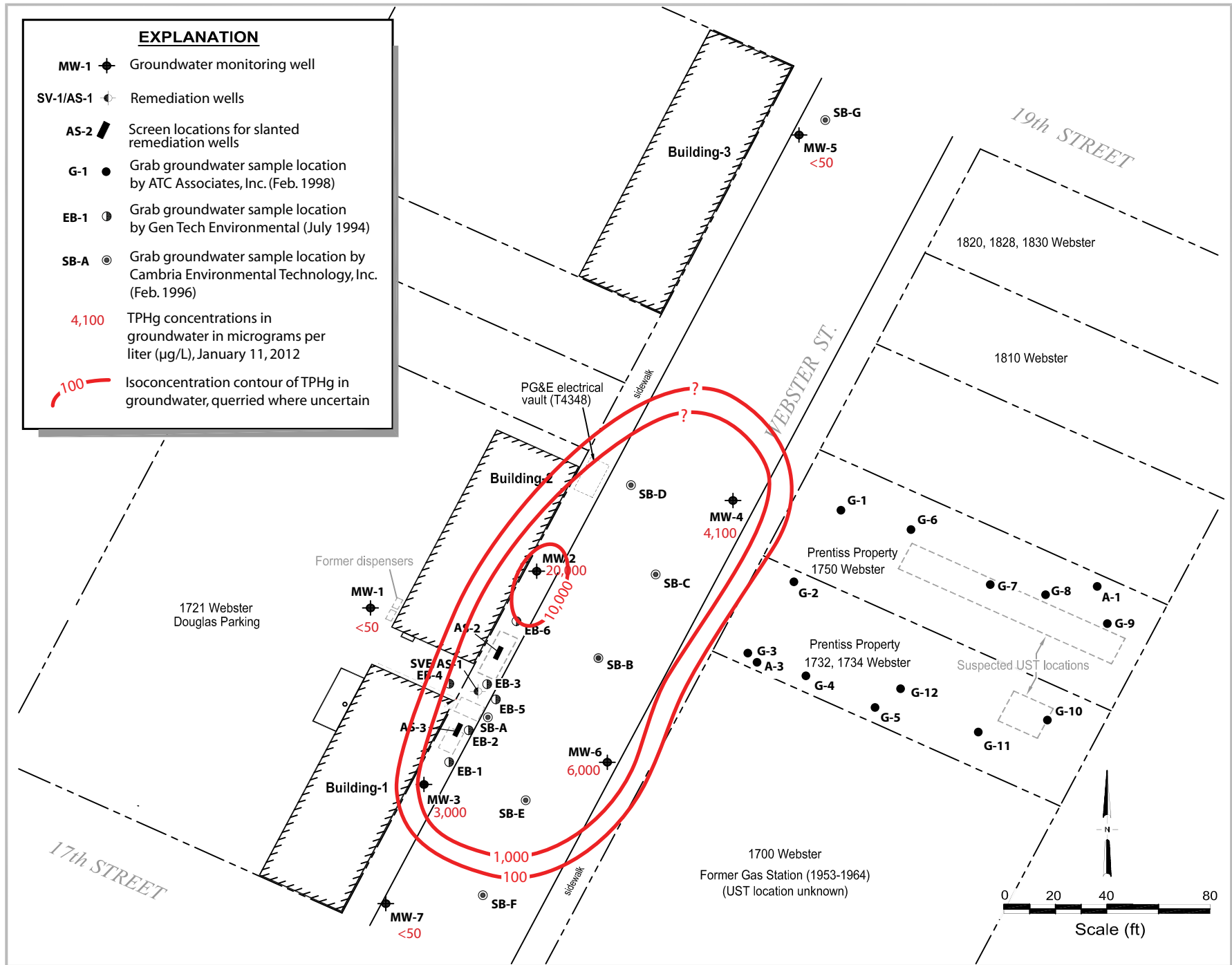


**Douglas Parking**  
 1721 Webster Street  
 Oakland, California



**Extent of Benzene in Groundwater with Historic Grab Results**

FIGURE

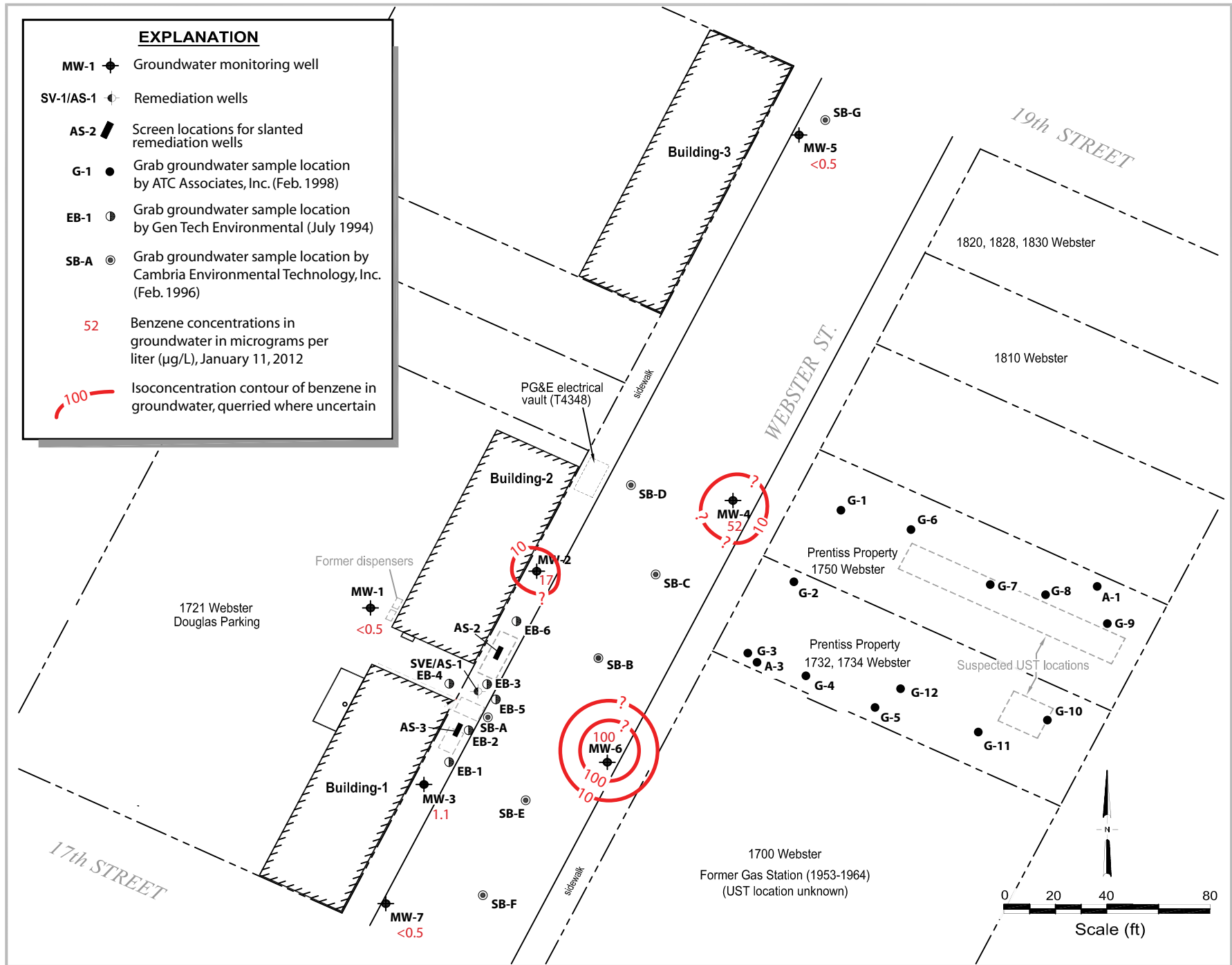


**Douglas Parking**  
 1721 Webster Street  
 Oakland, California



**Current Extent of TPHg in Groundwater (Well Data Only)**

FIGURE  
**7**



**Douglas Parking**  
 1721 Webster Street  
 Oakland, California



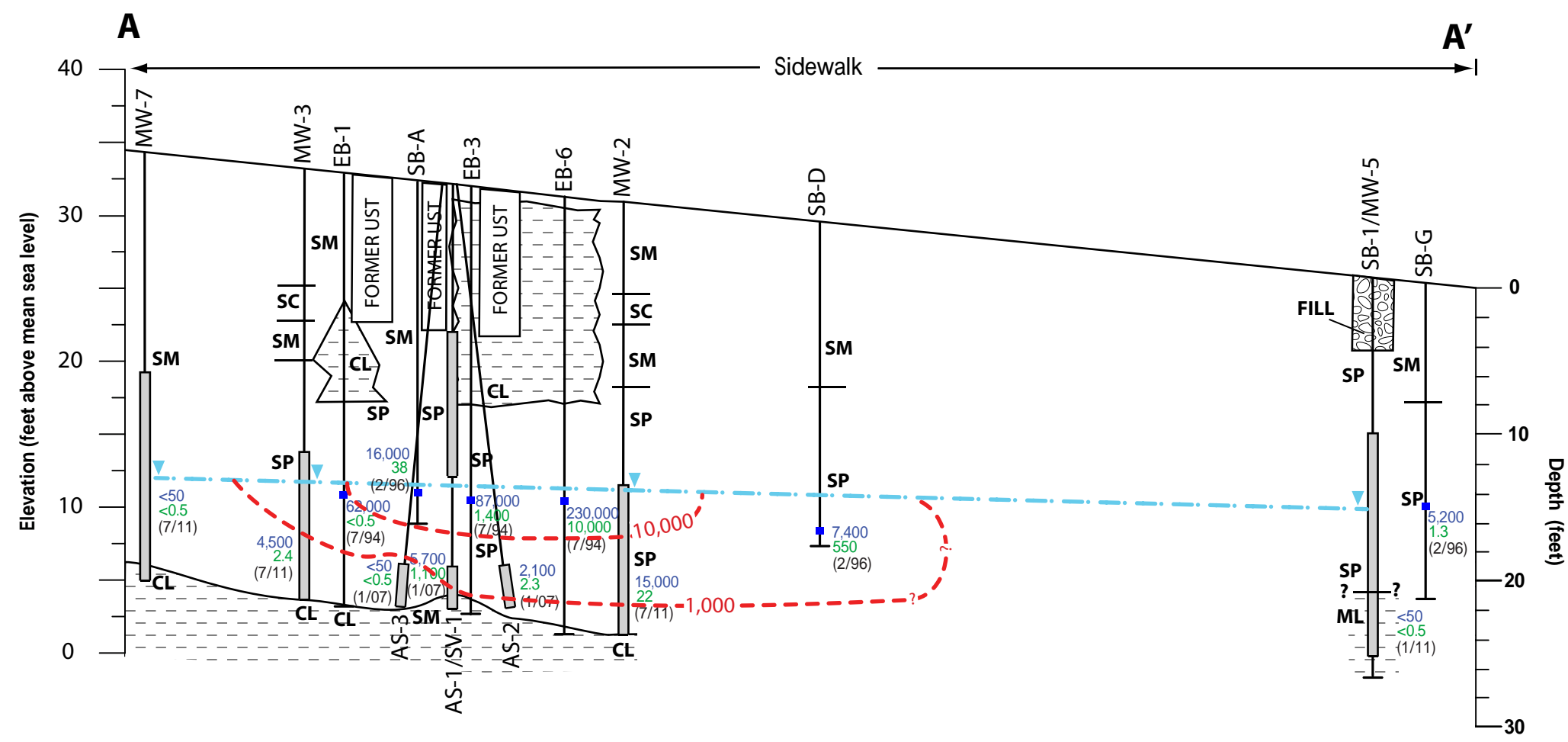
**Current Extent of Benzene  
 in Groundwater  
 (Well Data Only)**

FIGURE  
**8**

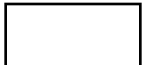
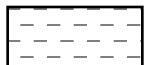












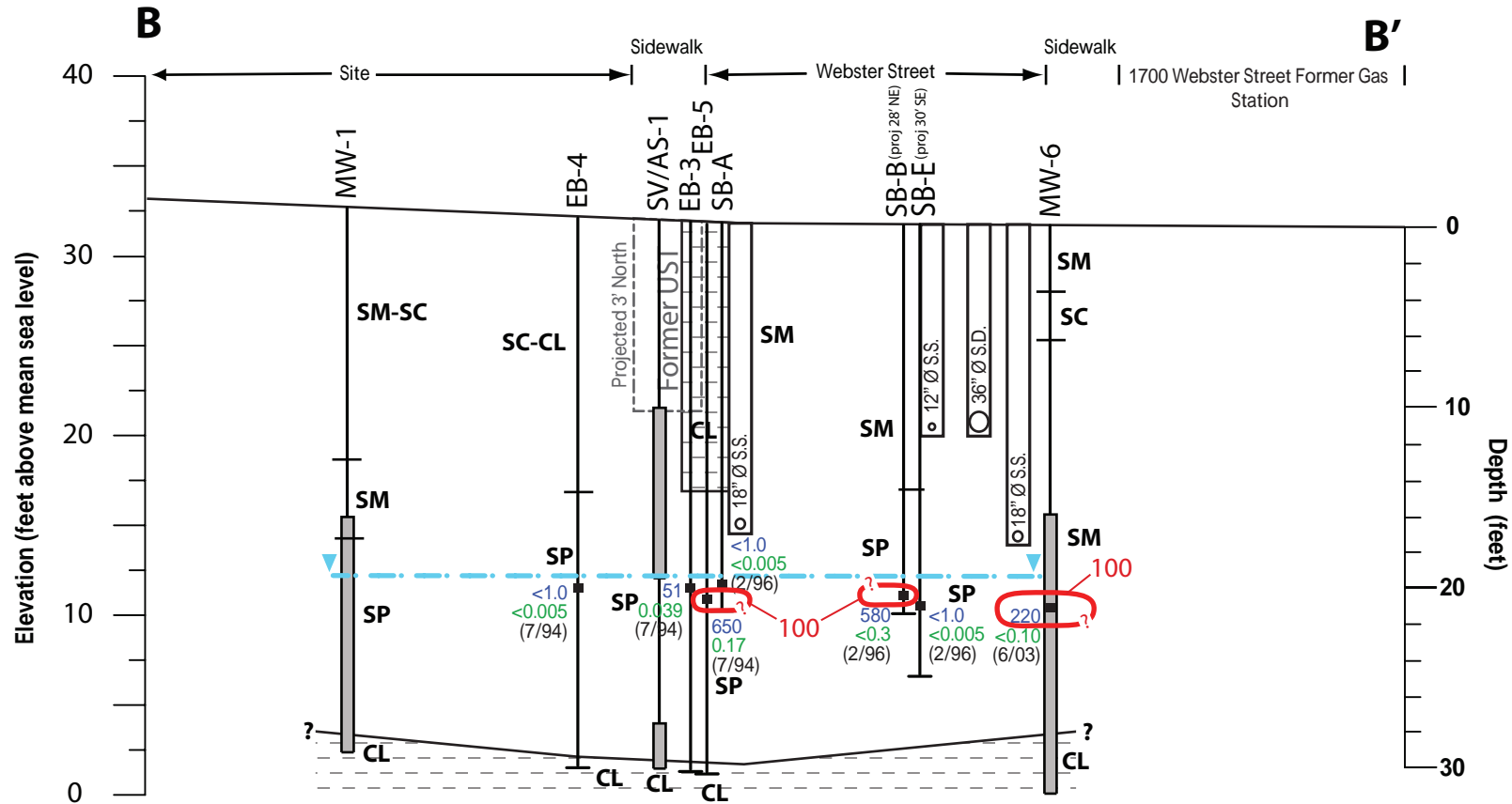
**EXPLANATION**

 Coarse (Sands)   Fine (Silt or Clay)	 Static groundwater elevation piezometric surface (July 2011)   TPHg Isoconcentration contour (µg/L); queried where uncertain	 MW-3 4,500 2.4 (7/11) Groundwater monitoring well  Groundwater sample location and TPHg/ benzene concentrations (sample date, µg/L)
		 EB-1 16,000 38 (2/96) Soil boring showing approximate groundwater sample location, first encountered groundwater.  TPHg and benzene concentrations in grab groundwater (sample date, µg/L)

NOTE: TPHg concentrations in groundwater monitoring wells are considered more representative of groundwater conditions than grab samples from temporary borings/wells.

Vertical Exaggeration  
1:4  
Horizontal  
Scale in Feet  
0 20 40

Figure  
**10**



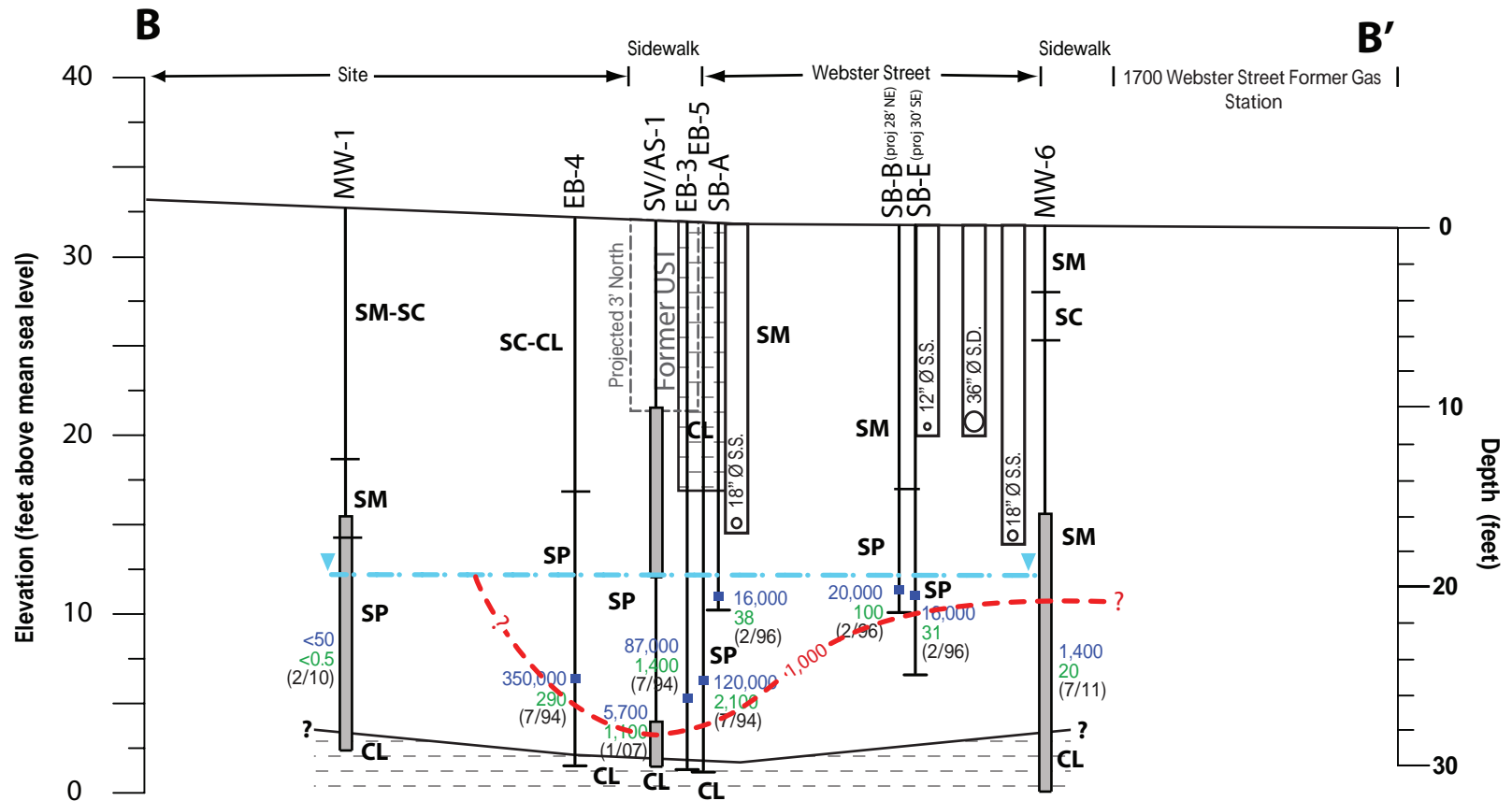
Vertical Exaggeration  
1:3  
Horizontal  
Scale in Feet



**EXPLANATION**

- Coarse (Sands)
- Fine (Silt or Clay)
- Static groundwater elevation piezometric surface (July 2011)
- TPHg Isoconcentration contour (µg/L); queried where uncertain
- Groundwater monitoring well
- Soil sample location and TPHg/benzene concentrations (sample date, mg/Kg)
- Soil boring showing approximate soil sample location, and TPHg and benzene concentrations (sample date, mg/Kg)

