

R0129

C A M B R I A

April 22, 2004

Mr. Don Hwang  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

Alameda County  
APR 27 2004  
Environmental Health

Re: **Feasibility Test Report**  
Douglas Parking Company  
1721 Webster Street  
Oakland, California 94612  
ACHCSA Site # 4070



Dear Mr. Chan:

On behalf of Mr. Douglas, Cambria Environmental Technology, Inc. (Cambria) is submitting this *Feasibility Test Report* for the above-referenced site. This report details the soil vapor extraction and air sparge testing activities proposed in Cambria's *Work Plan Addendum* dated August 12, 2003.

If you have any questions regarding this report, please contact me at (510) 420-3305.

Sincerely,  
**Cambria Environmental Technology, Inc.**

Gretchen Hellmann  
Project Engineer

Enclosure: Feasibility Test Report

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

**Cambria  
Environmental  
Technology, Inc.**

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C A M B R I A

FEASIBILITY TEST REPORT

Douglas Parking Company  
1721 Webster Street  
Oakland, California  
ACHCSA Site # 4070  
Cambria Project # 580-0197

April 22, 2004

Alameda County  
APR 21 2004  
Environmental Health

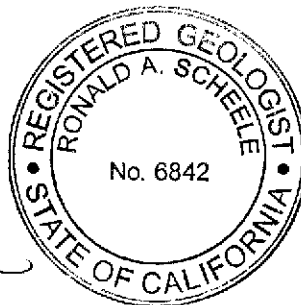


*Prepared for:*

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

*Prepared by:*

Cambria Environmental Technology, Inc.  
5900 Hollis Street, Suite A  
Emeryville, California 94608



*Gretchen Hellmann*

Gretchen Hellmann  
Project Engineer

*Ron Scheele*

Ron Scheele, R.G.  
Senior Geologist

Douglas Parking Company  
1721 Webster Street  
Oakland, California  
ACHCSA Site # 4070

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## FEASIBILITY TEST REPORT

Douglas Parking Company  
1721 Webster Street  
Oakland, California  
ACHCSA Site # 4070  
Cambria Project # 580-0197

April 22, 2004



## INTRODUCTION

On behalf of Douglas Parking Company, Cambria Environmental Technology, Inc. (Cambria) is submitting this *Soil Vapor Extraction / Air Sparge Test Report* for the above-referenced site. This investigation was conducted according to Cambria's *Remedial Work Plan* dated November 11, 1998 and *Work Plan Addendum* dated August 12, 2003, which were approved in a letter from the Alameda County Health Care Services Agency (ACHCSA) dated September 23, 2003 (Appendix A). The site background, feasibility testing, conclusions, and recommendations are presented below.

## 2.0 SITE BACKGROUND

### 2.1 Site Description


**Site Location:** The site is located on 1721 Webster Street between 17th and 19th Streets in downtown Oakland, California. The site is located approximately five miles east of the San Francisco Bay and one half-mile west of Lake Merritt (Figure 1). The site is currently being utilized as a parking garage (see Figure 2).

**Potential Offsite Sources:** A former gas station is located directly southeast of the site at 1700 Webster Street. A review of Sanborn maps indicates that a gas station operated there from approximately 1953 to 1964.

A property (Prentiss Properties) suspected of having USTs is located northeast of the site at 1750 Webster Street. Several investigations have been performed at the Prentiss Properties site including the drilling of eighteen soil borings and the installations of three monitoring wells. Groundwater samples collected by ATC Associates, Inc. (ATC) on February 8, 1998 detected MTBE concentrations up to 2,900 micrograms per liter ( $\mu\text{g/L}$ ). Eleven of the twelve groundwater samples collected during ATC's investigation contained detectable MTBE concentrations.

A former Chevron Service station is located approximately 400 feet southwest of the site, on the corner of 17<sup>th</sup> Street and Harrison Street. The groundwater has been impacted by hydrocarbons in the vicinity of the Chevron station.

## 2.2 Site History



**1992 Tank Removal:** On August 3 and 6, 1992, Parker Environmental Services of Pittsburg, California removed one 1,000-gallon and two 500-gallon gasoline underground storage tanks (USTs). Seven soil samples (T-1 through T-7) were collected from beneath the USTs, four soil samples (SW-1 through SW-4) were collected from the UST sidewalls, and six soil samples (L-1 through L-6) were collected beneath the dispensers and associated product piping. 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.