Figure  
**11**



Vertical Exaggeration  
1:3  
Horizontal  
Scale in Feet



### EXPLANATION

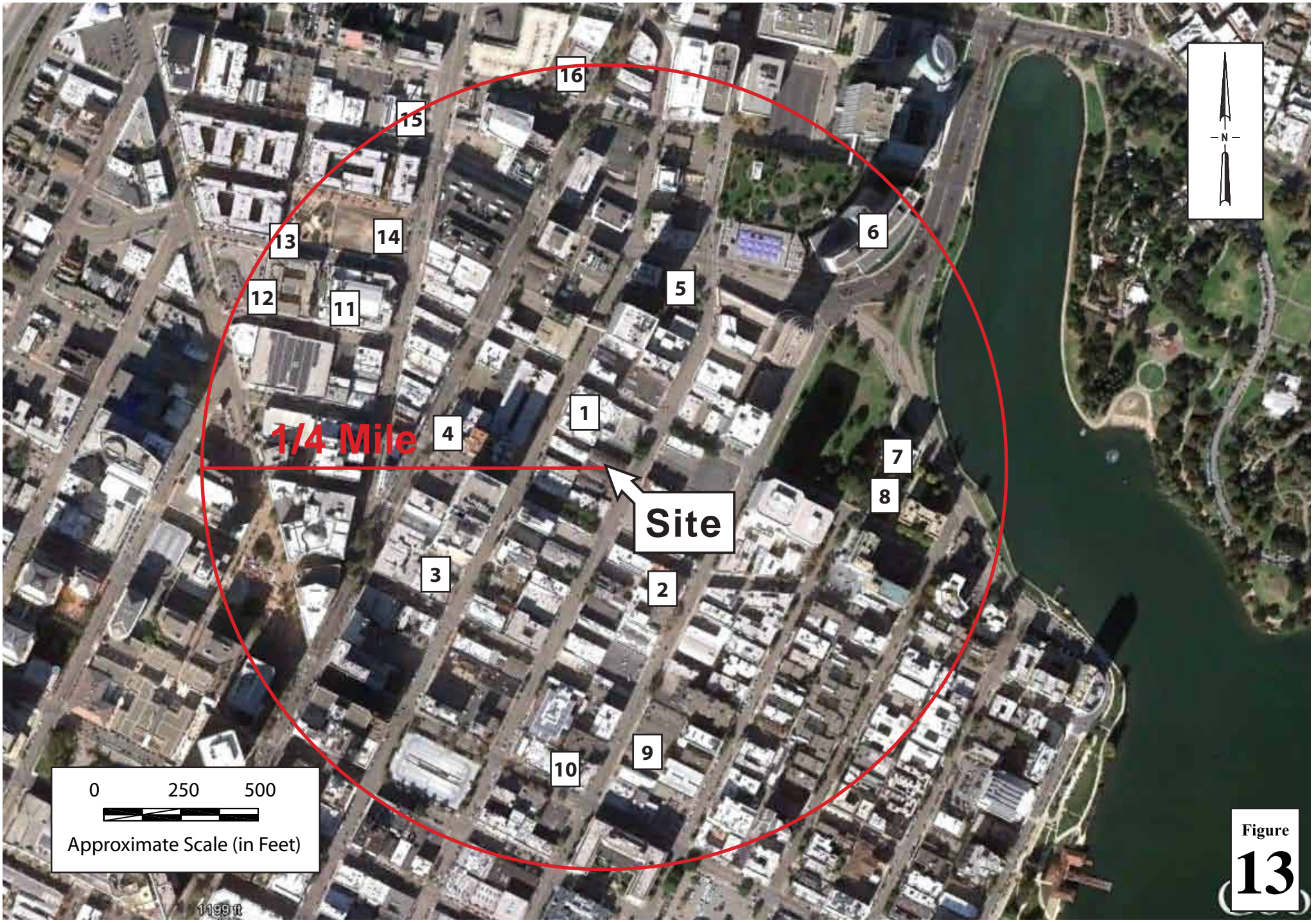
- Coarse (Sands)
- Fine (Silt or Clay)
- Static groundwater elevation piezometric surface (July 2011)
- TPHg Isoconcentration 100 contour (µg/L); queried where uncertain
- MW-5 Groundwater monitoring well
- Groundwater sample location and TPHg/benzene concentrations (sample date, µg/L)
- EB-1 Soil boring showing approximate groundwater sample location, and TPHg and benzene concentrations (sample date, µg/L)

NOTE 1 - TPHg concentrations in groundwater monitoring are considered more representative of groundwater conditions than grab samples from temporary borings/wells.

NOTE 2 - Greater weight is given to more recent TPHg concentration data as it is considered more representative of current groundwater conditions.

Figure  
**12**





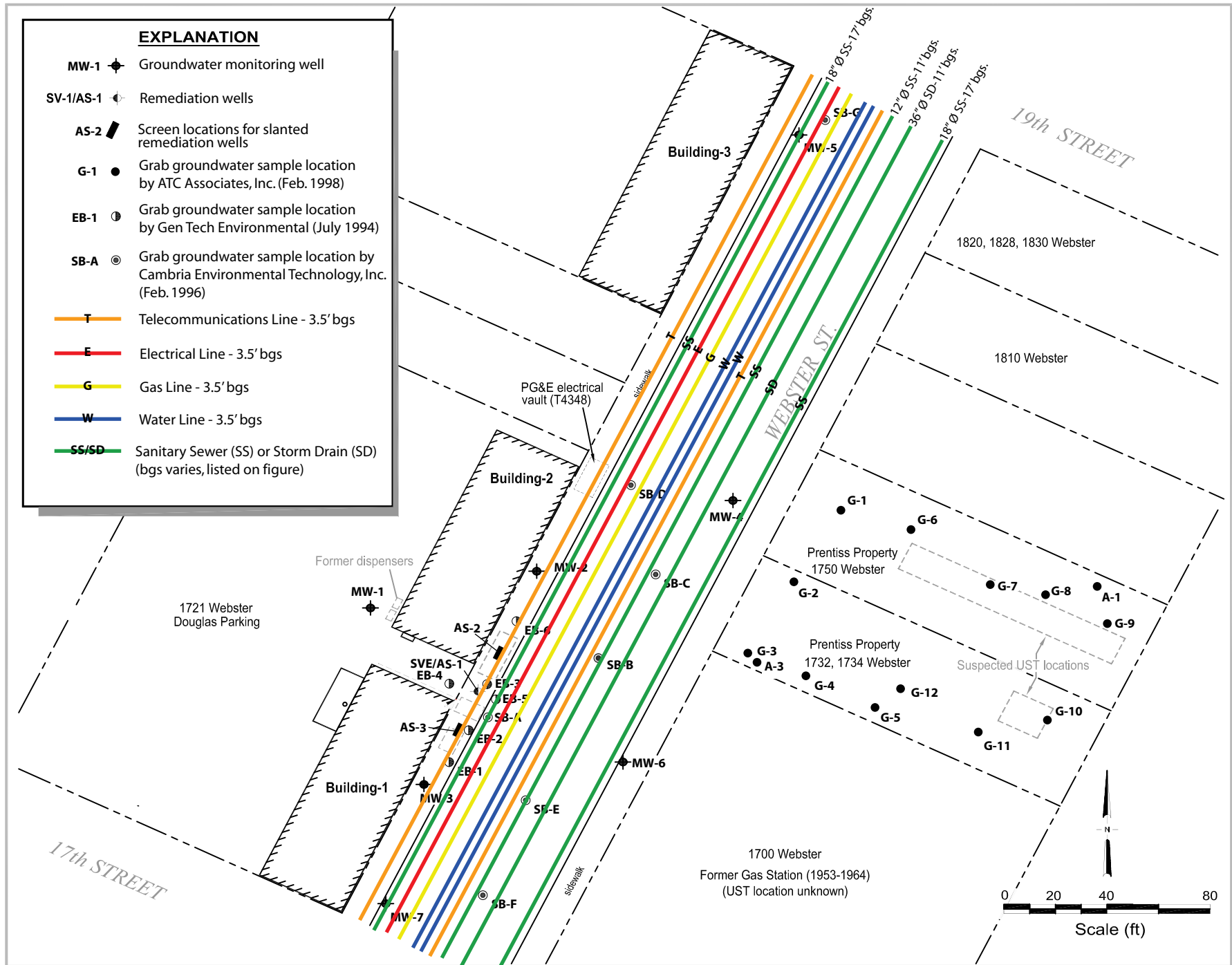
**Douglas Parking**  
1721 Webster Street  
Oakland, California



**Well Location Map**

Figure  
**13**





**Douglas Parking**  
 1721 Webster Street  
 Oakland, California



**Subsurface Utility  
 Map**

FIGURE  
**14**

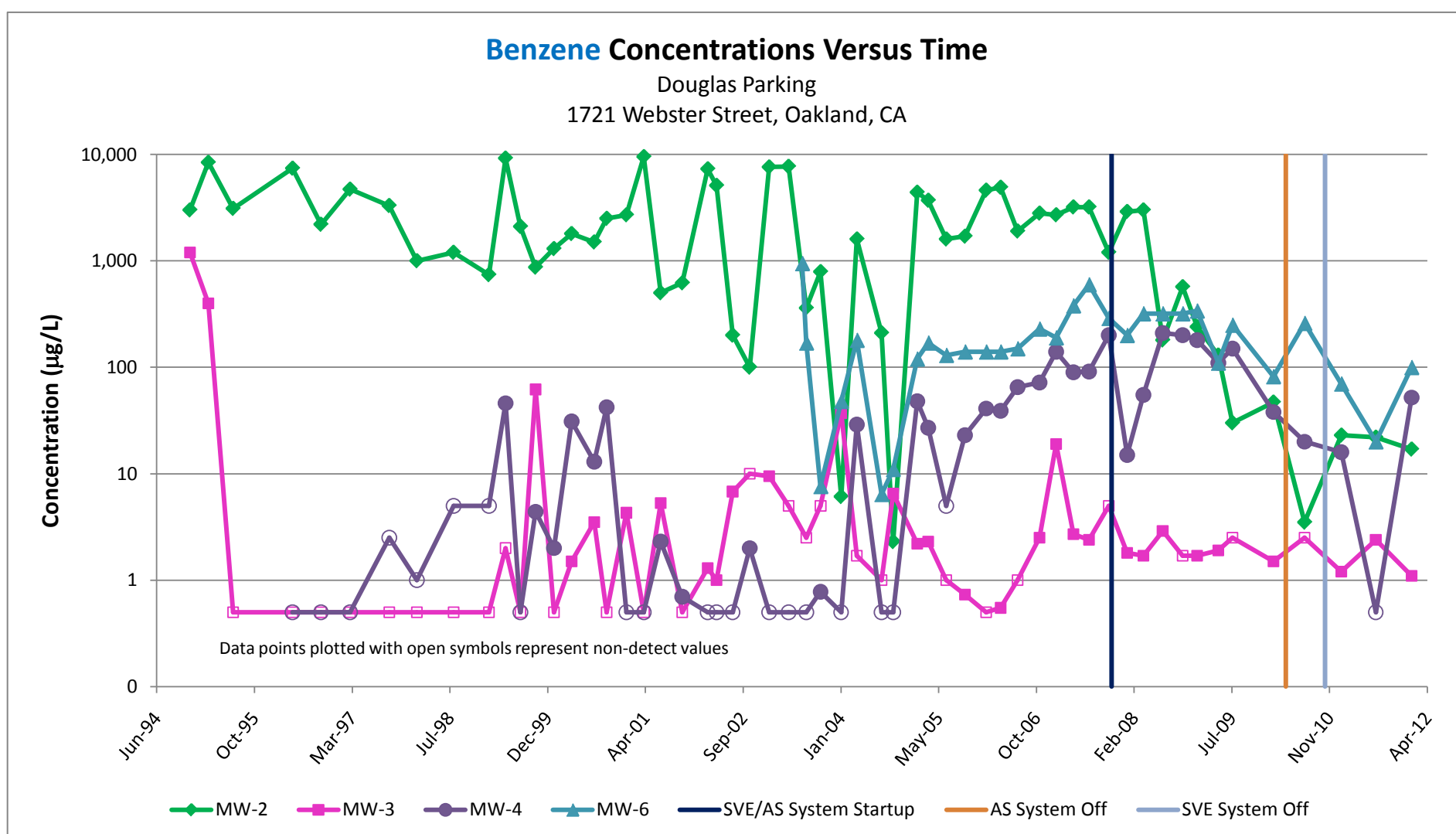
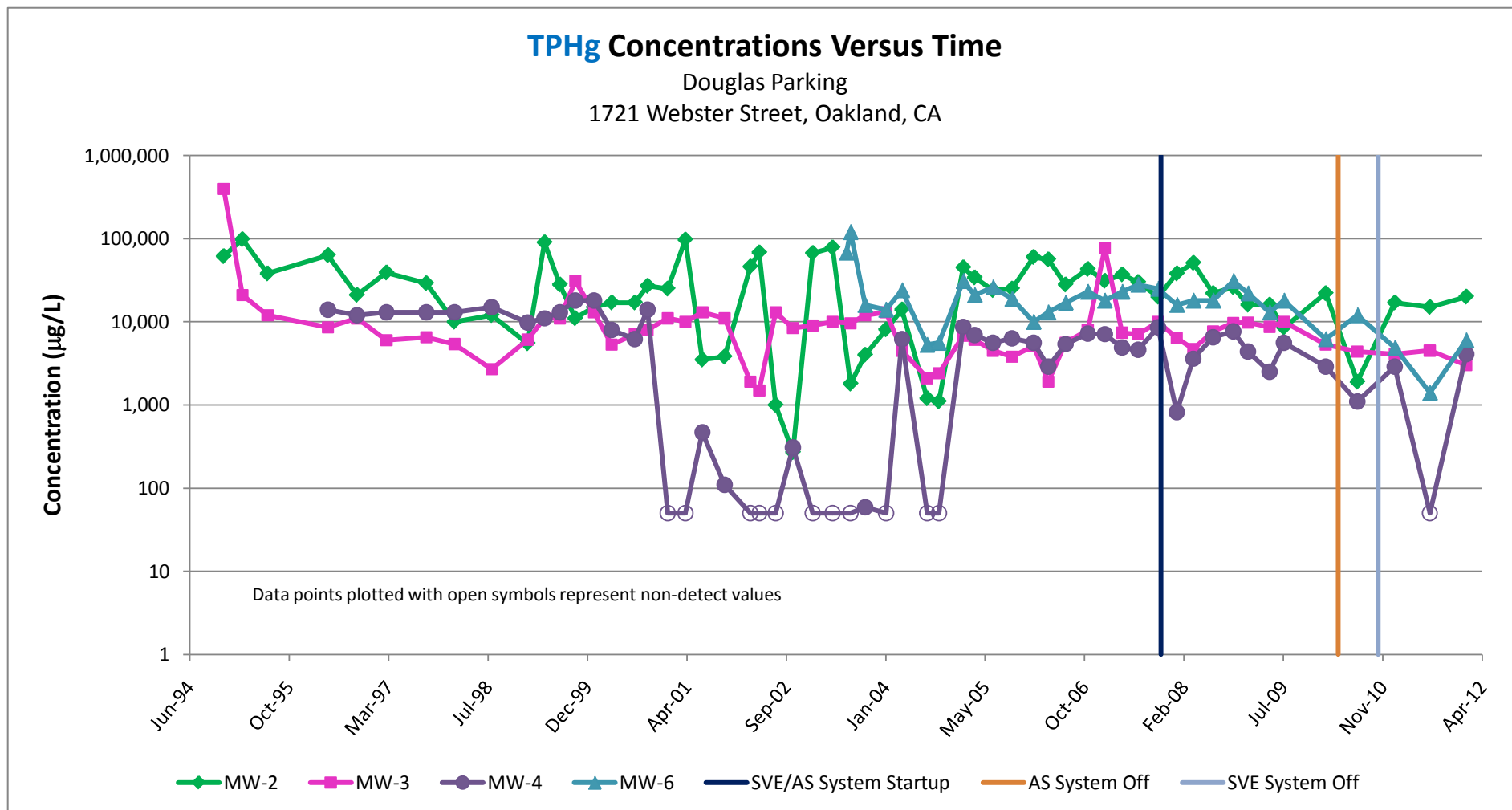


Figure 15 - TPHg and Benzene Concentration Trends in Groundwater

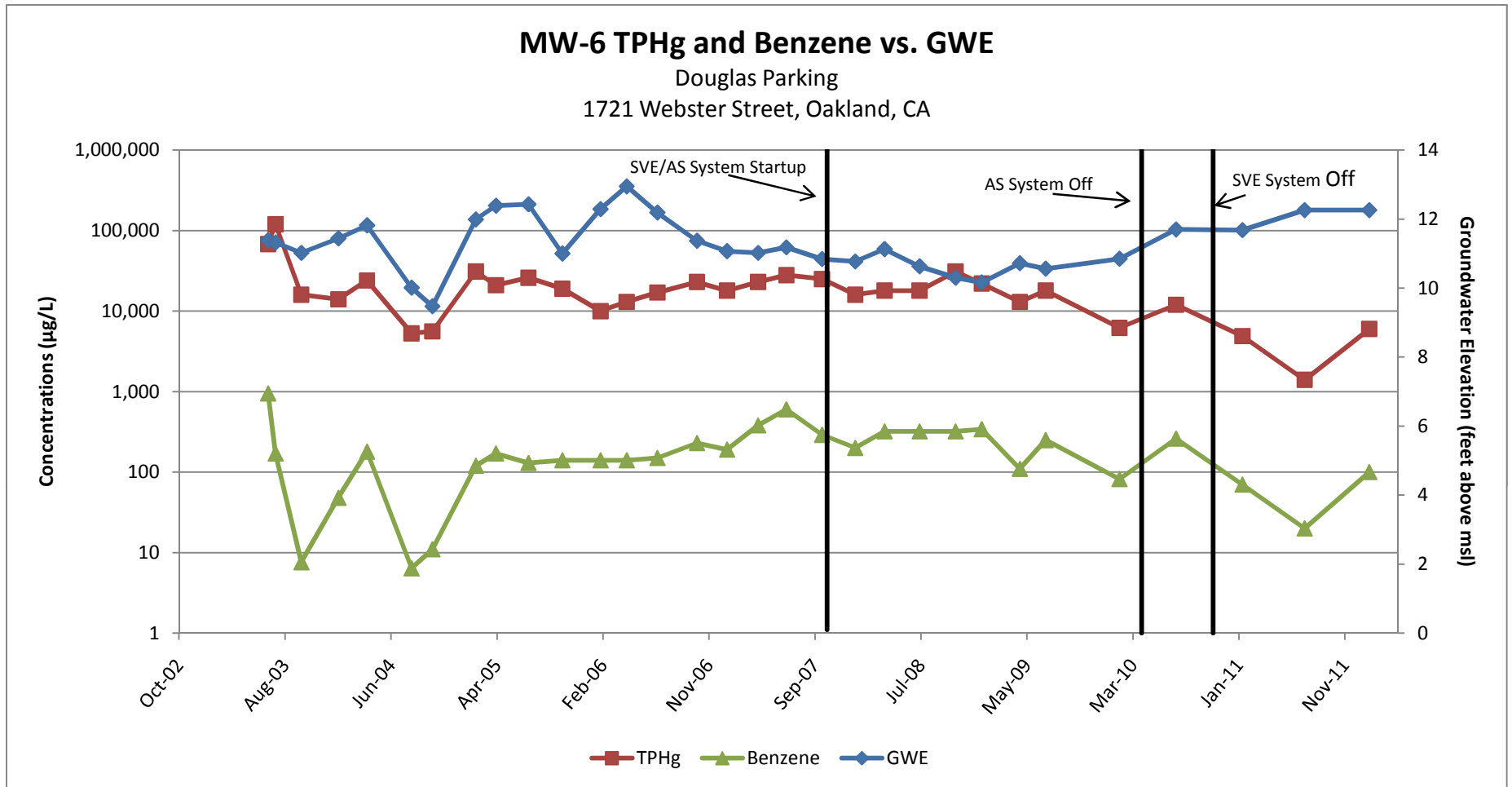


Figure 16 - TPHg and Benzene Concentrations vs. Groundwater Elevation

## TPHg Concentrations in Groundwater vs. Distance From Source

Douglas Parking  
1721 Webster Street, Oakland, CA

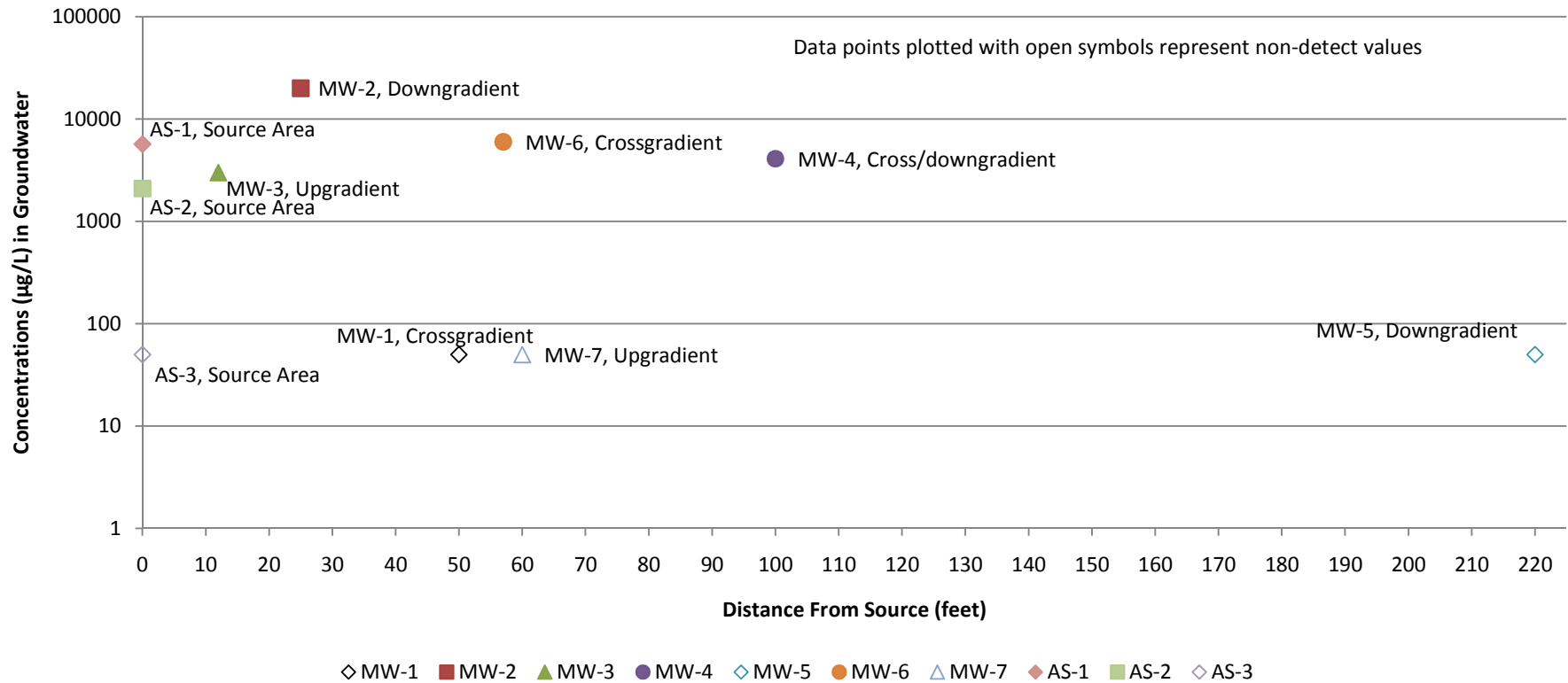


Figure 17 - TPHg Concentrations vs. Distance From Source



# Pangea

**Table 1. Soil Analytical Data: Petroleum Hydrocarbons - 1721 Webster Street, Oakland, California**

Sample ID	Date Sampled	Sample Depth (ft)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
			← mg/kg →					
Comm. ESL - Indoor Air Impacts			Use soil gas	Use soil gas	Use soil gas	Use soil gas	Use soil gas	Use soil gas
Comm. ESL - Urban Ecotoxicity			--	25	--	--	--	--
Comm. ESL - Ceiling Value			500	870	650	400	420	500
Comm. ESL - Direct Exposure			450	0.27	210	5.0	100	65
Comm. ESL - GW Protection (Leaching)			83	0.044	2.9	3.3	2.3	0.023
Final ESL - Commercial, Drinking Water Resource			<b>83</b>	<b>0.044</b>	<b>2.9</b>	<b>3.3</b>	<b>2.3</b>	<b>0.023</b>