**1994 Subsurface Investigation:** On July 8 and September 8, 1994, Gen Tech/Piers Environmental, Inc. (Gen Tech) of San Jose, California drilled six exploratory borings (EB-1 through EB-6) and installed three groundwater monitoring wells (MW-1 through MW-3). TPHg and benzene concentrations of 650 mg/kg and 0.2 mg/kg, respectively, were detected in the soil samples collected at 20 feet below ground surface (bgs) near the former USTs. Maximum TPHg and benzene concentrations of 350,000 µg/L and 10,000 µg/L were detected in groundwater samples collected from well MW-2, immediately downgradient of the former USTs.

**1996 Subsurface Investigation:** In February and May 1996, Cambria advanced seven geoprobe soil borings (SB-A through SB-G) and installed two groundwater monitoring wells (MW-4 and MW-5). A maximum TPHg concentration of 660 mg/kg was detected at 20.5 ft bgs in a soil sample collected from boring SB-D, located downgradient from the former USTs. No benzene was detected in any of the soil samples. TPHg and benzene concentrations of 15,000 µg/L and <5 µg/L were detected in groundwater samples collected from well MW-4 located downgradient of the former USTs.

**Oxygen Releasing Compound (ORC) Update:** To enhance the natural attenuation of dissolved-phase hydrocarbons, Cambria installed ORC socks in well MW-2 on January 8, 1998. Dissolved oxygen (DO) concentrations increased in well MW-2 as compared to other site wells, however, the result was temporary.

**Hydrogen Peroxide Injections:** In February and March 1999, Cambria added a total of 120 gallons of 7.5% hydrogen peroxide solution into monitoring wells MW-2 and MW-3 to increase DO levels and enhance the biodegradation of dissolved-phase hydrocarbons. The hydrogen peroxide temporarily

increased groundwater DO levels, however hydrocarbon concentrations remained at elevated levels following the hydrogen peroxide activities.

**Remedial Well Installation:** On March 4, 2003, Cambria supervised the installation of 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 in the immediate vicinity of the former USTs (Figure 3).

**2003 Subsurface Investigation:** On June 27, 2003, Cambria installed two groundwater monitoring wells (MW-6 and MW-7) to further delineate the hydrocarbon plume. A TPHg concentration of 120,000 micrograms per kilogram (ug/kg) was detected in a groundwater sample collected from well MW-6. No hydrocarbons were detected in well MW-7. The hydrocarbons detected in offsite well MW-6 were suspected to have originated from a former gas station located at 1700 Webster Street.



### 2.3 Site 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 the site has ranged from approximately 16.8 to 22.2 feet bgs, with groundwater consistently flowing towards the northeast (Table 1). Groundwater elevations for the first quarter of 2004 are shown on Figure 2, and indicate an approximate gradient of 0.016 feet/foot to the northeast. Soil boring logs are included in Appendix B.

## 3.0 FEASIBILITY TESTING ACTIVITIES AND RESULTS


Following ACHCSA's approval of Cambria's *Work Plan Addendum – Proposed Feasibility Testing*, Cambria conducted a soil vapor extraction (SVE) / air sparge (AS) feasibility test on October 4, 2003. The objectives of the feasibility test were to:

- Determine hydrocarbon mass removal rates of extracted soil vapors;
- Determine the effective vacuum radius of influence;
- Evaluate the applicability of SVE and/or AS as a remedial alternative; and
- Determine the appropriate type and size of equipment for a full scale remediation system.

### 3.1 Field Activities

**Cambria Personnel Present:** Rowan Fennell, Technician  
Gretchen Hellmann, Project Engineer

- Equipment Provider:** Mako Industries, Inc., of Fountain Valley, California.
- Notifications:** Cambria notified the Bay Area Air Quality Management District of the test on September 29, 2003.
- Feasibility Test Date:** Saturday, October 4, 2003.