## Cambria Environmental Technology, Inc. - 2003

MW-6	6/27/2003	20.0	<b>220</b>	<0.10	0.14	<0.10	0.35	<1.0
------	-----------	------	------------	-------	------	-------	------	------

## Cambria Environmental Technology, Inc. - 1996

SB-A	2/22/1996	19.5	<1.0	<0.005	0.007	<0.005	<0.005	--
SB-B	2/22/1996	20.5	<b>580</b>	<0.3	1.3	1.8	<b>4.2</b>	--
SB-C	2/22/1996	19.5	1.4	<0.005	0.013	0.027	0.12	--
SB-D	2/22/1996	20.5	<b>660</b>	<0.2	2.3	<0.2	<b>5.2</b>	--
SB-E	2/23/1996	20.5	<1.0	<0.005	0.009	<0.005	<0.005	--
SB-F	2/23/1996	20.0	<1.0	<0.005	0.006	<0.005	<0.005	--
SB-G	2/23/1996	20.0	<1.0	<0.005	0.009	<0.005	<0.005	--
SB-H	5/3/1996	20.5	1.2	<0.005	0.006	0.025	0.038	--
(MW-4)	5/3/1996	31.0	<1.0	<0.005	<0.005	<0.005	<0.005	--
SB-I	5/3/1996	15.5	<1.0	<0.005	<0.005	<0.005	<0.005	--
(MW-5)	5/3/1996	26.0	<1.0	<0.005	<0.005	<0.005	<0.005	--

## Gen-Tech Environmental - 1994

EB-1@20	7/8/1994	20.0	<1.0	<0.005	<0.005	<0.005	<0.005	--
EB-2@20	7/8/1994	20.0	<b>300</b>	<b>0.2</b>	1.7	0.26	<b>3.0</b>	--
EB-3@20	7/8/1994	20.0	51	0.039	0.56	0.32	<b>2.9</b>	--
EB-4@20	7/8/1994	20.0	<1.0	<0.005	<0.005	<0.005	<0.005	--
EB-5@20	7/8/1994	20.0	<b>650</b>	<b>0.17</b>	<b>5.2</b>	<b>4.4</b>	<b>48</b>	--
EB-6@20	7/8/1994	20.0	68	<0.005	<b>22</b>	<b>4.3</b>	<b>23</b>	--

## Parker Environmental - 1992

### Beneath UST Samples

T-1	8/3/1992	9.0	<b>150</b>	<b>2.2</b>	<b>2.9</b>	1.8	<b>13</b>	--
T-2	8/3/1992	9.0	<b>120</b>	<b>0.62</b>	0.56	0.87	2.2	--
T-3	8/6/1992	8.0	<b>580</b>	<b>1.7</b>	<b>5.9</b>	<b>5.6</b>	<b>43</b>	--
T-4	8/6/1992	8.0	<b>1,500</b>	<b>11</b>	<b>140</b>	<b>48</b>	<b>280</b>	--
T-5	8/6/1992	8.0	<b>410</b>	<b>6.7</b>	<b>22</b>	<b>6.2</b>	<b>35</b>	--
T-6	8/6/1992	12.0	<b>1,400</b>	<b>12</b>	<b>71</b>	<b>29</b>	<b>150</b>	--
T-7	8/6/1992	14.0	2.3	<b>0.11</b>	0.19	0.05	0.31	--

### South Excavation Sidewall Samples

SW1	8/6/1992	9.5	<b>280</b>	<b>2.9</b>	<b>5.8</b>	3.2	<b>15</b>	--
SW2	8/6/1992	7.0	<b>1,500</b>	<b>5.7</b>	<b>40</b>	<b>18</b>	<b>150</b>	--
SW3	8/6/1992	8.0	<b>400</b>	<b>2.7</b>	<b>5.8</b>	<b>4.0</b>	<b>21</b>	--
SW4	8/6/1992	9.0	2.3	<b>0.42</b>	0.028	0.077	0.18	--

# Pangea

**Table 1. Soil Analytical Data: Petroleum Hydrocarbons - 1721 Webster Street, Oakland, California**

Sample ID	Date Sampled	Sample Depth (ft)	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
			← mg/kg →					
Comm. ESL - Indoor Air Impacts			Use soil gas	Use soil gas	Use soil gas	Use soil gas	Use soil gas	Use soil gas
Comm. ESL - Urban Ecotoxicity			--	25	--	--	--	--
Comm. ESL - Ceiling Value			500	870	650	400	420	500
Comm. ESL - Direct Exposure			450	0.27	210	5.0	100	65
Comm. ESL - GW Protection (Leaching)			83	0.044	2.9	3.3	2.3	0.023
Final ESL - Commercial, Drinking Water Resource			<b>83</b>	<b>0.044</b>	<b>2.9</b>	<b>3.3</b>	<b>2.3</b>	<b>0.023</b>

**Piping and Dispenser Samples**

L-1	8/3/1992	1.5	2.6	<0.005	0.01	<0.005	0.03	--
L-2	8/3/1992	1.5	<1.0	<0.005	<0.005	<0.005	<0.005	--
L-3	8/3/1992	1.5	<1.0	<0.005	<0.005	<0.005	<0.005	--
L-4	8/3/1992	1.5	<1.0	<0.005	<0.005	<0.005	<0.005	--
L-5	8/3/1992	2.0	8.2	0.01	0.02	0.012	0.092	--
L-6	8/3/1992	2.0	<1.0	<0.005	0.007	<0.005	0.034	--

**Stockpile Samples**

C1	8/6/1992	1.5	<b>560</b>	<0.1	<b>5.0</b>	3.1	<b>24</b>	--
----	----------	-----	------------	------	------------	-----	-----------	----

**Notes, Abbreviations and Methods:**

mg/kg = Milligrams per kilogram, approximately equivalent to parts per million (ppm).

TPHd = Total petroleum hydrocarbons as diesel by modified EPA Method 8015.

TPHg = Total petroleum hydrocarbons by EPA Method 8015.

BTEX = Benzen, toluene, ethylbenzene, xylenes by EPA Method 8020/8021.

MTBE = Methyl tertiary-butyl ether by EPA Method 8020.

ESL = Environmental Screening Levels for shallow soil with commercial/industrial land use where groundwater is a current or potential drinking water resource from Table A-2, established by the SFBRWQCB, Interim Final - November 2007 (Revised May 2008).

**Bold** = Concentration equals or exceeds the Final ESL.

-- = Not available or not analyzed.

< n = Chemical not present at a concentration in excess of detection limit shown.



# PANGEA

**Table 2 - Groundwater Elevation and Analytical Data.**  
Douglas Parking Company, 1721 Webster Street, Oakland, California

Boring / Well ID <i>TOC</i>	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene Xylenes MTBE (µg/L)		
							←	→	→
MW-2	12/2/1994	19.50	7.60	61,300	3,000	3,900	160	4,500	-
27.10	3/6/1995	18.49	8.61	98,000	8,400	16,000	2,000	2,600	-
27.40	7/11/1995	18.45	8.95	38,000	3,100	7,500	940	3,700	-
	5/10/1996	18.56	8.84	63,000	7,400	16,000	1,500	6,000	-
	10/2/1996	19.15	8.25	21,000	2,200	3,400	430	1,600	-
	2/28/1997	18.43	8.97	39,000	4,700	9,600	950	4,200	ND
	9/16/1997	19.26	8.14	29,000	3,300	5,800	690	2,900	<620
	2/5/1998	18.66	8.74	10,000	1,000	2,000	170	860	<330
	8/11/1998	18.41	8.99	12,000	1,200	2,300	260	1,400	300
	2/8/1999	19.84	7.56	5,500	740	1,200	150	780	60
	2/17/1999	18.94	8.46	-	-	-	-	-	-
	2/24/1999	20.76	6.64	-	-	-	-	-	-
	3/3/1999	18.55	8.85	-	-	-	-	-	-
	3/10/1999	20.74	6.66	-	-	-	-	-	-
	3/17/1999	18.57	8.83	-	-	-	-	-	-
	5/4/1999	18.55	8.85	90,000	9,200	21,000	1,600	10,000	560
	7/20/1999	18.98	8.42	28,000	2,100	3,700	900	4,200	<860
	10/5/1999	19.10	8.30	11,000	870	180	30	1,400	<110
	1/7/2000	19.41	7.99	15,000	1,300	2,100	440	1,800	<14
	4/6/2000	18.80	8.60	17,000	1,800	3,100	500	2,200	<50
	7/31/2000	18.87	8.53	17,000	1,500	2,700	430	2,100	<200
	10/3/2000	19.45	7.95	27,000	2,500	4,000	660	2,900	<50
	1/12/2001	19.80	7.60	25,000	2,700	4,100	670	3,000	<200
	4/11/2001	20.03	7.37	97,000	9,500	21,000	2,200	7,900	<200
	7/6/2001	20.19	7.21	3,500	500	150	11	420	<5.0
	10/25/2001	20.35	7.05	3,800	620	230	70	400	<50
	3/4/2002	20.37	7.03	46,000	7,300	12,000	870	3,200	<500
	4/18/2002	20.15	7.25	68,000	5,100	8,900	1,100	4,000	<1,000
	7/9/2002	21.09	6.31	1,000	200	8.9	0.67	82	<10
	10/4/2002	21.28	6.12	270	100	3.4	0.53	10	<5.0
	1/12/2003	20.59	6.81	67,000	7,600	13,000	1,400	5,600	<500
	4/21/2003	19.98	7.42	78,000	7,700	12,000	1,900	6,900	<500
30.40	7/21/2003	20.08	10.32	1,800	360	16	<5.0	190	<50
	10/2/2003	20.41	9.99	4,000	790	110	60	350	<50
	1/15/2004	19.93	10.47	8,100	6.1	23	44	530	<50
	4/5/2004	18.99	11.41	14,000	1,600	2,100	550	2,500	<500
	8/9/2004	19.79	10.61	1,200	210	16	14	100	<20
	10/7/2004	20.26	10.14	1,100	2.3	9.8	2.9	36	<5.0
	2/7/2005	18.80	11.60	45,000	4,400	4,800	1,400	5,800	<200
	4/5/2005	18.40	12.00	34,000	3,700	3,600	1,200	5,300	<500 (<5.0)
	7/6/2005	18.48	11.92	24,000	1,600	1,700	570	2,800	<500
	10/10/2005	19.00	11.40	25,000	1,700	2,100	710	3,200	<500
	1/26/2006	18.58	11.82	60,000	4,600	7,200	1,600	6,900	<1,000
	4/10/2006	17.84	12.56	56,000	4,900	7,500	1,200	7,400	<500
	7/6/2006	18.76	11.64	28,000	1,900	1,700	720	2,900	<500
	10/26/2006	19.60	10.80	43,000	2,800	2,500	1,700	7,600	<500
	1/19/2007	19.84	10.56	31,000	2,700	2,400	1,400	5,800	<150
	4/17/2007	19.90	10.50	37,000	3,200	2,900	1,600	6,400	<400
	7/6/2007	19.63	10.77	30,000	3,200	2,000	1,500	5,200	<250
	10/15/2007	20.11	10.29	20,000	1,200	990	650	2,300	<500
	1/17/2008	20.10	10.30	38,000	2,900	5,100	1,200	5,000	<210
	4/9/2008	20.12	10.28	51,000	3,000	6,400	1,700	6,500	<250
	7/17/2008	20.01	10.39	22,000	180	500	660	2,100	<250
	10/27/2008	20.61	9.79	26,000	570	2,100	670	3,400	<50
	1/9/2009	20.80	9.60	16,000	240	680	460	3,000	<100
	4/27/2009	20.17	10.23	16,000	130	660	570	3,600	<500
	7/9/2009	20.36	10.04	8,500	30	110	250	1,400	<100
	2/3/2010	19.84	10.56	22,000	47	140	500	3,000	<100
	7/13/2010	19.08	11.32	1,900	3.5	5.8	38	110	<5.0
	1/17/2011	19.02	11.38	17,000	23	100	330	2,200	<100
	7/12/2011	18.52	11.88	15,000	22	30	190	740	<50
	<b>1/11/2011</b>	<b>19.18</b>	<b>11.22</b>	<b>20,000</b>	<b>17</b>	<b>47</b>	<b>250</b>	<b>2,100</b>	<b>&lt;84</b>

# PANGEA

**Table 2 - Groundwater Elevation and Analytical Data.**  
Douglas Parking Company, 1721 Webster Street, Oakland, California

Boring / Well ID <i>TOC</i>	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene Xylenes MTBE		
							(µg/L)		
MW-3	12/2/1994	22.15	7.35	394,000	1,200	ND	1,800	4,000	-
29.50	3/6/1995	20.09	9.16	21,000	400	150	24	62	-
29.25	7/11/1995	19.99	9.57	12,000	ND	10	16	99	-
29.56	5/10/1996	20.24	9.32	8,600	ND	7.6	16	84	-
	10/2/1996	20.90	8.66	11,000	ND	7.4	19	92	-
	2/28/1997	20.12	9.44	6,000	ND	4.4	17	88	50
	9/16/1997	20.97	8.59	6,500	<0.5	0.69	1.2	6.7	<5.0
	2/5/1998	20.39	9.17	5,400	<0.5	6.3	15	86	<63
	8/11/1998	19.95	9.61	2,700	<0.5	3.5	3.2	12	<10
	2/8/1999	20.58	8.98	6,100	<0.5	8.1	18	80	<140
	2/17/1999	20.53	9.03	-	-	-	-	-	-
	2/24/1999	22.53	7.03	-	-	-	-	-	-
	3/3/1999	20.28	9.28	-	-	-	-	-	-
	3/10/1999	22.45	7.11	-	-	-	-	-	-
	3/17/1999	20.26	9.30	-	-	-	-	-	-
	5/4/1999	20.24	9.32	11,000	<2	<2	9.8	140	<10
	7/20/1999	20.68	8.88	11,000	<0.5	3.1	13	88	<80
	10/5/1999	20.81	8.75	31,000	62	<0.5	21	170	<90
	1/7/2000	21.09	8.47	13,000	<0.5	<2	21	140	<80
	4/6/2000	20.48	9.08	5,300	1.5	1.4	9.8	60	<30
	7/31/2000	20.62	8.94	7,100	3.5	1.0	12	66	<5.0
	10/3/2000	21.13	8.43	8,000	<0.5	3.3	11	70	<40
	1/12/2001	21.45	8.11	11,000	4.3	6.7	11	73	<70
	4/11/2001	21.69	7.87	10,000	<0.5	<0.5	11	65	<10
	7/6/2001	21.60	7.96	13,000	5.3	1.6	11	58	<5.0
	10/25/2001	21.70	7.86	11,000	<0.5	3.0	15	70	<10
	3/4/2002	21.65	7.91	1,900	1.3	0.8	<0.5	15	<5.0
	4/18/2002	21.77	7.79	1,500	1.0	0.97	1.3	5.8	<5
	7/9/2002	22.03	7.53	13,000	6.8	5.7	13	59	<90
	10/4/2002	22.15	7.41	8,400	<10	<10	<10	42	<100
	1/12/2003	21.13	8.43	9,000	9.5	5.1	8.5	46	<90
	4/21/2003	20.63	8.93	10,000	<5.0	<5.0	8.5	32	<50
32.56	7/21/2003	20.68	11.88	9,600	<2.5	<2.5	7.4	39	48 (<1.0)
	10/2/2003	20.99	11.57	12,000	<5.0	<5.0	10	40	<90
	1/15/2004	20.74	11.82	13,000	37	41	78	930	<50
	4/5/2004	20.59	11.97	4,500	<1.7	<1.7	<1.7	12	<17
	8/9/2004	22.18	10.38	2,100	<1.0	3.7	<1.0	8.1	<10
	10/7/2004	22.79	9.77	2,400	6.5	26	7.5	89	<15
	2/7/2005	20.35	12.21	6,800	2.2	5.6	2.0	12	<30
	4/5/2005	19.95	12.61	6,100	2.3	2.6	1.3	8.3	<45 (<0.5)
	7/6/2005	19.93	12.63	4,500	<1.0	1.5	1.0	8.3	<10
	10/10/2005	20.45	12.11	3,800	0.73	<0.5	0.98	5.7	<15
	1/26/2006	20.05	12.51	5,100	<0.5	1.1	<0.5	6.6	<15
	4/10/2006	19.39	13.17	1,900	0.55	1.6	0.51	4.1	<10
	7/6/2006	20.25	12.31	5,600	<1.0	2.3	<1.0	6.4	<20
	10/26/2006	21.07	11.49	8,000	2.5	1.0	2.3	12	<35
	1/19/2007	21.38	11.18	77,000	19	40	9.5	130	<300
	4/17/2007	21.45	11.11	7,400	2.7	6.6	1.1	12	<40
	7/6/2007	21.29	11.27	7,100	2.4	5.6	0.85	10	<30
	10/15/2007	21.62	10.94	10,000	<5.0	<5.0	<5.0	14	<50
	1/17/2008	21.68	10.88	6,400	1.8	<0.5	1.0	8.4	23
	4/9/2008	21.42	11.14	4,700	1.7	2.2	<0.5	3.8	<18
	7/17/2008	22.10	10.46	7,700	2.9	3.1	1.4	11	<60
	10/27/2008	22.13	10.43	9,700	<1.7	1.8	2.3	11	<17
	1/9/2009	22.27	10.29	9,800	1.7	2.0	3.0	14	<17
	4/27/2009	21.74	10.82	8,700	1.9	3.3	<1.7	11	<50
	7/9/2009	21.92	10.64	10,000	<2.5	4.1	2.6	11	<60
	2/3/2010	21.55	11.01	5,300	1.5	2.3	<0.5	2.7	<25
	7/13/2010	21.31	11.25	4,400	<2.5	9.0	<2.5	4.6	<25
	1/17/2011	20.75	11.81	4,100	1.2	1.8	<0.5	2.7	<20
	7/12/2011	20.14	12.42	4,500	2.4	2.8	<0.5	5.0	<25
	<b>1/11/2012</b>	<b>20.80</b>	<b>11.76</b>	<b>3,000</b>	<b>1.1</b>	<b>1.6</b>	<b>&lt;0.5</b>	<b>1.9</b>	<b>&lt;15</b>

# PANGEA

**Table 2 - Groundwater Elevation and Analytical Data.**  
Douglas Parking Company, 1721 Webster Street, Oakland, California

Boring / Well ID TOC	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene Xylenes MTBE		
							(µg/L)		
MW-4 25.29	5/10/1996	16.98	8.31	14,000	ND	1,200	720	3,100	-
	10/2/1996	17.65	7.64	12,000	ND	650	580	2,200	-
	2/28/1997	16.80	8.49	13,000	ND	1,100	750	2,700	110
	9/17/1997	17.93	7.36	13,000	<2.5	820	750	2,900	<190
	2/5/1998	16.78	8.51	13,000	<1.0	690	690	2,900	<170
	8/11/1998	16.59	8.70	15,000	<5	360	520	1,900	280
	2/8/1999	17.10	8.19	9,800	<5	680	770	2,200	300
	2/24/1999	18.95	6.34	-	-	-	-	-	-
	3/3/1999	16.80	8.49	-	-	-	-	-	-
	3/10/1999	16.86	8.43	-	-	-	-	-	-
	3/17/1999	16.82	8.47	-	-	-	-	-	-
	5/4/1999	16.86	8.43	11,000	46	600	620	1,900	<100
	7/20/1999	17.30	7.99	13,000	<0.5	470	7.0	2,000	<150
	10/5/1999	17.43	7.86	18,000	4.4	720	800	2,100	<120
	1/7/2000	17.78	7.51	18,000	<2	930	990	2,700	<30
	4/6/2000	17.17	8.12	8,000	31	390	530	1,300	<10
	7/31/2000	17.21	8.08	6,200	13	170	460	850	<10
	10/3/2000	18.00	7.29	14,000	42	820	730	2,000	<50
	1/12/2001	18.20	7.09	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/11/2001	18.31	6.98	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2001	18.35	6.94	470	2.3	1.6	0.81	43	<5.0
	10/25/2001	18.47	6.82	110	0.70	<0.5	<0.5	3.3	<5.0
	3/4/2002	18.43	6.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/18/2002	18.61	6.68	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/9/2002	19.50	5.79	<50	<0.5	<0.5	<0.5	<0.5	<5.0
10/4/2002	19.83	5.46	310	2.0	2.9	13	16	<0.5	
1/12/2003	19.07	6.22	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
4/21/2003	18.71	6.58	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
28.29	7/21/2003	18.81	9.48	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/2/2003	19.02	9.27	59	0.78	<0.5	1.1	0.91	<5.0
	1/15/2004	18.68	9.61	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2004	17.41	10.88	6,200	29	250	450	730	<100
	8/9/2004	19.07	9.22	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/7/2004	19.65	8.64	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	2/7/2005	17.21	11.08	8,700	48	340	550	720	<100
	4/5/2005	16.78	11.51	6,900	27	290	520	660	<170 (<0.5)
	7/6/2005	16.98	11.31	5,600	<5.0	130	470	480	<50
	10/10/2005	17.59	10.70	6,300	23	78	530	430	<50
	1/26/2006	17.08	11.21	5,600	41	68	400	290	<120
	4/10/2006	16.27	12.02	2,900	39	32	200	140	<60
	7/6/2006	17.20	11.09	5,400	65	59	340	150	<120
	10/26/2006	18.06	10.23	7,200	72	46	460	200	<150
	1/19/2007	18.29	10.00	7,100	140	35	520	150	<200
	4/17/2007	18.30	9.99	4,900	90	32	290	89	<110
	7/6/2007	18.00	10.29	4,600	91	30	210	55	<90
	10/15/2007	18.52	9.77	8,600	200	62	480	110	<210
	1/17/2008	18.46	9.83	820	15	3.7	25	9.3	<10
	4/9/2008	18.23	10.06	3,600	55	20	160	64	<60
	7/17/2008	18.72	9.57	6,500	210	47	510	180	<180
	10/27/2008	19.07	9.22	7,700	200	28	450	87	<150
	1/9/2009	19.12	9.17	4,400	180	34	180	93	<150
	4/27/2009	18.52	9.77	2,500	110	24	190	69	<150
	7/9/2009	18.78	9.51	5,600	150	34	270	83	<250
2/3/2010	18.24	10.05	2,900	38	20	69	54	<50	
7/13/2010	17.59	10.70	1,100	20	7.6	43	26	<60	
1/17/2011	17.42	10.87	2,900	16	43	60	99	<15	
7/12/2011	17.01	11.28	<50	<0.5	0.56	0.52	0.93	<5.0	
	<b>1/11/2012</b>	<b>17.68</b>	<b>10.61</b>	<b>4,100</b>	<b>52</b>	<b>52</b>	<b>49</b>	<b>130</b>	<b>&lt;90</b>
MW-5 21.97	5/10/1996	14.60	7.37	ND	ND	ND	ND	ND	-
	10/2/1996	15.25	6.72	ND	ND	ND	ND	ND	-
	2/28/1997	14.31	7.66	ND	ND	ND	ND	ND	ND
	9/17/1997	15.18	6.79	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0
	2/5/1998	13.64	8.33	<50	<0.5	<0.5	<0.5	<0.5	<5.0

# PANGEA

**Table 2 - Groundwater Elevation and Analytical Data.**  
Douglas Parking Company, 1721 Webster Street, Oakland, California

Boring / Well ID TOC	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene Xylenes MTBE			
							(µg/L)			
MW-5 (cont.)	8/11/1998	13.92	8.05	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	2/8/1999	14.19	7.78	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	2/24/1999	16.18	5.79	-	-	-	-	-	-	
	3/3/1999	14.23	7.74	-	-	-	-	-	-	
	3/10/1999	14.32	7.65	-	-	-	-	-	-	
	3/17/1999	14.25	7.72	-	-	-	-	-	-	
	5/4/1999	14.41	7.56	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	7/20/1999	14.44	7.53	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	10/5/1999	14.79	7.18	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	1/7/2000*	15.23	6.74	-	-	-	-	-	-	
	4/6/2000	14.74	7.23	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	7/31/2000	14.52	7.45	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	10/3/2000	15.37	6.60	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	1/12/2001	15.70	6.27	6,400	13	290	450	1,100	<40	
	4/11/2001	15.78	6.19	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	7/6/2001	15.97	6.00	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	10/25/2001	16.05	5.92	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	3/4/2002	16.21	5.76	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	4/18/2002	16.59	5.38	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	7/9/2002	16.94	5.03	170	1.0	0.65	2.1	4.0	<15	
	10/4/2002	17.14	4.83	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	1/12/2003	16.58	5.39	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	4/21/2003	15.90	6.07	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	7/21/2003	16.03	8.96	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	24.99	10/2/2003	16.33	8.66	<50	<0.5	<0.5	<0.5	<0.5	<5.0
		1/15/2004	16.21	8.78	<50	<0.5	<0.5	<0.5	<0.5	<5.0
		4/5/2004	15.01	9.98	<50	<0.5	<0.5	<0.5	<0.5	<5.0
		8/9/2004	16.85	8.14	<50	<0.5	<0.5	<0.5	<0.5	<5.0
		10/7/2004	17.48	7.51	<50	<0.5	<0.5	<0.5	<0.5	<5.0
		2/7/2005	16.52	8.47	<50	<0.5	<0.5	<0.5	<0.5	<5.0
		4/5/2005	14.45	10.54	<50	<0.5	<0.5	<0.5	<0.5	<5.0 (<0.5)
		7/6/2005	14.85	10.14	<50	<0.5	<0.5	<0.5	<0.5	<5.0
		10/10/2005	15.44	9.55	<50	<0.5	<0.5	<0.5	<0.5	<5.0
1/26/2006		14.96	10.03	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
4/10/2006		14.01	10.98	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
7/6/2006		15.17	9.82	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
10/26/2006		15.94	9.05	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
1/19/2007		16.05	8.94	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
4/17/2007		15.99	9.00	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
7/6/2007		15.50	9.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
10/15/2007		16.27	8.72	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
1/17/2008		15.10	9.89	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
4/9/2008		15.96	9.03	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
7/17/2008		16.44	8.55	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
10/27/2008		16.78	8.21	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
1/9/2009		16.75	8.24	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
4/27/2009		16.21	8.78	--	--	--	--	--	--	
7/9/2009		16.48	8.51	--	--	--	--	--	--	
2/3/2010		15.77	9.22	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
7/13/2010		15.34	9.65	---	---	---	---	---	---	
1/17/2011		14.93	10.06	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
7/12/2011	14.81	10.18	--	--	--	--	--	--		
<b>1/11/2012</b>	<b>15.44</b>	<b>9.55</b>	<b>&lt;50</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;5.0</b>		
MW-6 30.99	6/30/2003	19.60	11.39	68,000	950	6,000	2,400	10,000	<1,000	
	7/21/2003	19.67	11.32	120,000	170	1,400	1,100	10,000	<1,000	
	10/2/2003	19.97	11.02	16,000	7.6	200	38	1,800	<100	
	1/15/2004	19.55	11.44	14,000	48	51	94	1,100	<50	
	4/5/2004	19.17	11.82	24,000	180	900	430	1,800	<500	
	8/9/2004	20.98	10.01	5,300	6.4	25	5.3	69	<17 (<0.5)	
	10/7/2004	21.52	9.47	5,600	11	58	18	210	<50 (<0.5)	
	2/7/2005	19.00	11.99	31,000	120	620	310	1,200	<500	
	4/5/2005	18.60	12.39	21,000	170	1,100	350	1,300	<500 (<5.0)	
	7/6/2005	18.56	12.43	26,000	130	920	320	1,200	<500	

# PANGEA

**Table 2 - Groundwater Elevation and Analytical Data.**  
Douglas Parking Company, 1721 Webster Street, Oakland, California

Boring / Well ID TOC	Date	Depth to Water (ft)	Groundwater Elevation (ft amsl)	TPHg	Benzene	Toluene	Ethylbenzene Xylenes MTBE		
							(µg/L)		
MW-6 (cont.)	10/10/2005	19.99	11.00	19,000	140	840	250	980	<500
	1/26/2006	18.70	12.29	10,000	140	1,100	270	1,200	<170
	4/10/2006	18.04	12.95	13,000	140	1,000	280	1,000	<250
	7/6/2006	18.80	12.19	17,000	150	1,000	290	1,000	<250
	10/26/2006	19.62	11.37	23,000	230	660	470	1,500	<500
	1/19/2007	19.92	11.07	18,000	190	620	350	1,100	<150
	4/17/2007	19.97	11.02	23,000	380	1,400	590	2,000	<450
	7/6/2007	19.81	11.18	28,000	600	3,000	900	2,700	<500
	10/15/2007	20.15	10.84	25,000	290	680	410	1,100	<250
	10/15/2007	20.15	10.84	25,000	290	680	410	1,100	<250
	1/17/2007	20.22	10.77	16,000	200	130	130	460	<150
	4/9/2008	19.86	11.13	18,000	320	870	480	1,500	<250
	7/17/2008	20.36	10.63	18,000	320	510	420	1,200	<500
	10/27/2008	20.69	10.30	31,000	320	320	410	990	<350
	1/9/2009	20.83	10.16	22,000	340	390	560	1,400	<250
	4/27/2009	20.27	10.72	13,000	110	97	380	1,100	<350
	7/9/2009	20.43	10.56	18,000	250	520	470	1,300	<450
	2/3/2010	20.14	10.85	6,200	82	180	190	550	<150
	7/13/2010	19.29	11.70	12,000	260	420	480	1,600	<450
	1/17/2011	19.31	11.68	4,900	70	52	210	500	<50
7/12/2011	18.73	12.26	1,400	20	8.5	64	130	<30	
	<b>1/11/2012</b>	<b>19.39</b>	<b>11.60</b>	<b>6,000</b>	<b>100</b>	<b>38</b>	<b>310</b>	<b>700</b>	<b>&lt;210</b>
MW-7 33.11	6/30/2003	21.40	11.71	170	<0.5	2.1	2.0	8.7	<5.0
	7/21/2003	21.44	11.67	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/2/2003	21.73	11.38	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/15/2004	21.57	11.54	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2004	20.84	12.27	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	8/9/2004	22.68	10.43	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/7/2004	23.27	9.84	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	2/7/2005	20.60	12.51	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/5/2005	20.22	12.89	<50	<0.5	0.75	<0.5	<0.5	<5.0 (<0.5)
	7/6/2005	20.25	12.86	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/10/2005	20.70	12.41	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/26/2006	20.32	12.79	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/10/2006	19.62	13.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2006	20.47	12.64	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/26/2006	21.30	11.81	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/19/2007	21.62	11.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/17/2007		11.49	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2007	21.59	11.52	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/15/2007	21.85	11.26	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/17/2007	21.90	11.21	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/9/2008	21.61	11.50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/17/2008	22.09	11.02	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/27/2008	22.39	10.72	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	1/9/2009	22.52	10.59	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/27/2009	21.98	11.13	--	--	--	--	--	--
	7/9/2009	22.18	10.93	--	--	--	--	--	--
	2/3/2010	21.87	11.24	<50	<0.5	<0.5	<0.5	<0.5	<5.0
7/13/2010	21.01	12.10	---	---	---	---	---	---	
1/17/2011	21.07	12.04	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
7/12/2011	20.72	12.39	<50	<0.5	<0.5	<0.5	<0.5	<5.0	
	<b>1/11/2012</b>	<b>21.13</b>	<b>11.98</b>	<b>&lt;50</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;5.0</b>
AS-1	7/6/2006	19.53	--	18,000	2,700	570	700	1,900	<500
	10/26/2006	20.33	--	15,000	1,900	340	360	1,400	<250
	1/19/2007	20.64	--	5,700	1,100	110	88	630	<50
	1/19/2007	20.64	--	5,700	1,100	110	88	630	<50
	4/17/2007	20.71	--	--	--	--	--	--	--
	7/16/2007	--	--	--	--	--	--	--	--
	10/15/2007	--	--	--	--	--	--	--	--
	1/17/2008	--	--	--	--	--	--	--	--





**Table 3. SVE/AS System Performance Summary - 1721 Webster Street, Oakland, California**

Date	Sample ID	FIELD MEASUREMENTS				ANALYTICAL RESULTS		REMOVAL				Air Sparge Unit on? (yes/no)	Comments
		Hour Meter Reading (hours)	System Vapor Flow Rate (cfm)	Applied Vacuum ("H2O)	FID Reading (ppm)	TPHg Lab Data (ppmv)	Benzene Lab Data (ppmv)	SVE TPHg Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE Benzene Removal (lbs)		
10/29/07	N/A	1.0	0	0	0	0	0	0	0	0	0	no	System start up
10/29/07	SYS-INF SYS-MID SYS-EFF	1.5	104	68	3,400 8 0	9,600 23 27	76 ND<0.077 0.15	320.3	6.7	2.30	0.05	no	
10/30/07	SYS-INF SYS-MID SYS-EFF	24.3	50	27	37,000 635 700	9,000 ND<7.0 60	74 ND<0.077 0.29	144.4	143.8	1.08	1.07	no	Readings upon arrival
10/30/07	SYS-INF SYS-MID SYS-EFF	25.2	45	27	3,200 620 530	1,500 ND<7.0 ND<7.0	11 ND<0.077 ND<0.077	21.7	144.6	0.14	1.08	no	Readings after dilution air introduced to reduce noise and limit hydrocarocarbon loading on carbon (prevent thermal
10/31/07	SYS-INF SYS-MID SYS-EFF	48.8	40	27	922* 0* 0*	880 ND<7.0 ND<7.0	8.6 ND<0.077 ND<0.077	11.3	155.7	0.10	1.17	no	Dilution airflow set at ~25% of total flow
11/01/07	SYS-INF SYS-MID SYS-EFF	78.8	39	27	1,475 14 9	--- --- ---	---	11.0	169.5	0.10	1.30	no	
11/02/07	SYS-INF SYS-MID SYS-EFF	100.2	40	27	736 19 10	--- --- ---	---	11.3	179.6	0.10	1.39	no	Shut system down at 100.5 hours for weekend
11/05/07	SYS-INF SYS-MID SYS-EFF	100.9	38	27	1,546 30 4	--- --- ---	---	10.7	179.9	0.10	1.39	no	Restart system at 100.5 hours on 11/5/07
11/06/07	SYS-INF SYS-MID SYS-EFF	126.7	38	27	213 0 0	--- --- ---	---	10.7	191.4	0.10	1.49	no	
11/07/07	SYS-INF SYS-MID SYS-EFF	154.7	45	27	170 0 0	--- --- ---	---	12.7	206.2	0.11	1.62	no	
11/08/07	SYS-INF SYS-MID SYS-EFF	178.2	47	27	160 0 0	--- --- ---	---	13.3	219.2	0.12	1.74	no	Lab analysis performed for methane; 2.4 u/L detected in SYS EFF
11/09/07	SYS-INF SYS-MID SYS-EFF	200.3	45	31	163 0 0	--- --- ---	---	12.7	230.9	0.11	1.84	no	Shut system down at 200.3 hours for weekend
11/12/07	SYS-INF SYS-MID SYS-EFF	206.3	42	28	211 0 2	--- --- ---	---	11.9	233.9	0.11	1.87	yes	Restart system at 200.3 hours on 11/12/07; start air sparge system
11/13/07	SYS-INF SYS-MID SYS-EFF	225.6	46	28	2,937 0 4	--- --- ---	---	13.0	244.3	0.12	1.96	yes	

**Table 3. SVE/AS System Performance Summary - 1721 Webster Street, Oakland, California**

Date	Sample ID	FIELD MEASUREMENTS				ANALYTICAL RESULTS		REMOVAL				Air Sparge Unit on? (yes/no)	Comments
		Hour Meter Reading (hours)	System Vapor Flow Rate (cfm)	Applied Vacuum ("H2O)	FID Reading (ppm)	TPHg Lab Data (ppmv)	Benzene Lab Data (ppmv)	SVE TPHg Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE Benzene Removal (lbs)		
11/14/07	SYS-INF SYS-MID SYS-EFF	253.0	45	28	4,113 0 0	---	---	12.7	258.9	0.11	2.09	yes	
11/15/07	SYS-INF SYS-MID SYS-EFF	278.4	45	28	2,810 0 0	---	---	12.7	272.3	0.11	2.21	yes	
11/16/07	SYS-INF SYS-MID SYS-EFF	301.4	43	28	2,570 0 0	---	---	12.1	283.9	0.11	2.31	yes	
11/17/07	SYS-INF SYS-MID SYS-EFF	327.1	42	41	11 0 0	---	---	11.9	296.6	0.11	2.42	yes	
11/18/07	SYS-INF SYS-MID SYS-EFF	352.1	44	41	530 0 0	---	---	12.4	309.6	0.11	2.54	yes	
11/19/07	SYS-INF SYS-MID SYS-EFF	375.2	42	41	24 0 0	22 ---	<0.077 ---	0.3	309.9	0.00	2.54	yes	
11/20/07	SYS-INF SYS-MID SYS-EFF	398.8	49	68	660 0 0	---	---	0.3	310.2	0.00	2.54	yes	Increased system vacuum by closing off recirculation valve on blower.
11/26/07	SYS-INF SYS-MID SYS-EFF	426.3	49	68	1,800 0 0	---	---	0.3	310.6	0.00	2.54	yes	Received verbal approval from BAAQMD to decrease monitoring from daily to weekly.
12/03/07	SYS-INF SYS-MID SYS-EFF	593.5	48	61	1,300 0 0	---	---	0.3	313.0	0.00	2.54	yes	
12/14/07	SYS-INF SYS-MID SYS-EFF	853.0	52	54	280 0 0	280 <7.0 <7.0	0.17 <0.077 <0.077	4.7	363.5	0.003	2.57	yes	
12/21/07	SYS-INF SYS-MID SYS-EFF	1,021.5	58	54	0 0 0	170 <7.0 <7.0	0.14 <0.077 <0.077	3.2	385.7	0.00	2.58	yes	SVE shutdown after reading, restarted
12/27/07	SYS-INF SYS-MID SYS-EFF	1,163.5	40	54	NM NM NM	---	---	2.2	398.6	0.00	2.59	yes	SVE shutdown on arrival, restart and monitor
12/28/07	SYS-INF SYS-MID SYS-EFF	1,188.5	50	54	14 0 0	14 <7.0 <7.0	<0.077 <0.077 <0.077	0.2	398.8	0.00	2.59	yes	
01/03/08	SYS-INF SYS-MID SYS-EFF	1,329.5	51	54	50 0 0	50 15 <7.0	<0.077 <0.077 <0.077	0.8	403.6	0.00	2.59	yes	