**Field Procedures:** To extract soil vapor from well SV-1, Cambria used SVE equipment provided by Mako Industries, Inc. of Fountain Valley, California. The equipment consisted of a trailer mounted 25-kilowatt generator, a Roots 56 positive displacement blower, a knockout tank, and a 250 standard cubic feet per minute (scfm) thermal oxidizer. A 1.5-horsepower electric compressor with air purifying, filters was used to inject air into air sparge wells AS-1, AS-2, and AS-3. Well SV-1 was connected to the SVE system with airtight hoses and fittings. Magnehelic vacuum gauges were connected to sealed well caps on observation wells MW-2, MW-3, MW-6 to observe vacuum influence. Extraction flow rates were measured using a thermo-anemometer flow meter. To assess concentration trends during testing, the extracted soil vapors were field analyzed using a Horiba gas analyzer. Total hydrocarbons and percent oxygen were monitored and recorded (see Table 1). The feasibility test was completed in several stages during a 6-hour period. The details of the SVE step tests, SVE constant vacuum test, and the SVE / AS tests follow.


**SVE Step Tests:** Step tests were performed to evaluate the applied vacuum versus flow characteristics of the subsurface and to determine an optimal applied vacuum for the constant vacuum test.

A field sample was also collected in a tedlar bag and submitted to McCampbell Analytical Inc. of Pacheco, California for analysis of total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 8015 and benzene, toluene, ethylbenzene, xylenes (BTEX), and methyl tertiary butyl ether (MTBE) using EPA Method 8020. For the remainder of the feasibility test, a Horiba gas analyzer was used to measure hydrocarbon concentrations and evaluate concentrations trends.

Flow rates ranged between 3.9 and 9.2 scfm and hydrocarbon concentrations ranged from 40 to 14,500 parts per million volume (ppmv). See Table 3 for a summary of test data.

**SVE Constant Vacuum Test:** A constant vacuum test was conducted with an applied vacuum of 60 to 65 i.w. for a period of 35 minutes. Vapor flow rate, hydrocarbon concentration, and observation well vacuum readings stabilized within 25 minutes. Vapor flow rates ranged from 6.4 to 8.5 scfm and hydrocarbon concentrations ranged from 8,700 to 9,300. The calculated hydrocarbon removal rate ranged from 21 to 28 pounds per day (lbs/day). At the end of the constant vacuum test, a vacuum

influence was observed in wells MW-2 and MW-3 at 0.17 and 0.30 i.w., respectively. No vacuum influence was observed in well MW-6. See Table 2 for the test data.



**SVE / AS Tests:** Following the SVE constant vacuum test, a combined SVE/AS test was performed to determine the effect that air sparging would have on vapor flow rates and hydrocarbon concentrations in comparison to SVE only. An electric air compressor was used individually to inject purified air into each of the AS wells. Air sparging was conducted at a series of increasing pressures ranging from 2.5 to 15 psi, which resulted in flow rates ranging from 2.5 to 6.0 cfm. Well vacuum flow, and hydrocarbon concentrations were monitored during each air sparge step. Air sparging into each AS well resulted in hydrocarbon concentrations ranging from approximately 16,900 to 22,500 ppmv. Even though extraction flow rates remained stable, higher hydrocarbon concentrations caused the hydrocarbon removal rate to increase substantially from a maximum of 20 lbs/day during SVE to 42 lbs/day during combined SVE/AS.

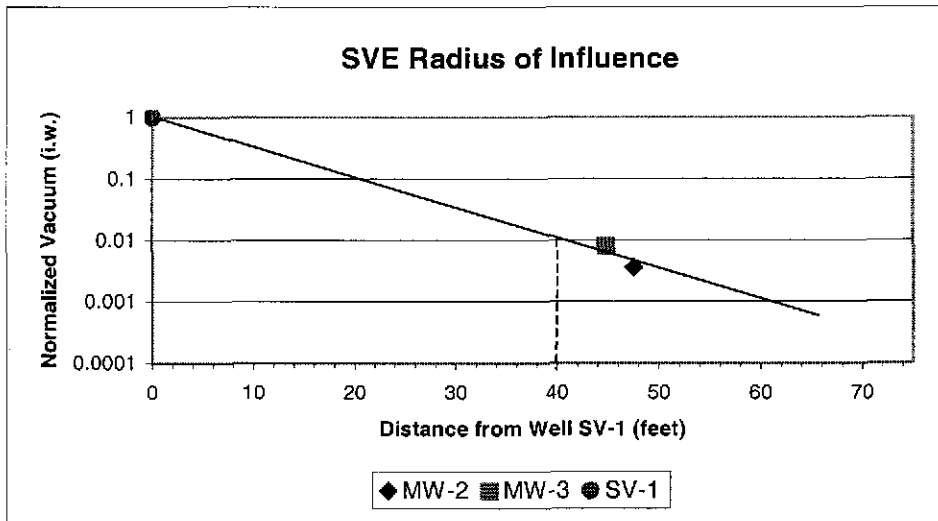
As anticipated, the vacuum radius of influence decreased in all observation wells during air sparging to the point that all observation wells were exhibiting a positive pressure. The effects of sparging into well AS-3 were less pronounced than wells AS-1 and AS-2.

### 3.2 Test Results

**Flow Rates:** During testing, vapor flow rates ranged from 3.5 to 9.2 scfm. Air sparge flow rates ranged 2.5 to 6.0 cfm.

**Radius of Influence:** During testing at the optimal applied vacuum of 64 i.w., a vacuum of 0.22 i.w. was observed in well MW-2, and a vacuum of 0.49 i.w. was observed in well MW-3. No vacuum influence was observed in well MW-6. Observation wells MW-2, MW-3, and MW-6 are located approximately 47, 45, and 63 feet away from extraction well SV-1, respectively. The effective radius of vacuum influence was estimated according to *A Summary of Nationwide Vapor Extraction System Performance Study* (T.E. Buscheck, T. R. Peargin, November 1991). This approach involves normalizing the vacuum data by dividing the vacuum observed in monitoring points by the vacuum applied to the extraction wellhead. The log of the normalized vacuum data is then plotted against the distance to the observation wells. The effective radius of influence is frequently considered to be the distance corresponding to 1% of the normalized vacuum. As shown on the graph below, the theoretical effective radius of vacuum influence was approximately 40 feet, using the maximum vacuum measurements from the observation wells.

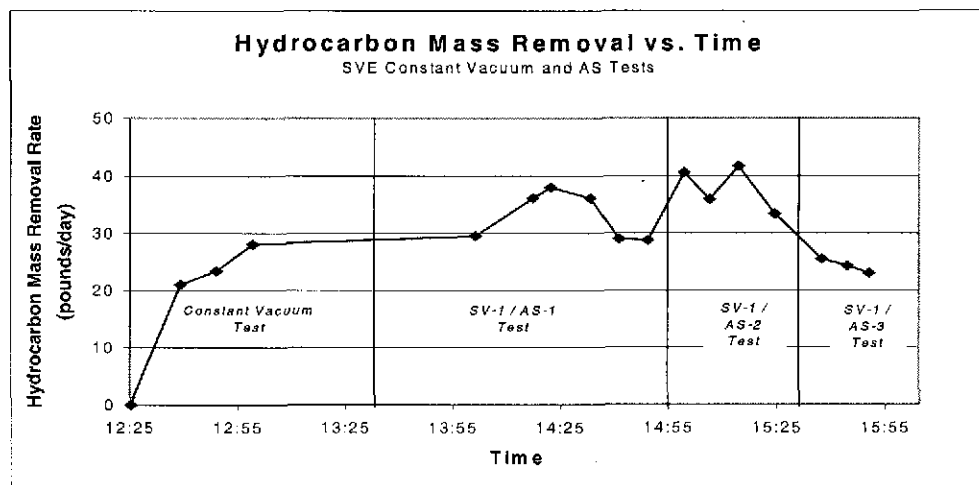




However, using an alternative convention, the radius of influence could be considered greater than 47 feet, where a measurable vacuum response was recorded in an observation well. No vacuum influence was observed in well MW-6, due to potential short-circuiting along the utilities located in Webster Street.

**Hydrocarbon Vapor Concentrations:** Analytical results from the soil vapor sample collected indicates that significant hydrocarbon vapor concentrations were being extracted. The laboratory results for TPHg and benzene were 35,000 and 490 µg/L, respectively. No MTBE was detected above the laboratory detection limits of 200 µg/L. Analytical results for vapor samples are included in Appendix C. Field measurements also indicated significant hydrocarbon vapor extraction and that the hydrocarbon concentrations significantly increased due to the introduction of air sparging.

**Estimated Hydrocarbon Removal:** During the constant vacuum test, the estimated vapor-phase hydrocarbon removal rate from well SV-1 ranged from approximately 21 to 28 lbs/day. With the



introduction of air sparging to well AS-1, the removal rate increased to approximately 33 lbs/day. With the introduction of air sparging to well AS-2, the removal rate increased to approximately 38 lbs/day. See Table 2 and the graph above of hydrocarbon mass removal versus time.