Table 3. SVE/AS System Performance Summary - 1721 Webster Street, Oakland, California													
Date	Sample ID	FIELD MEASUREMENTS				ANALYTICAL RESULTS		REMOVAL				Air Sparge Unit on? (yes/no)	Comments
		Hour Meter Reading (hours)	System Vapor Flow Rate (cfm)	Applied Vacuum ("H2O)	FID Reading (ppm)	TPHg Lab Data (ppmv)	Benzene Lab Data (ppmv)	SVE TPHg Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE Benzene Removal (lbs)		
01/10/08	SYS-INF SYS-MID SYS-EFF	1,430.2	50	54	0	16 13 <7.0	<0.077 <0.077 <0.077	0.3	404.7	0.00	2.59	no	AS system off while sampling
1/15/2008*	SYS-INF SYS-MID SYS-EFF	1,546.0	50	81	--	1,200 7.7 <7.0	2.1 <0.077 <0.077	19.2	497.6	0.03	2.74	yes	
1/23/2008*	SYS-INF SYS-MID SYS-EFF	1,694.5	50	95	--	1,300 11 <7.0	1.6 <0.077 <0.077	20.9	626.6	0.02	2.88	yes	
01/30/08	SYS-INF SYS-MID SYS-EFF	1,864.6	49	81	--	2,300 24 <7.0	2.6 <0.077 <0.077	36.2	882.9	0.04	3.15	yes	
02/06/08	SYS-INF SYS-MID SYS-EFF	2,027.5	50	81	--	1,700 43 <7.0	2.9 <0.077 <0.077	27.3	1,068.0	0.04	3.43	yes	
02/12/08	SYS-INF SYS-MID SYS-EFF	2,173.3	60	95	--	1,500 520 28	1.7 1.1 <0.077	28.9	1,243.4	0.03	3.61	yes	
02/21/08	SYS-INF SYS-MID SYS-EFF	2,394.1	65	95	--	---	---	31.3	1,531.2	0.03	3.91	yes	Samples not picked up by the laboratory courier before hold time expired.
02/29/08	SYS-INF SYS-MID SYS-EFF	2,580.5	27	95	--	1,100 890 <7.0	1.4 5.3 <0.077	9.5	1,605.2	0.01	3.99	yes	System shut down for future changeout of carbon in first vessel.
04/07/08	SYS-INF SYS-MID SYS-EFF	2,581.4	44	7.5	--	1,100 ---	1.4 ---	15.5	1,605.8	0.02	3.99	yes	Restart system after carbon changeout
04/10/08	SYS-INF SYS-MID SYS-EFF	2,650.3	26	7	--	1,200 <7.0 <7.0	3.6 <0.077 <0.077	10.0	1,634.5	0.03	4.07	yes	
04/17/08	SYS-INF SYS-MID SYS-EFF	2,826.1	28	8	962 3 3	---	---	10.8	1,713.5	0.03	4.29	yes	
04/23/08	SYS-INF SYS-MID SYS-EFF	2,969.4	26	7.5	--	1,100 <7.0 <7.0	1.5 <0.077 <0.077	9.2	1,768.2	0.01	4.36	yes	
04/30/08	SYS-INF SYS-MID SYS-EFF	3,136.8	23	7.5	--	780 <7.0 <7.0	1.4 <0.077 <0.077	5.8	1,808.4	0.01	4.42	yes	
05/07/08	SYS-INF SYS-MID SYS-EFF	3,304.6	28	8	378 0 0	---	---	7.0	1,857.4	0.01	4.50	yes	

Table 3. SVE/AS System Performance Summary - 1721 Webster Street, Oakland, California														
Date	Sample ID	FIELD MEASUREMENTS				ANALYTICAL RESULTS		REMOVAL				Air Sparge Unit on? (yes/no)	Comments	
		Hour Meter Reading (hours)	System Vapor Flow Rate (cfm)	Applied Vacuum ("H2O)	FID Reading (ppm)	TPHg Lab Data (ppmv)	Benzene Lab Data (ppmv)	SVE TPHg Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE Benzene Removal (lbs)			
05/14/08	SYS-INF SYS-MID SYS-EFF	3,472.2	26	8	523 6 0	--- --- ---	---	---	6.5	1,902.8	0.01	4.57	yes	
05/23/08	SYS-INF SYS-MID SYS-EFF	3,690.2	28	7	264 0 0	--- --- ---	---	---	7.0	1,966.5	0.01	4.68	yes	
05/30/08	SYS-INF SYS-MID SYS-EFF	3,859.2	36	7	317 1 0	--- --- ---	---	---	9.0	2,029.9	0.01	4.78	yes	
06/05/08	SYS-INF SYS-MID SYS-EFF	3,999.6	38	7	350 0 0	--- --- ---	---	---	9.5	2,085.5	0.02	4.87	yes	
06/13/08	SYS-INF SYS-MID SYS-EFF	4,193.1	38	7	-- -- 0	700 <7.0 <7.0	1.6 <0.077 <0.077	---	8.5	2,154.3	0.02	5.01	yes	
06/19/08	SYS-INF SYS-MID SYS-EFF	4336.7	25	7	349 -- 0	--- --- ---	---	---	5.6	2,187.9	0.01	5.08	yes	
06/27/08	SYS-INF SYS-MID SYS-EFF	4,529.7	25	7	335 0 0	--- --- ---	---	---	5.6	2,233.1	0.01	5.18	yes	
07/10/08	SYS-INF SYS-MID SYS-EFF	4,839.0	56	8	256 40 0	--- --- ---	---	---	12.6	2,395.2	0.03	5.51	yes	
07/18/08	SYS-INF SYS-MID SYS-EFF	5,032.0	33	8	330 174 0	--- --- ---	---	---	7.4	2,454.8	0.02	5.64	yes	
7/24/2008**	SYS-INF SYS-MID SYS-EFF	5,178.0	33	8	360 187 0	--- --- ---	---	---	7.4	2,499.8	0.02	5.73	yes	
8/1/2008**	SYS-INF SYS-MID SYS-EFF	5,368.0	33	8	248 193 0	--- --- ---	---	---	7.4	2,558.5	0.02	5.85	yes	Lowered motor speed of blower to reduce noise within garage per client
8/8/2008**	SYS-INF SYS-MID SYS-EFF	5,536.7	17	4.5	146 153 0	--- --- ---	---	---	3.8	2,585.3	0.01	5.91	yes	Stopped air sparging to wells AS-1 & AS-3. Sparging in well AS-2 full time.
8/18/2008**	SYS-INF SYS-MID SYS-EFF	5,774.1	17	4.5	365 170 0	840 140 <7.0	1.1 <0.077 <0.077	---	4.6	2,630.7	0.01	5.96	yes	
08/22/08	SYS-INF SYS-MID SYS-EFF	5,873.9	17	4	325 207 0	--- --- ---	---	---	4.6	2,649.7	0.01	5.98	yes	

**Table 3. SVE/AS System Performance Summary - 1721 Webster Street, Oakland, California**

Date	Sample ID	FIELD MEASUREMENTS				ANALYTICAL RESULTS		REMOVAL				Air Sparge Unit on? (yes/no)	Comments
		Hour Meter Reading (hours)	System Vapor Flow Rate (cfm)	Applied Vacuum ("H2O)	FID Reading (ppm)	TPHg Lab Data (ppmv)	Benzene Lab Data (ppmv)	SVE TPHg Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE Benzene Removal (lbs)		
09/05/08	SYS-INF SYS-MID SYS-EFF	6,208.4	14	5	385 219 23	---	---	3.6	2,700.4	0.004	6.05	yes	System shutdown for carbon changeout
10/06/08	SYS-INF SYS-MID SYS-EFF	6,211.0	13	5	443 23 0	1,000 ---	1.8 ---	3.4	2,700.8	0.004	6.05	yes	System restarted; samples collected after system ran for approximately 1
10/14/08	SYS-INF SYS-MID SYS-EFF	6,405.0	15	5	215 0 0	---	---	4.7	2,738.4	0.00	6.05	yes	
10/23/08	SYS-INF SYS-MID SYS-EFF	6,615.7	14	5	205 0 0	---	---	4.5	2,777.8	0.01	6.11	yes	
10/29/08	SYS-INF SYS-MID SYS-EFF	6,760.3	21	5	160 0 0	---	---	6.6	2,817.5	0.01	6.17	yes	
11/17/08	SYS-INF SYS-MID SYS-EFF	7,221.4	20	5	98 0 0	---	---	6.3	2,937.6	0.01	6.37	yes	
11/25/08	SYS-INF SYS-MID SYS-EFF	7,413.9	19	5	24 0 0	---	---	6.1	2,986.5	0.01	6.45	yes	
12/05/08	SYS-INF SYS-MID SYS-EFF	7,652.3	15	5	74 0 0	---	---	4.8	3,034.3	0.01	6.53	yes	Shutdown system to conduct maintenance on blower. Greased fittings and lowered motor speed at
12/16/08	SYS-INF SYS-MID SYS-EFF	7,915.0	15	5	21 0 0	77 ---	<0.077 ---	0.4	3,038.4	0.00	6.53	yes	
12/23/08	SYS-INF SYS-MID SYS-EFF	8,079.4	20	5	22 0 0	---	---	0.5	3,041.7	0.00	6.53	yes	
12/31/08	SYS-INF SYS-MID SYS-EFF	8,277.1	30	5	24 0 0	---	---	0.7	3,047.8	0.00	6.53	yes	
01/06/09	SYS-INF SYS-MID SYS-EFF	8,416.9	27	5	28 0 0	---	---	0.7	3,051.6	0.00	6.53	yes	Greased blower
01/20/09	SYS-INF SYS-MID SYS-EFF	8,756.6	27	5	NM	---	---	0.7	3,061.1	0.00	6.53	yes	Shutdown system to evaluate effectiveness of remediation on groundwater.
02/06/09	SYS-INF SYS-MID SYS-EFF	8,756.6	25	5	50 0 0	50 ---	<0.077 ---	0.4	3,061.1	0.00	6.53	yes	Restart system



**Table 3. SVE/AS System Performance Summary - 1721 Webster Street, Oakland, California**

Date	Sample ID	FIELD MEASUREMENTS				ANALYTICAL RESULTS		REMOVAL				Air Sparge Unit on? (yes/no)	Comments
		Hour Meter Reading (hours)	System Vapor Flow Rate (cfm)	Applied Vacuum ("H2O)	FID Reading (ppm)	TPHg Lab Data (ppmv)	Benzene Lab Data (ppmv)	SVE TPHg Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE Benzene Removal (lbs)		
02/26/09	SYS-INF SYS-MID SYS-EFF	9,002.6	22	5	13 1 0	--- --- ---	--- --- ---	0.3	3,064.6	0.00	6.53	yes	Restart system, off on arrival
03/06/09	SYS-INF SYS-MID SYS-EFF	9,197.4	23	5	5 0 0	--- --- ---	--- --- ---	0.4	3,067.6	0.00	6.53	yes	
03/13/09	SYS-INF SYS-MID SYS-EFF	9,360.4	22	5	NM NM NM	20 <7.0 <7.0	<0.077 <0.077 <0.077	0.1	3,068.5	0.00	6.53	yes	
03/18/09	SYS-INF SYS-MID SYS-EFF	9,480.4	21	5	5 0 0	--- --- ---	--- --- ---	0.1	3,069.2	0.00	6.53	yes	
03/26/09	SYS-INF SYS-MID SYS-EFF	9,675.1	21	5	5 0 0	--- --- ---	--- --- ---	0.1	3,070.3	0.00	6.53	yes	
04/03/09	SYS-INF SYS-MID SYS-EFF	9,868.7	21	5	4 0 0	--- --- ---	--- --- ---	0.1	3,071.4	0.00	6.53	yes	
04/10/09	SYS-INF SYS-MID SYS-EFF	10,035.7	22	5	1 0 0	--- --- ---	--- --- ---	0.1	3,072.4	0.00	6.53	yes	
04/17/09	SYS-INF SYS-MID SYS-EFF	10,203.7	21	5	4 0 0	--- --- ---	--- --- ---	0.1	3,073.3	0.00	6.53	yes	
04/24/09	SYS-INF SYS-MID SYS-EFF	10,366.7	19	5	4 0 0	--- --- ---	--- --- ---	0.1	3,074.2	0.00	6.53	yes	Shut AS/SVE off for upcoming QM
05/01/09	SYS-INF SYS-MID SYS-EFF	10,366.7	20	5	3 0 0	--- --- ---	--- --- ---	0.1	3,074.2	0.00	6.53	yes	Restart SVE/AS
05/08/09	SYS-INF SYS-MID SYS-EFF	10,543.3	21	5	15 0 0	--- --- ---	--- --- ---	0.1	3,075.1	0.00	6.53	yes	
05/15/09	SYS-INF SYS-MID SYS-EFF	10,711.8	20	5	32 0 0	--- --- ---	--- --- ---	0.1	3,076.0	0.00	6.53	yes	
05/22/09	SYS-INF SYS-MID SYS-EFF	10,879.5	0	0	NM NM NM	--- --- ---	--- --- ---	0.0	3,076.0	0.00	6.53	no	AS compressor down; shut SVE off
09/18/09	SYS-INF SYS-MID SYS-EFF	10,879.5	22	5	41 0 0	--- --- ---	--- --- ---	0.1	3,076.0	0.00	6.53	yes	Restart AS and SVE after repairing AS comp
10/30/09	SYS-INF SYS-MID SYS-EFF	11,889.8	20	5	35 0 0	--- --- ---	--- --- ---	0.1	3,081.5	0.00	6.53	no	SVE on, AS comp has blown fuse
11/30/09	SYS-INF SYS-MID SYS-EFF	12,631.8	20	5	31 0 0	--- --- ---	--- --- ---	0.1	3,085.4	0.00	6.53	yes	Replace fuse, restart AS

**Table 3. SVE/AS System Performance Summary - 1721 Webster Street, Oakland, California**

Date	Sample ID	FIELD MEASUREMENTS				ANALYTICAL RESULTS		REMOVAL				Air Sparge Unit on? (yes/no)	Comments
		Hour Meter Reading (hours)	System Vapor Flow Rate (cfm)	Applied Vacuum ("H2O)	FID Reading (ppm)	TPHg Lab Data (ppmv)	Benzene Lab Data (ppmv)	SVE TPHg Removal Rate (lbs/day)	Cumulative SVE TPHg Removal (lbs)	SVE Benzene Removal Rate (lbs/day)	Cumulative SVE Benzene Removal (lbs)		
12/16/09	SYS-INF SYS-MID SYS-EFF	13,017.6	22	5	22 0 0	---	---	0.1	3,087.7	0.00	6.53	yes	
01/18/10	SYS-INF SYS-MID SYS-EFF	13,808.6	24	5	27 0 0	---	---	0.2	3,092.8	0.00	6.53	yes	
02/03/10	SYS-INF SYS-MID SYS-EFF	14,193.0	12	4	34 0 0	72 <7.0 <7.0	0.25 <0.077 <0.077	0.3	3,097.2	0.00	6.53	yes	Serviced SVE blower, collected lab samples
04/07/10	SYS-INF SYS-MID SYS-EFF	15,701.1	12	5	45 0 0	---	---	0.3	3,114.6	0.00	6.58	no	AS off, compressor non-op
05/07/10	SYS-INF SYS-MID SYS-EFF	16,425.2	27	0	43 0 0	---	---	0.6	3,133.4	0.00	6.64	no	AS off, compressor non-op
06/07/10	SYS-INF SYS-MID SYS-EFF	17,168.0	27	0	46 0 0	84 <7.0 <7.0	0.29 <0.077 <0.077	0.7	3,155.5	0.00	6.71	no	AS off, compressor non-op
07/15/10	SYS-INF SYS-MID SYS-EFF	18,075.8	23	0	4 2 0	---	---	0.6	3,179.1	0.00	6.79	no	AS off, compressor non-op
08/18/10	SYS-INF SYS-MID SYS-EFF	18,434.1	30	0	26 2 0	---	---	0.8	3,191.3	0.00	6.82	no	Restart system, off on arrival
09/22/10	SYS-INF SYS-MID SYS-EFF	19,173.6	25	0	17 2 0	66 <7.0 <7.0	0.21 <0.077 <0.077	0.5	3,208.0	0.00	6.87	no	Restart system, off on arrival
10/22/10	SYS-INF SYS-MID SYS-EFF	19,345.1	25	0	14 1 0	---	---	0.5	3,211.8	0.00	6.88	no	Restart system, off on arrival
11/23/10	SYS-INF SYS-MID SYS-EFF	19,395.5	0	0	NM NM NM	---	---	0.0	3,211.8	0.00	6.88	no	Off on arrival, system shutdown October 26, 2010 for rainy season.

**Notes:**

NM = not measured  
 cfm = cubic feet per minute.  
 ppmv = Parts per million by volume  
 lbs = Pounds  
 "H2O = Inches of water  
 SVE/AS = Soil vapor extraction and air sparge  
 FID = Flame Ionization Detector.  
 Hydrocarbon Removal/Emission Rate = Rate based on Bay Area Air Quality Management District's Manual of Procedures for Soil Vapor Extraction dated July 17, 1991.  
 Rate = vapor analytical concentration (ppmv) x system flowrate (scfm) x (1lb-mole/386 ft³) x molecular weight (86 lb/lb-mole for TPH-Gas hexane) x 1440 min/day x 1/1,000,000.  
 \* = Subtracted carbon tip readings of 28, 17, and 10, respectively, from influent, midpoint and effluent readings without carbon tip to account for methane.  
 (--) = not sampled  
 \*Soil vapor flow rates were not measured on 1/15/08 and 1/23/08 due to equipment breakage. For hydrocarbon mass removal calculation purposes, the flow rate recorded during the 1/10/08 visit was used.  
 \*\*Vapor flow meter being serviced from 7-24-2008 through 8-18-2008. Flow rates assumed from previous data, field observations, and adjustments made to system.

## **APPENDIX A**

Regulatory Letter



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

June 17, 2011

Mr. Leland Douglas (Sent via E-mail to: lee@douglasparking.com)  
Douglas Parking  
1721 Webster St.  
Oakland, CA 94612

Subject: Work Plan Denial for Fuel Leak Case No. RO0000129 and Geotracker Global ID T0600100140, Douglas Parking Company, 1721 Webster Street, Oakland, CA 94612–Groundwater Monitoring Requirements

Dear Mr. Douglas:

Alameda County Environmental Health (ACEH) staff has reviewed case file for the site including the most recently submitted documents entitled *Cross Section and Response to Agency Letter of November 19, 2010* dated March 23, 2010 and *Groundwater Monitoring and Remediation Summary Report – First Half 2011* dated April 1, 2011 both prepared by Pangea which reevaluates remedial options. Pangea's recommended remedial option is to inject the additive NONTOX™ into well MW-2 to reduce hydrocarbon concentrations.

ACEH does not concur that this remedial action would be effective and requests that you address the following technical comments, perform the proposed work, and send us the report specified below.

#### **TECHNICAL COMMENTS**

1. **Evaluation of Remedial Alternatives** – ACEH concurs with the UST Fund that a reevaluation of the remediation method should be performed. However, ACEH does not concur with the remediation method selected. Pangea proposes injecting NONTOX™ directly into MW-2, a monitoring well that is also being used as a compliance point. In the past, (before air-sparge and soil vapor extraction were performed) wells MW-2 and MW-3 were used as injection points for oxygen releasing compound (ORC) and/or hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) with no overall apparent decrease in contaminant mass. None of the three remedial options that were implemented at the site appears to have effectively addressed the remaining source at the site and no evaluation or analysis of why these methods have been ineffective has been performed. Therefore, injecting a new substance in the same monitoring wells does not appear to be an effective use of resources.

At this juncture, it may be advantageous to develop a site conceptual model (SCM), which synthesizes all the analytical data and evaluates all residual sources (location, depth, contaminant mass, etc.) while considering effectiveness of previous remediation strategies and identifying remaining data gaps. The analysis should lead to proposing an effective remedial option with an appropriate monitoring network that addresses the remaining contaminant mass. At a minimum, the SCM should include:

- (1) Local and regional plan view maps that illustrate the location of sources (former facilities, piping, tanks, etc.) extent of contamination, direction and rate of groundwater flow, potential preferential pathways, and locations of receptors;
- (2) Geologic cross section maps that illustrate subsurface features, man-made conduits, and lateral and vertical extent of contamination;
- (3) Plots of chemical concentrations versus time;
- (4) Plots of chemical concentrations versus distance from the source;
- (5) Summary tables of chemical concentrations in different media (i.e. soil, groundwater, and soil vapor); and
- (6) Well logs, boring logs, and well survey maps;
- (7) Discussion of likely contaminant fate and transport.

If data gaps (i.e. potential contaminant volatilization to indoor air or contaminant migration along preferential pathways, etc.) are identified in the SCM or if you feel there is not enough data to determine the appropriate remediation technology and target area, please include a proposed scope of work to address those data gaps in the SCM by the date specified below.

2. **Cross Sections** – Please add soil analytic data and in depth lithologic information and the conduit locations to the cross-sections.
3. **Preferential Pathway Survey** – As requested in our November 19, 2010 letter, please perform the well survey with a minimum of 1,000 foot radius and include the results in the SCM. Please review Department of Water Resources and Alameda County Public Works Agency records. No door to door well survey is needed at this time nor was it initially requested.

### **TECHNICAL REPORT REQUEST**

Please submit technical reports to ACEH (Attention: Barbara Jakub), according to the following schedule:

- **August 17, 2011 – SCM**

Thank you for your cooperation. Should you have any questions or concerns regarding this correspondence or your case, please call me at (510) 639-1287 or send me an electronic mail message at [barbara.jakub@acgov.org](mailto:barbara.jakub@acgov.org).

Sincerely,

Barbara J. Jakub, P.G.

Mr. Douglas  
RO0000129  
June 17, 2011, Page 3

Hazardous Materials Specialist

Enclosure: Responsible Party(ies) Legal Requirements/Obligations  
ACEH Electronic Report Upload (ftp) Instructions

cc: Bob Clark-Riddell, Pangea, 1710 Franklin Street, Suite 200, Oakland, CA 94612 (Sent via E-mail to: [briddell@pangeaenv.com](mailto:briddell@pangeaenv.com))  
Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032 (Sent via E-mail to: [lgriffin@oaklandnet.com](mailto:lgriffin@oaklandnet.com))  
Donna Drogos, ACEH (Sent via E-mail to: [donna.drogos@acgov.org](mailto:donna.drogos@acgov.org))  
Barbara Jakub, ACEH (Sent via E-mail to: [barbara.jakub@acgov.org](mailto:barbara.jakub@acgov.org))  
GeoTracker, e-file

## **APPENDIX B**

Boring Logs and Well Construction Details

**Table A - Groundwater Monitoring Program**  
Douglas Parking Company, 1721 Webster Street, Oakland, CA.

Well ID	Well Type	Screened Interval (ft bgs)	Well Location for Monitoring	Casing Diam. (in)	Gauge Frequency	Sample Frequency	TPHg/BTEX/MTBE	TAME/TBA/DIPE/ETBE/MTBE
<b>Onsite Monitoring and Remediation Wells</b>								
MW-1	Mon	17-30	Source Area	2	1st, 3rd	1st	1st	---
MW-2	Mon	19.5-29.5	Downgradient	2	1st, 3rd	1st, 3rd	1st, 3rd	---
MW-3	Mon	20-30	Upgradient	2	1st, 3rd	1st, 3rd	1st, 3rd	---
AS-1	Rem	27-30	Source Area	1	---	---	---	---
AS-2	Rem	27-30	Source Area	2	---	---	---	---
AS-3	Rem	27-30	Source Area	2	---	---	---	---
<b>Offsite Monitoring Wells</b>								
MW-4	Mon	15-30	Mid-Downgradient	2	1st, 3rd	1st, 3rd	1st, 3rd	---
MW-5	Mon	10-25	Downgradient	2	1st, 3rd	1st	1st	---
MW-6	Mon	15-30	Crossgradient	2	1st, 3rd	1st, 3rd	1st, 3rd	---
MW-7	Mon	15-30	Upgradient	2	1st, 3rd	1st	1st	---

Notes and Abbreviations:

1st = Sampled during the 1st quarter, typically January

1st, 3rd = Sampled during the 1st and 3rd quarters, typically January and July

Mon = Groundwater Monitoring Only

Rem= Remediation Well Only

--- = None or not applicable

AS-1 = Air Sparging Well



Project No. 9432 Boring/Well No. EB-1  
 Client: Douglas Parking Date Drilled: July 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 borings  
 Water Levels: 1st Enc: 24' Static: 21.5'

Borehole Completion  
 Well Installed: No  
 Total Depth: 30.5 feet  
 Grout Seal: 30' to surface

Sample No.	Blow Count	Depth	Lithology Log	Well Detail/Backfill
			Concrete and subgrade	
EB-1 @ 5'	grab	5	SM - Silty SAND, very dark grayish brown 10YR(3/2), up to 5% fine gravel to coarse sand, drills dense, damp.  color change to dark yellowish brown 10YR4/6, 15% clay, 20% silt, drills dense, damp.  driller calls change at 8 feet.	
EB-1 @ 10'	50 for 8'	10	CL - Sandy CLAY, dark yellowish brown 10YR(4/6), 15% silt 25% sand, low-med. plasticity, rare burrows, oxidation mottling, hard, damp.	
EB-1 @ 15'	82	15	SP - SAND, light olive brown 2.5Y(5/4), very fine to med. grained, very dense, damp to moist.	
EB-1 @ 20'	50 for 8'	20	color change to dark greenish gray discoloration 2.5Y(5/4), slight petroleum odor, very dense, moist.  driller calls water at 24 feet.	
EB-1 @ 25'	60	25	same as above, sheen on water, very dense, saturated.	
EB-1 @ 30'	24/50 for 8'	30	same as above, flowing conditions.  CL - Silty CLAY, light olive brown 2.5Y(5/4), 15% silt, 20% fine to med grained sand, low-med. plasticity, contaminants not observed, hard, damp.	
			Bottom of Boring = 30.5 feet, sand flows into lower 0.5 feet.	

QAMP CEG 126 Z

Project No. 9432 Boring/Well No. EB-2  
 Client: Douglas Parking Date Drilled: July 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 borings  
 Water Levels: 1st Enc: 24' Static: 22'

Borehole Completion  
 Well Installed: No  
 Total Depth: 30'  
 Cement Grout Seal: 27' to surface

Sample No.	Blow No.	Blow Count	Sample	Depth	Lithology Log	Well Detail/Backfill
					Concrete and subgrade	
					GW - Artificial FILL, base material.	
EB-2 @ 5'	-	grab	⊗	5		
EB-2 @ 10'	-	83	▨	10	artificial fill, dense, damp.	
EB-2 @ 15'	500 ppm	22/50 for 6"	▨	15	SP - SAND, light olive brown 2.5Y(5/4), rare burrows or root holes, petroleum odor, very dense, damp.	
EB-2 @ 20'	500+ ppm	17/50 for 3"	▨	20	same as above, very dense, moist.	
EB-2 @ 25'	1000 ppm	59	▨	25	same as above, color change to dark greenish gray 5GY(4/1), strong petroleum odor, dense, saturated.	
EB-2 @ 30'	-	63	▨	30	flowing conditions, clay on drill bit when withdrawn from borehole.	
					Bottom of Boring = 30 feet, flowing sand fills lower 3 feet	
					Han- hanby Field Analytical Chemical colormetric Test for petroleum hydrocarbons in parts per million.	
					CAMP CEG1262	

Project No. 9432 Boring/Well No. EB-3  
 Client: Douglas Parking Date Drilled: July 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 borings  
 Water Levels: 1st Enc: 24' Static: 22'

Borehole Completion  
 Well Installed: No  
 Total Depth: 30'  
 Cement Grout Seal: 26' to surface

Sample No.	Blow Han	Blow Count	Sample	Depth	Lithology Log	Well Detail/Backfill
					Concrete and subgrade	
EB-3 @ 5'	-	grab	⊗	5	CL - Sandy CLAY, olive 5Y(4/4), low plasticity, slight petroleum odor, drills soft, damp.	
EB-3 @ 10'	-	46	▨	10	sand interbed, 1.5' thick, slight petroleum odor,	
EB-3 @ 15'	-	54	▨	15	SP - SAND, dark yellowish brown 10YR(4/6), fine to med. grained, fines < 5%, dense, moist.	
EB-3 @ 20'	100 ppm	76	▨	20	same as above, moderate petroleum odor, dense, moist.	
EB-3 @ 25'	-	70	▨	25	same as above, sheen on water, very dense, saturated.	
EB-3 @ 30'	-	53	▨	30	CL - Silty CLAY, light olive brown 2.5Y(5/4), 40% silt, < 5% sand, med. plasticity, laminated, some burrows, hard, damp.	
Bottom of Boring = 30 feet, flowing sand fills lower 4 feet						
Han- Hanby Field Analytical Chemical Colormetric Test for petroleum hydrocarbons in parts per million.						
CWD CLK 1202						



Project No. 9432 Boring/Well No. EB-4  
 Client: Douglas Parking Date Drilled: July 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 borings  
 Water Levels: 1st Enc: 24' Static: 20'

Borehole Completion  
 Well Installed: No  
 Total Depth: 30'  
 Cement Grout Seal: 29' to surface

Sample No.	OV	Blow Count	Sample	Depth	Lithology Log	Well Detail/Backfill
					Concrete and subgrade	
EB-4 @ 5'	-	grab	⊗	5	SC-CL - Clayey SAND to Sandy CLAY, dark yellowish brown 10YR(4/3), 30-55% fine sand, low plasticity, rare burrows, drills dense to hard, damp.	
EB-4 @ 10'	-	29/50 for 2'	▨	10	same as above but sand content increasing, very dense, damp.	
EB-4 @ 15'	-	24/50 for 5"	▨	15	SP - SAND, olive brown 2.5Y(4/4) to greenish gray 5GY(5/1), fine to medium grained, <5% fines, very dense, damp to slightly moist.	
EB-4 @ 20'	-	51	▨	20	same as above, dense, slightly moist to moist.	▼
EB-4 @ 25'	-	65	▨	25	same as above, dense, saturated.	▼
EB-4 @ 30'	-	26	▨	30	CL - Silty CLAY, light greenish brown, 5Y(4/2), laminated, <15% fine sand, 20% silt, low to med. plasticity, few burrows, oxidized mottles, very stiff, damp.	
					Bottom of Boring = 30 feet, flowing sand fills lower 1 foot.	
UMP CEG 126 L						

Project No. 9432 Boring/Well No. EB-5  
 Client: Douglas Parking Date Drilled: July 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 borings  
 Water Levels: 1st Enc: 24' Static: 18'

Borehole Completion  
 Well Installed: No  
 Total Depth: 30'  
 Cement Grout Seal: 29' to surface

Sample No.	Blow Han	Count	Sample	Depth	Lithology Log	Well Detail/ Backfill
					Concrete and subgrade	
EB-5 @ 5'	1000 ppm	grab	⊗	5	CL - Sandy CLAY, dark yellowish brown 10YR(3/6), 15% silt, 20% sand, low to med. plasticity, drills firm, damp.  same as above, moderate petroleum odor, damp.	
EB-5 @ 10'	800 ppm	50	▨	10	same as above, 15% coarse sand, hard, slightly moist.	
EB-5 @ 15'	1000 ppm	60 for 5'	▨	15	SP - SAND, olive brown 2.5Y(4/4), fine to medium grained, strong petroleum odor, very dense, moist.	
EB-5 @ 20'	500 ppm	24/50 for 5'	▨	20	same as above, dark greenish gray 5GY(4/2), clay up to 35% disseminated, very dense, moist.	
EB-5 @ 25'	-	33	▨	25	same as above, clay <5%, strong petroleum hydrocarbon, dense, saturated.	
EB-5 @ 30'	-	32	▨	30	CL - Silty CLAY, light olive brown 5Y(6/2), 30% silt, med. to highly plastic, hard, damp.	
					Bottom of Boring = 30 feet, flowing sand fills lower 1 foot	
					Han- Hanby Field Analytical Chemical Colorimetric Test for petroleum hydrocarbons in parts per million.	
					(164) CEG 1262	

Project No. 9432 Boring/Well No. EB-6  
 Client: Douglas Parking Date Drilled: July 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 borings  
 Water Levels: 1st Enc: 24' Static: 21.50'

Borehole Completion  
 Well Installed: No  
 Total Depth: 30'  
 Cement Grout Seal: 28' to surface

Sample No.	Blow No.	Blow Count	Sample	Depth	Lithology Log	Well Detail/ Backfill
					Concrete and subgrade	
EB-6 @ 5'	-	grab	⊗	5	CL - Sandy CLAY, dark yellowish brown 10YR(4/4), 35% sand, med. plasticity, drills firm, damp.	
EB-6 @ 10'	-	42/50 for 3"	▨	10	same as above, color darkens to dark olive gray, slight petroleum odor, hard, damp.	
EB-6 @ 15'	-	50	▨	15	SP - SAND, olive 5Y(4/3), fine to med. grained, slight petroleum odor, dense to very dense, damp.	
EB-6 @ 20'	1000 ppm	57/50 for 5"	▨	20	same as above, stained dark bluish gray, strong petroleum odor, very dense, moist.	
EB-6 @ 25'	-	48	▨	25	same as above, strong petroleum odor, dense, saturated, flowing conditions.	
EB-6 @ 30'	-	51	▨	30	CL - Silty CLAY, pale olive, 5Y(6/3), laminated, 15% silt, highly plastic, hard, damp.	
					Bottom of Boring = 30 feet, flowing sand fills lower 2 feet	
					Han-Hanby Field Analytical Chemical Colometric Test for petroleum hydrocarbons in parts per million.	
					UMP 8/26/92	

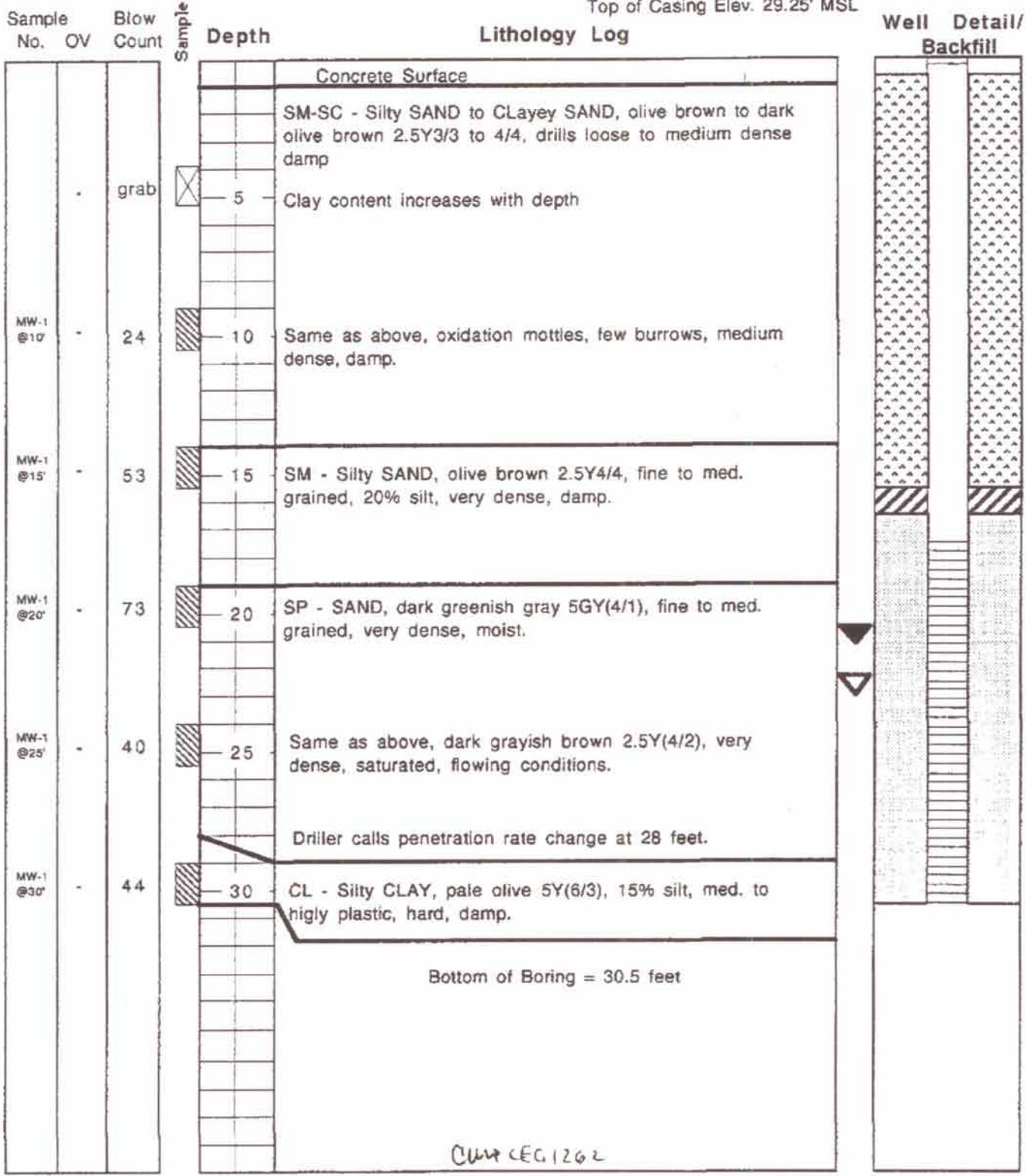


**Gen Tech Environmental, Inc. San Jose, CA**

**Exploratory Boring Log**

Project No. 9432 Boring/Well No. MW-1  
 Client: Douglas Parking Date Drilled: Sept. 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 #94501  
 Water Levels: 1st Enc: 23' Static: 21.7

**Borehole Completion**  
 Well Installed: 2" dia. Sch 40 PVC  
 Total Depth: 30.5' Casing Depth: 30.5'  
 Screen Length: 10' 0.020" Blank Length: 20.5'  
 Top Sand Pack: 16.5' Top Bentonite: 15.5'  
 Grout Seal: 15.5" to 0.5' vault box  
 Top of Casing Elev. 29.25' MSL



Project No. 9432 Boring/Well No. MW-2  
 Client: Douglas Parking Date Drilled: Sept. 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 #94501  
 Water Levels: 1st Enc: 24' Static: 20.1'

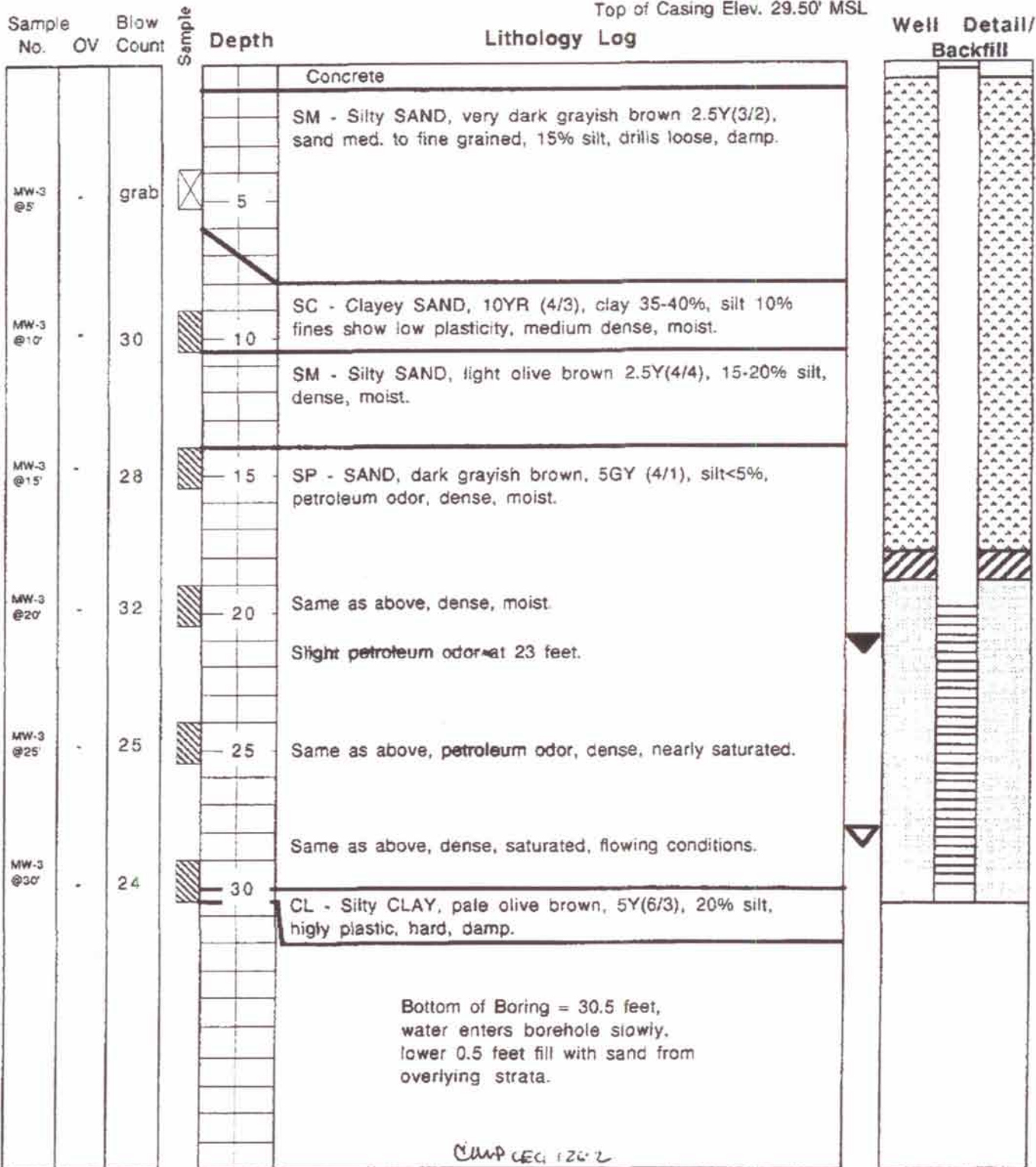
**Borehole Completion**  
 Well Installed: 2" dia. Sch 40 PVC  
 Total Depth: 30.5 Casing Depth: 29.5  
 Screen Length: 10' 0.020" Blank Length: 19.5  
 Top Sand Pack: 18.5' Top Bentonite: 17.5'  
 Grout Seal: 17.5' to 0.5' vault box  
 Top of Casing Elev. 27.10' MSL

Sample No.	Blow No.	Blow Count	Sample Depth	Lithology Log	Well Detail/Backfill
				Concrete	
MW-2 @ 5'	-	grab	5	SM - Silty SAND, very dark grayish brown 2.5Y(3/2), sand med. to fine grained, 15% silt, drills loose, damp.	
MW-2 @ 10'	-	27	10	SC - Clayey SAND, 10YR (4/3), clay 35-40%, silt 10% fines show low plasticity, medium dense, moist.	
				SM - Silty SAND, light olive brown 2.5Y(4/4), 15-20% silt, dense, moist.	
MW-2 @ 15'	500 ppm	31	15	SP - SAND, dark grayish brown, 5GY (4/1), silt < 5%, petroleum odor, dense, moist.	
MW-2 @ 20'	-	34	20	Same as above, dense, moist.	
MW-2 @ 25'	-	38	25	Same as above, dense nearly saturated.	
MW-2 @ 30'	-	44	30	Same as above, dense nearly saturated, flowing conditions.	
			30	CL - Silty CLAY, pale olive brown, 5Y(6/3), 20% silt, highly plastic, hard, damp.	
				Bottom of Boring = 30.5 feet	
				Han- Hanby Field Analytical Chemical Colometric Test, in parts per million	
				GUMP CEC 1262	