#### 4.0 CONCLUSIONS

Based on site conditions and the feasibility test results, Cambria concludes the following:



- High hydrocarbon concentrations (up to 22,500 ppmv) and removal rates (up to 42 lbs/day) indicate there is a significant mass of hydrocarbons remaining in the subsurface.
- The higher than anticipated hydrocarbon concentrations, necessitates the use of soil vapor extraction to capture the hydrocarbon vapors generated during air sparging. Based on current site conditions, a biosparge approach would be inadequate to remediate the site, but may be appropriate after hydrocarbon concentrations have been reduced.
- SVE and AS are effective technologies to remediate both the hydrocarbon-impacted soil and groundwater beneath the site.
- SVE and AS can be used to remediate a relatively large area as indicated by vacuum radius of influence measurements. Additional SVE wells would be needed to fully capture hydrocarbon vapors generated during air sparging.

#### 5.0 RECOMMENDATIONS

Cambria recommends that a SVE/AS remediation system be used to remediate the remaining hydrocarbons in soil and groundwater. Our proposed remediation system would include the following:

- Extracting hydrocarbon vapors from the existing wells SV-1, MW-2, and MW-3 using an applied vacuum of approximately 60 i.w. Wells MW-2 and MW-3 would need to be reconstructed with an appropriate well screen interval from 10 to 30 ft bgs.
- Injecting air into existing air sparge wells AS-1, AS-2, and AS-3 at a low flow rate of approximately 2.5 cfm.

- Treating extracted hydrocarbon vapors with an internal combustion engine or a catalytic oxidizer until treatment by granular activated carbon becomes more cost effective.
- Conducting SVE/AS until system influent concentrations have reached asymptotic levels, or until benzene concentrations in site groundwater decrease to below Environmental Screening Levels (ESLs).

## 6.0 SCHEDULE



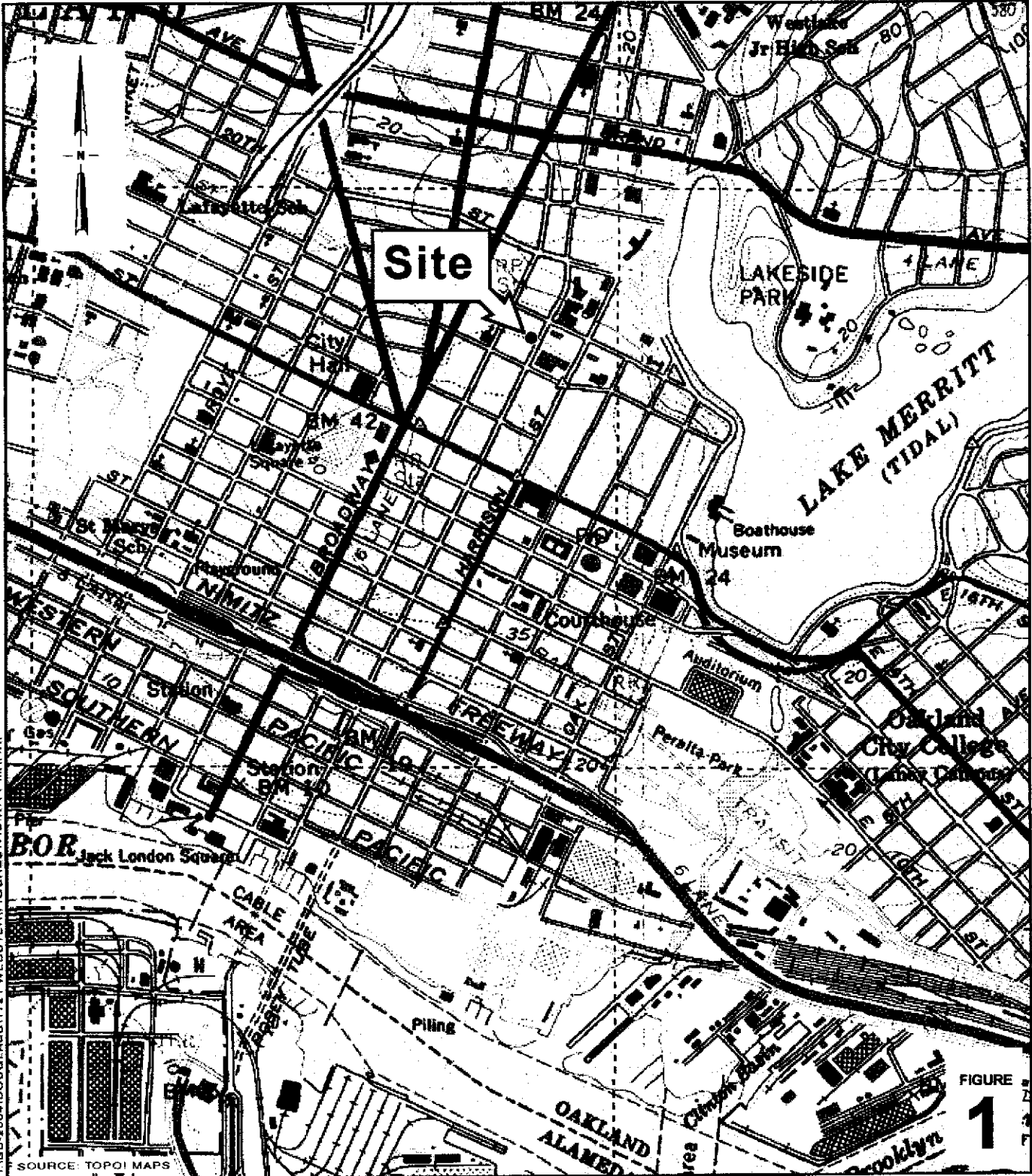
Upon approval of this Feasibility Test Report, Cambria will complete the system design, acquire the necessary system permits, and install the system. These tasks are described in detail below.