Project No. 9432 Boring/Well No. MW-3  
 Client: Douglas Parking Date Drilled: Sept. 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 #94501  
 Water Levels: 1st Enc: 28.20' Static: 21.60'

Borehole Completion  
 Well Installed: 2" dia. Sch 40 PVC  
 Total Depth: 30.5' Casing Depth: 30'  
 Screen Length: 10' 0.020" Blank Length: 20'  
 Top Sand Pack: 19' Top Bentonite: 18'  
 Grout Seal: 18' to 0.5' vault box  
 Top of Casing Elev. 29.50' MSL

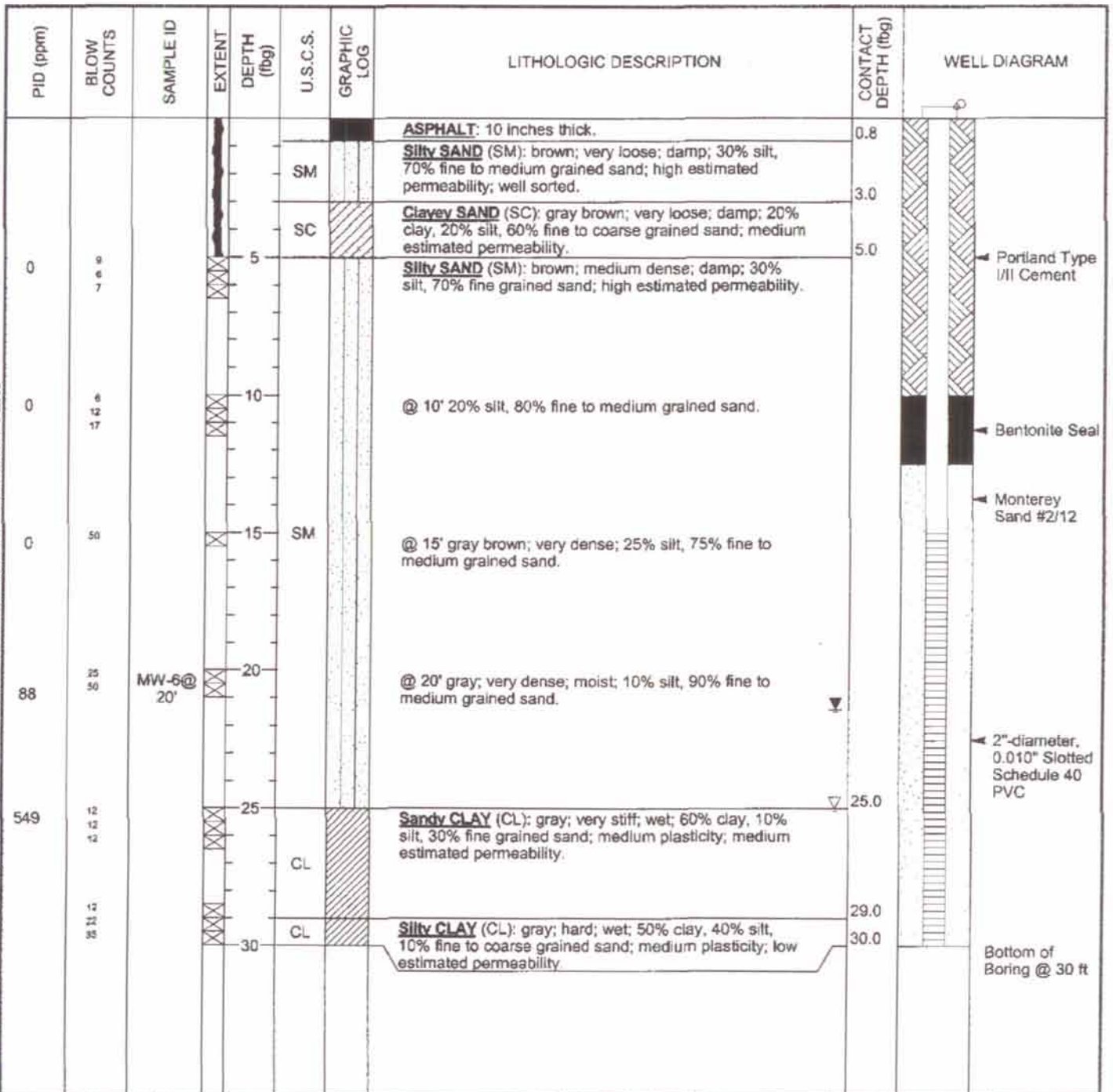




Cambria Environmental Technology, Inc.  
 5900 Hollis Street, Suite A  
 Emeryville, CA 94608  
 Telephone: (510) 420-0700  
 Fax: (510) 420-9170

# BORING/WELL LOG

CLIENT NAME	Douglas Parking Company	BORING/WELL NAME	MW-6
JOB/SITE NAME	Webster	DRILLING STARTED	27-Jun-03
LOCATION	1721 Webster Street, Oakland, CA.	DRILLING COMPLETED	27-Jun-03
PROJECT NUMBER	580-0197	WELL DEVELOPMENT DATE (YIELD)	30-Jun-03 (6 gallons)
DRILLER	Woodward Drilling	GROUND SURFACE ELEVATION	31 ft above msl
DRILLING METHOD	Hollow-stern auger	TOP OF CASING ELEVATION	30.99 ft above msl
BORING DIAMETER	8"	SCREENED INTERVAL	15 to 30 ft bgs
LOGGED BY	R. Fennell	DEPTH TO WATER (First Encountered)	25.0 ft (27-Jun-03)
REVIEWED BY	Mary C. Holland-Ford R.G. #7551	DEPTH TO WATER (Static)	21.40 ft (30-Jun-03)
REMARKS	Hand augered to 5' bgs.		



WELL LOG (PID), H:SB-2004 (JUST FUND)\DOUGLAS PARKING\1721 WEBSTER\FIGURES\SB0-0197.GPJ DEFAULT.GDT 9/22/03

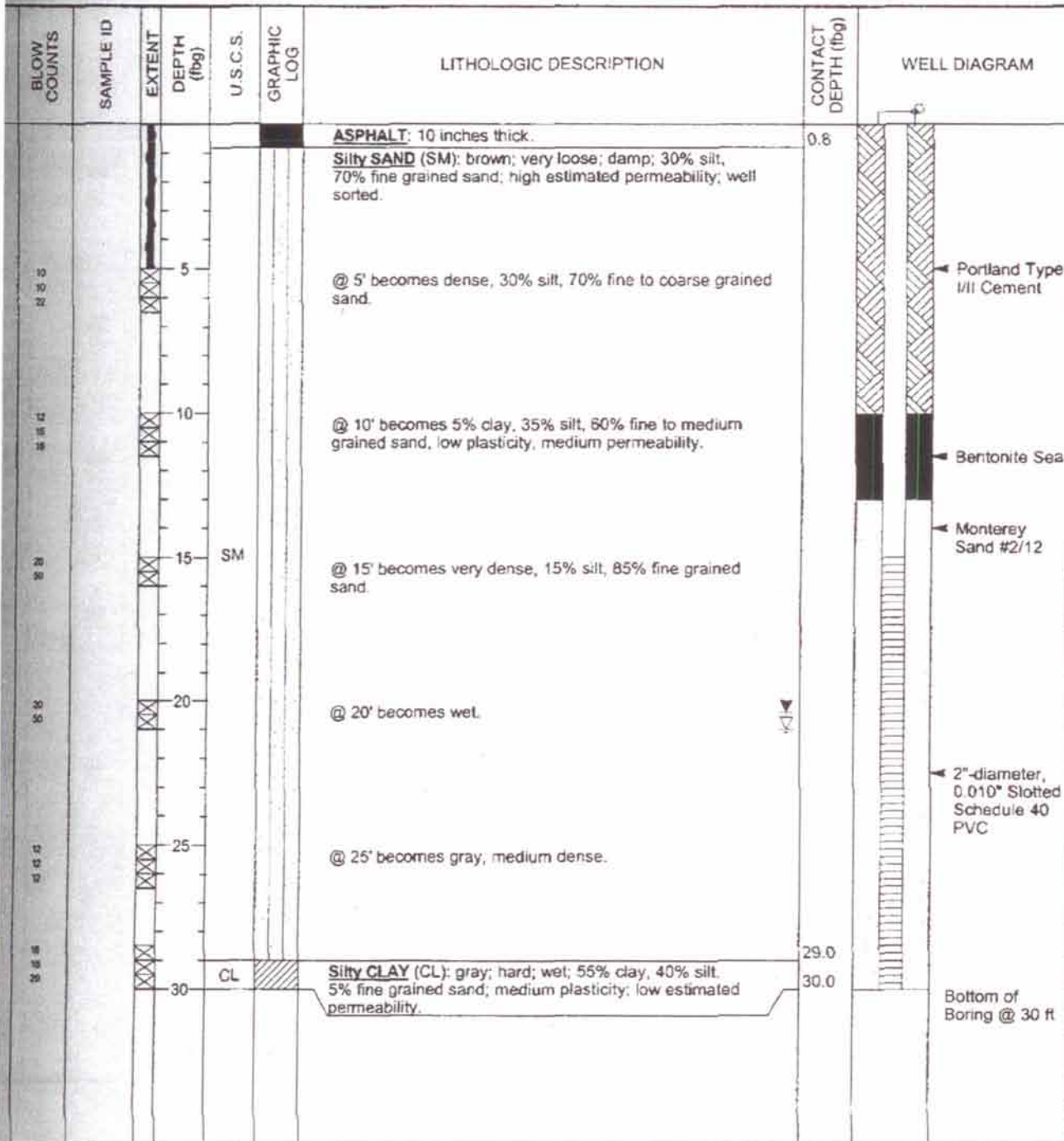


Cambria Environmental Technology, Inc.  
 5900 Hollis Street, Suite A  
 Emeryville, CA 94608  
 Telephone: (510) 420-0700  
 Fax: (510) 420-9170

# BORING/WELL LOG

Cross Section and Response to Agency Letter of November 19, 2010

CLIENT NAME	Douglas Parking Company	BORING/WELL NAME	MW-7
CLIENT ADDRESS	Webster	DRILLING STARTED	27-Jun-03
CLIENT LOCATION	1721 Webster Street, Oakland, CA.	DRILLING COMPLETED	27-Jun-03
PROJECT NUMBER	580-0197	WELL DEVELOPMENT DATE (YIELD)	30-Jun-03 (10 gallons)
DRILLER	Woodward Drilling	GROUND SURFACE ELEVATION	Not Surveyed
DRILLING METHOD	Hollow-stem auger	TOP OF CASING ELEVATION	NA
BOREHOLE DIAMETER	8"	SCREENED INTERVAL	15 to 30 ft bgs
LOGGED BY	R. Fennell	DEPTH TO WATER (First Encountered)	21.0 ft (27-Jun-03)
APPROVED BY	Mary C. Holland-Ford R.G. #7551	DEPTH TO WATER (Static)	20.40 ft (27-Jun-03)
REMARKS	Hand augered to 5' bgs.		

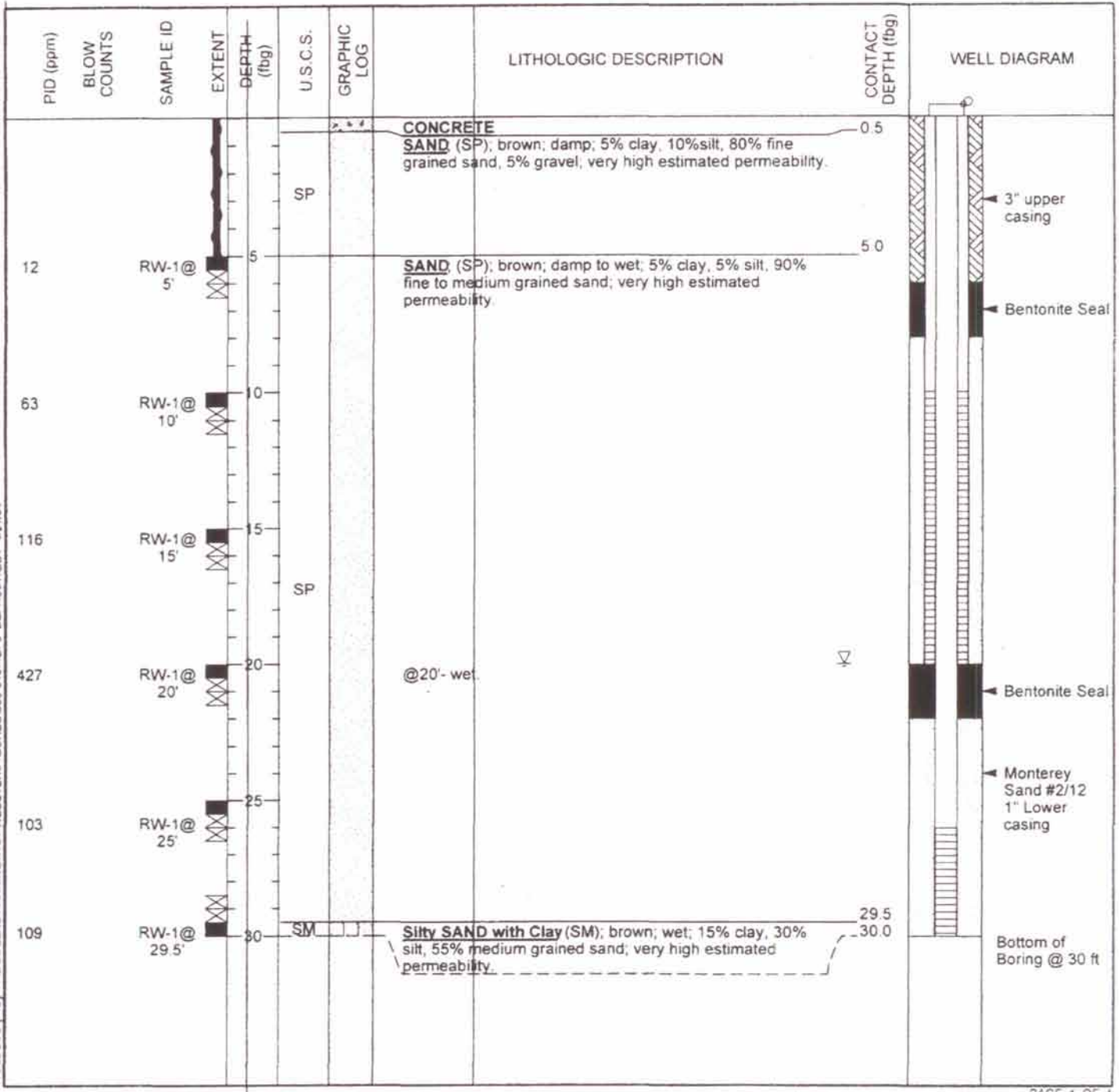




Cambria Environmental Technology, Inc.  
 5900 Hollis Street, Suite A  
 Emeryville, CA 94608  
 Telephone: (510) 420-0700  
 Fax: (510) 420-9170

# BORING/WELL LOG

CLIENT NAME	Douglas Parking Company	BORING/WELL NAME	SV-1/AS-1 (formerly RW-1)
JOB/SITE NAME	Webster	DRILLING STARTED	04-Mar-00
LOCATION	1721 Webster Street, Oakland, CA.	DRILLING COMPLETED	04-Mar-00
PROJECT NUMBER	580-0197	WELL DEVELOPMENT DATE (YIELD)	NA
DRILLER	Gregg Drilling	GROUND SURFACE ELEVATION	Not Surveyed
DRILLING METHOD	Hollow-stem auger Limited Access Rhino	TOP OF CASING ELEVATION	NA
BORING DIAMETER	8"	SCREENED INTERVAL	NA
LOGGED BY	J. Riggi	DEPTH TO WATER (First Encountered)	20.0 ft (04-Mar-00)
REVIEWED BY	R. Clark-Riddell, PE# 49629	DEPTH TO WATER (Static)	NA
REMARKS	Hand Augered to 5' bgs., boring located in Webster street sidewalk in garage entrance. Well is a co-axial SVE/AS well.		



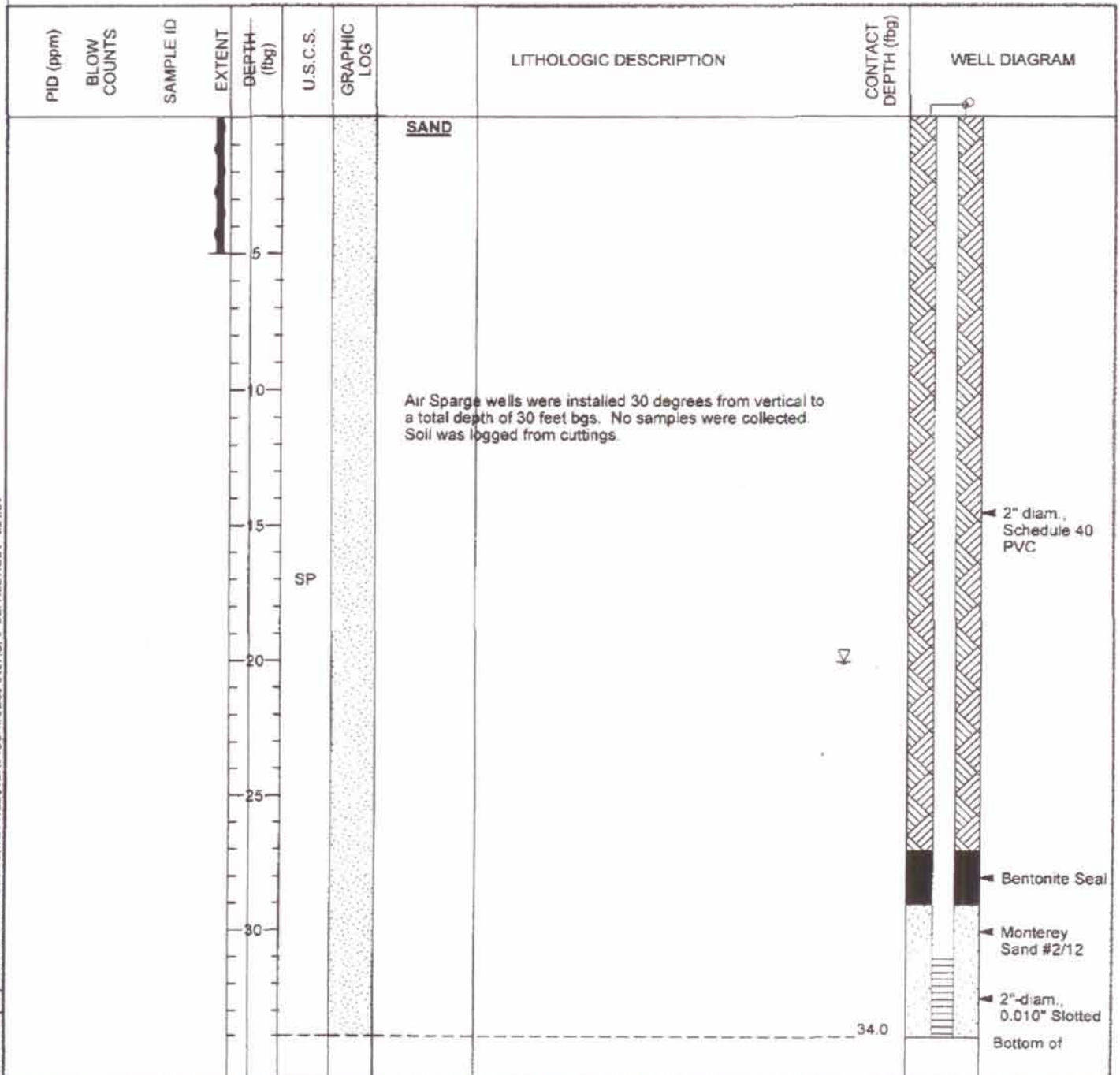
WELL LOG (PID) H:\DOUGLAS PARKING\1721 WEBSTER\FIGURES\580-0197 GPJ DEFAULT.GDT 4/21/04



Cambria Environmental Technology, Inc.  
 5900 Hollis Street, Suite A  
 Emeryville, CA 94608  
 Telephone: (510) 420-0700  
 Fax: (510) 420-9170

# BORING/WELL LOG

CLIENT NAME	Douglas Parking Company	BORING/WELL NAME	AS-2 (formerly AS-1)
JOB/SITE NAME	Webster	DRILLING STARTED	04-Mar-00
LOCATION	1721 Webster Street, Oakland, CA.	DRILLING COMPLETED	04-Mar-00
PROJECT NUMBER	580-0197	WELL DEVELOPMENT DATE (YIELD)	NA
DRILLER	Gregg Drilling	GROUND SURFACE ELEVATION	Not Surveyed
DRILLING METHOD	Hollow-stem auger Limited Access Rhino	TOP OF CASING ELEVATION	NA
BORING DIAMETER	8"	SCREENED INTERVAL	31 to 34 ft bgs
LOGGED BY	J. Riggi	DEPTH TO WATER (First Encountered)	20.0 ft (04-Mar-00)
REVIEWED BY	R. Clark-Riddell, PE# 49629	DEPTH TO WATER (Static)	NA
REMARKS	Hand Augered to 5' bgs. Boring located in Webster street sidewalk in garage entrance.		



WELL LOG (PID) H:\DOUGLAS PARKING\1721 WEBSTER\FIGURES\580-0187.GPJ DEFAULT.GDT 4/2/04

Continued Next Page

PAGE 1 OF 2

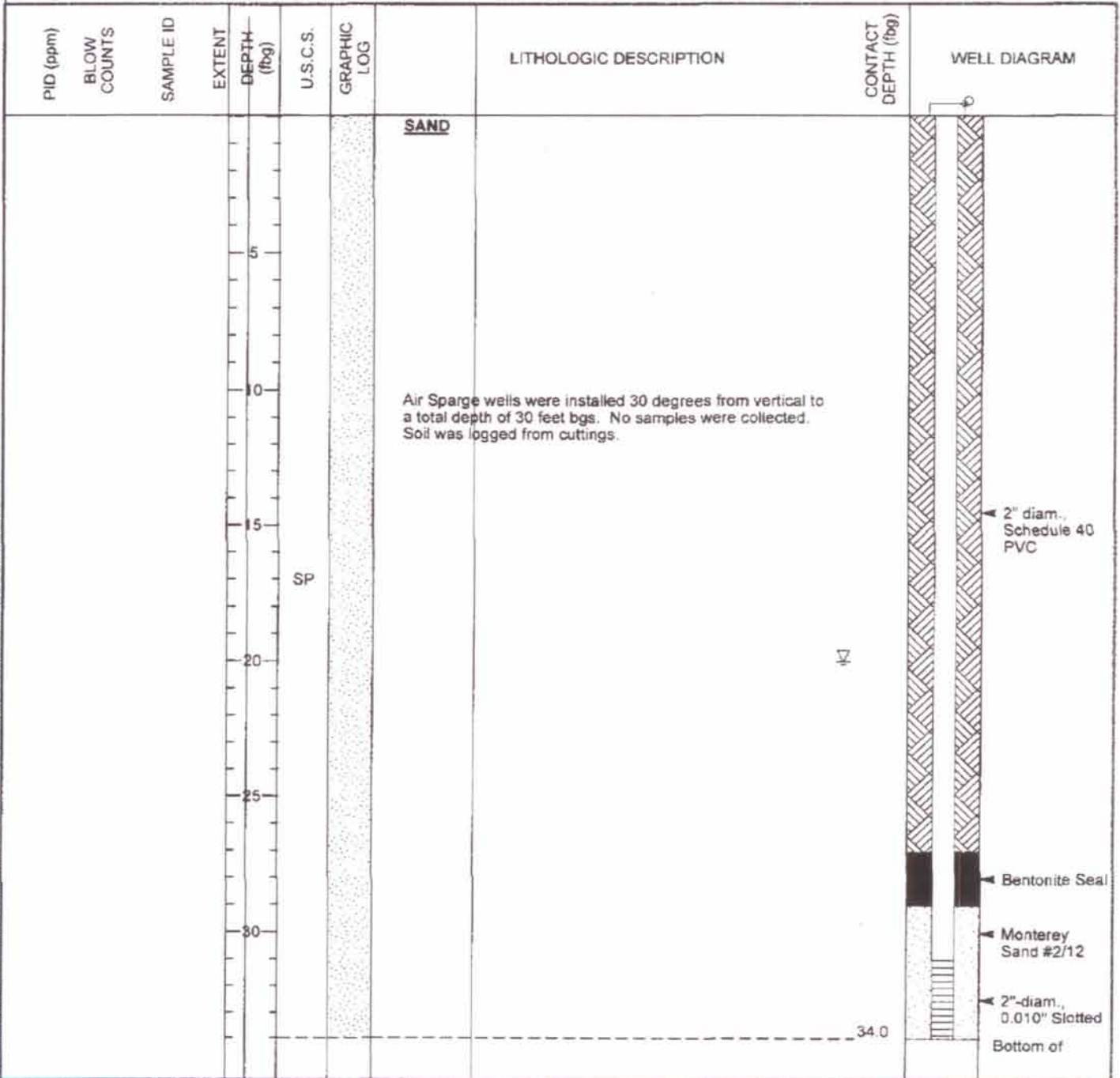




Cambria Environmental Technology, Inc.  
 5900 Hollis Street, Suite A  
 Emeryville, CA 94608  
 Telephone: (510) 420-0700  
 Fax: (510) 420-9170

# BORING/WELL LOG

CLIENT NAME	Douglas Parking Company	BORING/WELL NAME	AS-3 (formerly AS-2)
JOB/SITE NAME	Webster	DRILLING STARTED	04-Mar-00
LOCATION	1721 Webster Street, Oakland, CA.	DRILLING COMPLETED	04-Mar-00
PROJECT NUMBER	580-0197	WELL DEVELOPMENT DATE (YIELD)	NA
DRILLER	Gregg Drilling	GROUND SURFACE ELEVATION	Not Surveyed
DRILLING METHOD	Hollow-stem auger Limited Access Rhino	TOP OF CASING ELEVATION	NA
BORING DIAMETER	8"	SCREENED INTERVAL	31 to 34 ft bgs
LOGGED BY	J. Riggi	DEPTH TO WATER (First Encountered)	20.0 ft (04-Mar-00) $\nabla$
REVIEWED BY	R. Clark-Riddell, PE# 49629	DEPTH TO WATER (Static)	NA $\nabla$
REMARKS	Hand Augered to 5' bgs. Boring located in Webster street sidewalk in garage entrance.		



WELL LOG (PID) M:DOUGLAS PARKING\1721 WEBSTER\FIGURES\580-0197.OPJ DEFAULT.GDT 4/21/04

**BORING LOG**

Boring ID

**SB-A**

Client: **Douglas Parking Company**

Location **1721 Webster Street**

Project No: **58-197**

Phase

Task **02**

Surface Elev. **NA ft.**

Page 1 of 1

Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0							0	
			<b>ASPHALT</b>					
5			<b>Silty SAND; (SM);</b> grey to brown; damp to moist; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10							10	
15			<b>SAND; (SP);</b> grey to brown; moist; 10% silt, 90% medium grained sand; high estimated permeability				15	
20				nd			20	
25							25	
30							30	Bottom of boring

Driller **Vironex**

Drilling Started **2/22/96**

Notes: **Webster Street in #4 lane**

Logged By **JME**

Drilling Completed **2/22/96**

**near site entrance**

Water-Bearing Zones **NA**

Grout Type **Portland Type I/II**

Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0	Ground Surface		<b>ASPHALT</b>				0	
5			<b>Silty SAND</b> ; (SM); brown; damp; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10			moist				10	
15			<b>SAND</b> ; (SP); brown; damp; 10% silt, 90% medium grained sand; high estimated permeability				15	
20			grey; wet	580.00			20	
								Bottom of boring
25							25	
30							30	

Driller <b>Vironex</b>	Drilling Started <b>2/22/96</b>	Notes: <b>Webster Street in #2 lane</b>
Logged By <b>JME</b>	Drilling Completed <b>2/22/96</b>	<b>near site entrance</b>
Water-Bearing Zones <b>NA</b>	Grout Type <b>Portland Type I/II</b>	



**BORING LOG**

Boring ID **SB-C**

Client: **Douglas Parking Company**

Location **1721 Webster Street**

Project No: **58-197**

Phase

Task **02**

Surface Elev. **NA ft.**

Page **1** of **1**

Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0	Ground Surface		<b>ASPHALT</b>				0	
5			<b>Silty SAND; (SM);</b> brown; moist; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10			wet				10	
15			<b>SAND; (SP);</b> brown; moist; 10% silt, 90% medium grained sand; high estimated permeability				15	
20			grey; wet	1.40			20	
25							25	
30							30	Bottom of boring

Driller <b>Vironex</b>	Drilling Started <b>2/22/96</b>	Notes: <b>Webster Street in #4 lane,</b>
Logged By <b>JME</b>	Drilling Completed <b>2/22/96</b>	<b>34' northeast of MW-2</b>
Water-Bearing Zones <b>NA</b>	Grout Type <b>Portland Type I/II</b>	

BOR 58197 5/21/96

BORING LOG				Boring ID			SB-D	
Client: <b>Douglas Parking Company</b>				Location <b>1721 Webster Street</b>			Page 1 of 1	
Project No: <b>58-197</b>		Phase	Task <b>02</b>	Surface Elev. <b>NA ft.</b>				
Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0			Ground Surface				0	
			ASPHALT					
5			<b>Silty SAND</b> ; (SM); brown; damp; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10							10	
15			<b>SAND</b> ; (SP); brown; damp; 10% silt, 90% medium grained sand; high estimated permeability				15	
20			grey; wet	660.00			20	
								Bottom of boring
25							25	
30							30	

Driller <b>Vironex</b>	Drilling Started <b>2/22/96</b>	Notes: <b>Webster Street in #4 lane,</b>
Logged By <b>JME</b>	Drilling Completed <b>2/22/96</b>	<b>62' northeast of MW-2</b>
Water-Bearing Zones <b>NA</b>	Grout Type <b>Portland Type I/II</b>	

BOR 58197 5/21/96

BORING LOG				Boring ID		SB-E		
Client: <b>Douglas Parking Company</b>				Location <b>1721 Webster Street</b>		Page <b>1</b> of <b>1</b>		
Project No: <b>58-197</b>		Phase	Task <b>02</b>		Surface Elev. <b>NA</b> ft.			
Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0			ASPHALT				0	
5			<b>Silty SAND:</b> (SM); brown; damp; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10							10	
15			<b>SAND:</b> (SP); brown; damp; 10% silt, 90% medium grained sand; high estimated permeability				15	
20			grey; wet	nd			20	
25							25	Bottom of boring
30							30	

Driller **Vironex**  
 Logged By **JME**  
 Water-Bearing Zones **NA**

Drilling Started **2/23/96**  
 Drilling Completed **2/23/96**  
 Grout Type **Portland Type I/II**

Notes: **Webster Street in #4 lane, 62' northeast of MW-2**









BORING LOG				Boring ID		SB-F		
Client: <b>Douglas Parking Company</b>				Location <b>1721 Webster Street</b>		Page 1 of 1		
Project No: <b>58-197</b>		Phase	Task <b>02</b>	Surface Elev. <b>NA</b> ft.				
Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0	Ground Surface		ASPHALT				0	
5			Silty SAND: (SM); brown; moist; 30% silt, 70% fine to medium grained sand; moderate estimated permeability		[Vertical Line Pattern]	[Diagonal Cross-Hatch Pattern]	5	
10							10	
15			SAND: (SP); brown; moist; 10% silt, 90% medium grained sand; high estimated permeability		[Vertical Line Pattern]	[Diagonal Cross-Hatch Pattern]	15	
20			wet	nd		[Diagonal Cross-Hatch Pattern]	20	
25						[Diagonal Cross-Hatch Pattern]	25	Bottom of boring
30							30	

Driller <b>Vironex</b>	Drilling Started <b>2/23/96</b>	Notes: <b>Webster Street in #2 lane</b>
Logged By <b>JME</b>	Drilling Completed <b>2/23/96</b>	<b>near 17th Street crosswalk</b>
Water-Bearing Zones <b>NA</b>	Grout Type <b>Portland Type I/II</b>	

BOR 58197 5/21/96

BORING LOG				Boring ID		SB-G		
Client: <b>Douglas Parking Company</b>				Location: <b>1721 Webster Street</b>		Page 1 of 1		
Project No: <b>58-197</b>		Phase		Task <b>02</b>		Surface Elev. <b>NA ft.</b>		
Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0			Ground Surface				0	
			<b>ASPHALT</b>					
			<b>Silty SAND; (SM); brown; damp; 20% silt, 80% fine to medium grained sand; moderate to high estimated permeability</b>				5	
			<b>SAND; (SP); brown; moist; 10% silt, 90% medium grained sand; high estimated permeability</b>				10	
			wet				15	
			wet				20	
				nd			20	
							25	
							30	
								Bottom of boring

Driller <b>Vironex</b>	Drilling Started <b>2/23/96</b>	Notes: <b>Webster Street in #4 lane</b>
Logged By <b>JME</b>	Drilling Completed <b>2/23/96</b>	<b>near 19th Street crosswalk</b>
Water-Bearing Zones <b>NA</b>	Grout Type <b>Portland Type I/II</b>	

BOR 58197 5/21/96

DRILLING LOG				Well ID <b>MW-4</b>	Boring ID <b>SB-H</b>			
Client: <b>Douglas Parking Company</b>		Project No: <b>58-197</b>		Location <b>1721 Webster Street</b>				
Phase		Task02		Surface Elev. <b>25.64 ft.</b>				
Page 1 of 1								
Depth (feet)	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth (feet)	Well Construction Details
0			Ground Surface				0	T.O.C. Elev. 25.29
0			ASPHALT CONCRETE					
5			FILL: (ML); light brown; damp; 10% clay, 60% silt, 30% fine to medium grained sand; low plasticity; low estimated permeability				5	
2	4							
4	11		Silty SAND; (SM); brown; medium dense; damp; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				10	
6	11							
15	6		SAND; (SP); brown; medium dense; damp; 5% silt, 95% medium grained sand; high estimated permeability				15	
6	15							
20	12		grey; wet	1			20	
12	24							
25	3		loose				25	
3	6							
30	6		Clayey SILT; (ML); grey; very stiff; wet; 20% clay; 50% silt, 30% medium grained sand; medium plasticity; low estimated permeability	nd			30	
6	12							
12	10							Bottom of well
10							35	
35							35	

Driller <b>SES, Inc.</b>	Development Yield <b>010</b>	Bentonite Seal <b>8'to 9'</b>
Logged By <b>JME</b>	Well Casing <b>0.39 gpmDia. 0' to 15'</b>	Sand Pack <b>Monterey Sand</b>
Drilling Started <b>5/3/96</b>	Casing Type <b>Schedule 40 PVC</b>	Sand Pack Type <b>#2/16</b>
Drilling Completed <b>5/3/96</b>	Well Screen <b>2" Dia. 15' to 30'</b>	Static Water Level <b>16.98</b> ft Depth
Construction Completed <b>5/3/96</b>	Screen Type <b>Schedule 40 PVC</b>	Date <b>5/10/96</b>
Development Completed <b>5/6/96</b>	Slot Size <b>0.010"</b>	Notes: <b>Webster Street in #1 lane</b>
Water Bearing Zones <b>NA</b>	Drilling Mud <b>NA</b>	<b>62' northeast of MW-2</b>
	Grout Type <b>Portland Type I/II</b>	

WELL 58197 6/27/96



DRILLING LOG				Well ID <b>MW-5</b>	Boring ID <b>SB-1</b>			
Client: <b>Douglas Parking Company</b>		Project No: <b>58-197</b>		Location: <b>1721 Webster Street</b>				
Phase		Task02		Surface Elev. <b>22.22 ft.</b>				
				Page <b>1</b> of <b>1</b>				
Depth (feet)	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth (feet)	Well Construction Details
0							0	T.O.C. Elev. 21.97
Ground Surface			<b>ASPHALT</b> <b>CONCRETE</b>					
5			<b>FILL:</b> (ML); light brown; damp; 10% clay, 60% silt, 30% fine to medium grained sand; low plasticity; low estimated permeability				5	
10			<b>SAND:</b> (SP); brown; very dense; damp; 5% silt, 95% fine to medium grained sand; high estimated permeability				10	
15	6 26 28		moist to wet	nd			15	
20	3 4 4						20	
25	6 10 18		<b>Clayey SILT:</b> (ML); gray to brown; medium stiff; wet; 20% clay; 50% silt, 30% medium grained sand; medium plasticity; low estimated permeability	nd			25	
30							30	Bottom of well

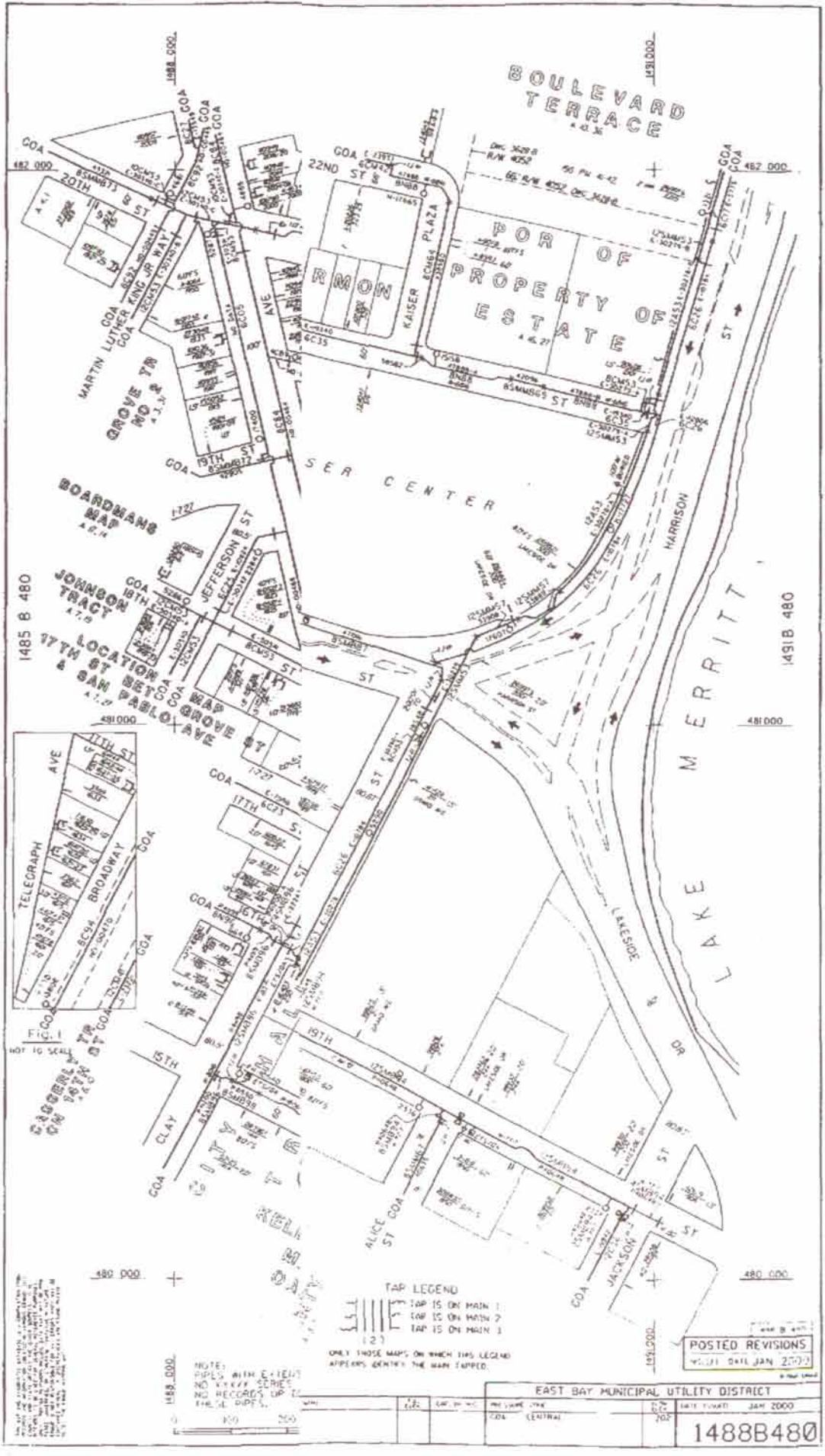
Driller <b>SES, Inc.</b>	Development Yield <b>010</b>	Bentonite Seal <b>8'to 9'</b>
Logged By <b>JME</b>	Well Casing <b>0.52 gpmDia. 0' to 10'</b>	Sand Pack <b>Monterey Sand</b>
Drilling Started <b>5/3/96</b>	Casing Type <b>Schedule 40 PVC</b>	Sand Pack Type <b>#2/16</b>
Drilling Completed <b>5/3/96</b>	Well Screen <b>2" Dia. 10' to 25'</b>	Static Water Level <b>14.60</b> ft Depth
Construction Completed <b>5/3/96</b>	Screen Type <b>Schedule 40 PVC</b>	Date <b>5/10/96</b>
Development Completed <b>5/6/96</b>	Slot Size <b>0.010"</b>	Notes: <b>Webster Street in #4 lane</b>
Water Bearing Zones <b>NA</b>	Drilling Mud <b>NA</b>	<b>near 19th Street crosswalk</b>
	Grout Type <b>Portland Type I/II</b>	

WELL 58197 6/27/96

## **APPENDIX C**

### Subsurface Utility Maps





NOT TO SCALE  
 1488,000  
 482,000  
 480,000  
 1485,000  
 1491,000

NOTE: THIS MAP IS A REPRODUCTION OF THE ORIGINAL MAP AND DOES NOT CONTAIN ANY RECORDS OF THE ORIGINAL MAP.

1485 B 480  
 1491 B 480

**TAP LEGEND**  
 1 1/2" TAP IS ON MAIN 1  
 2" TAP IS ON MAIN 2  
 3" TAP IS ON MAIN 3  
 ONLY THOSE MAPS ON WHICH THIS LEGEND APPEARS IDENTIFY THE MAIN TAPPED.

POSTED REVISIONS  
 DATE: JAN 27 2000

EAST BAY MUNICIPAL UTILITY DISTRICT			
NO.	DATE	BY	REVISION
1	JAN 27 2000	JAN 27 2000	POSTED

1488B480