**System Design Plans:** Cambria will prepare system design plans and submit them to the agency for review and approval. Following approval, Cambria will prepare a bid package that will be sent to at least three contractors.

**Air Discharge Permits:** Cambria will prepare an application to obtain an air discharge permit from the Bay Area Air Quality Management District.

**System Installation:** Following planning approval and receipt of a building permit, Cambria will select the most appropriate bidder and coordinate the following activities: system permitting, trenching and piping installation, well reconstruction, equipment procurement, and connection of remediation equipment. Cambria will also coordinate the installation of an electrical service. If the service is unavailable, Cambria will evaluate alternatives for operating the SVE/AS system.

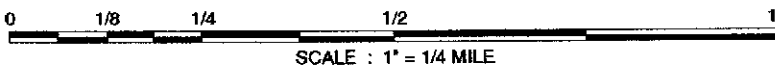
**Design Contingencies:** The recommended system design is contingent upon obtaining City approval to trench within the sidewalk, obtaining the necessary electrical service, minimizing the disruption to existing businesses, and obtaining an air discharge permit that accounts for the ventilation of treated soil vapors.



H:\SB-2004\DOUGLASS\1721 WEBSTER\FIGURE\VICINITY-MAP.A1

SOURCE: TOPOI MAPS

FIGURE 1



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

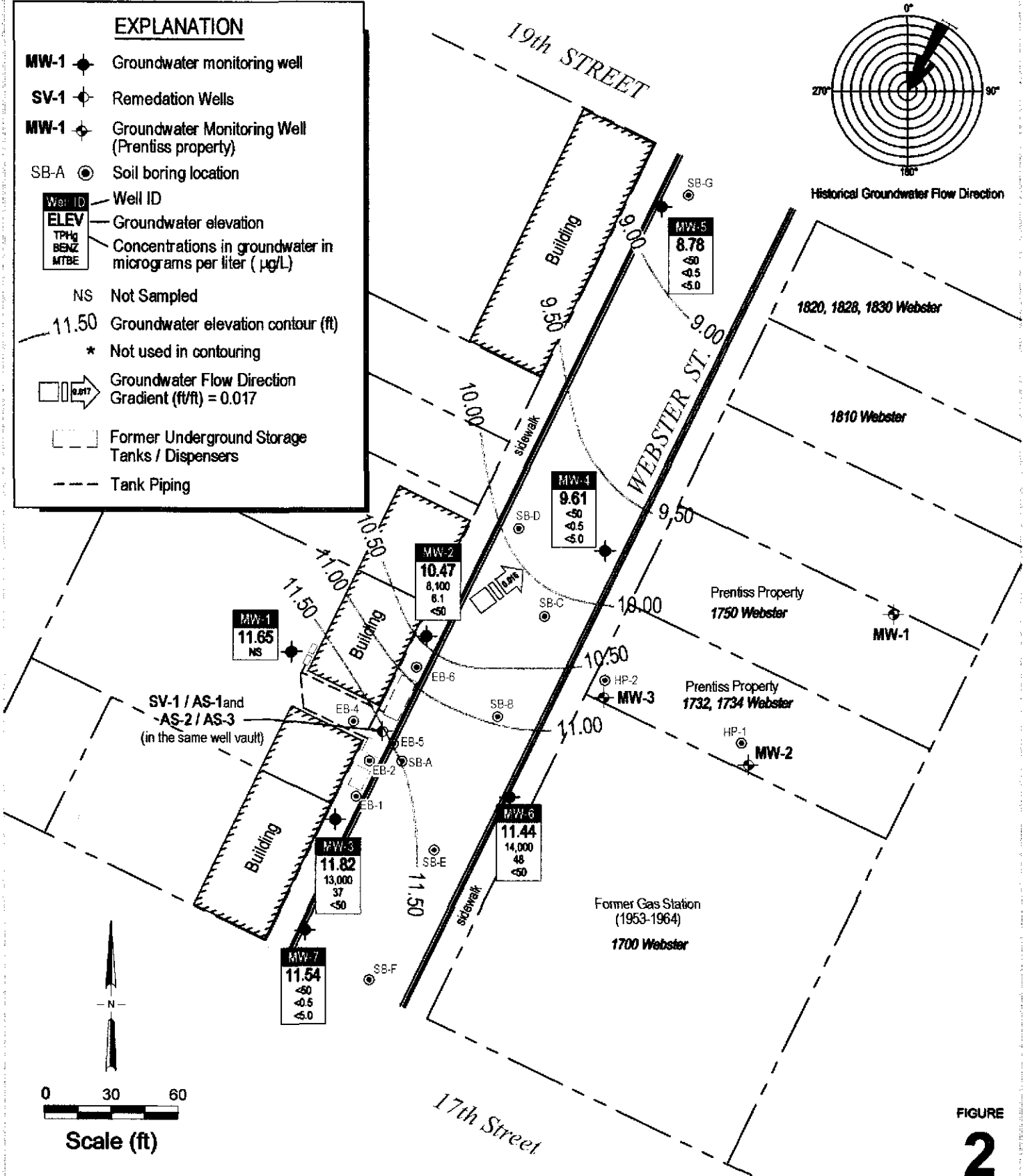
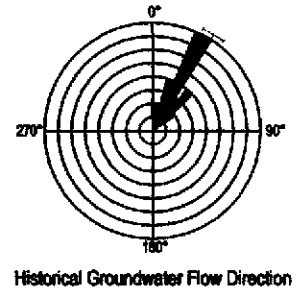


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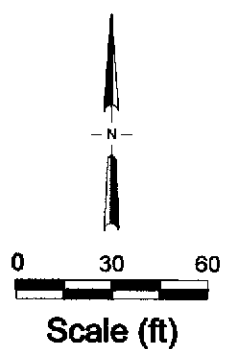
Vicinity Map

**EXPLANATION**

- MW-1 Groundwater monitoring well
- SV-1 Remediation Wells
- MW-1 Groundwater Monitoring Well (Prentiss property)
- SB-A Soil boring location
- Well ID Well ID
- ELEV Groundwater elevation
- TPHg  
BENZ  
MTBE Concentrations in groundwater in micrograms per liter (µg/L)
- NS Not Sampled
- 11.50 Groundwater elevation contour (ft)
- \* Not used in contouring
- Groundwater Flow Direction  
Gradient (ft/ft) = 0.017
- Former Underground Storage Tanks / Dispensers
- Tank Piping



H:\SB-2004\DOUGLAS PARKING\1721 WEBSTER\FIGURES\QMS-IP JL.DWG



Base map from Piers Environmental Services

FIGURE  
**2**

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



**Groundwater Elevation and  
Hydrocarbon Concentration Map**  
January 15, 2004

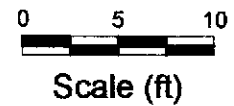
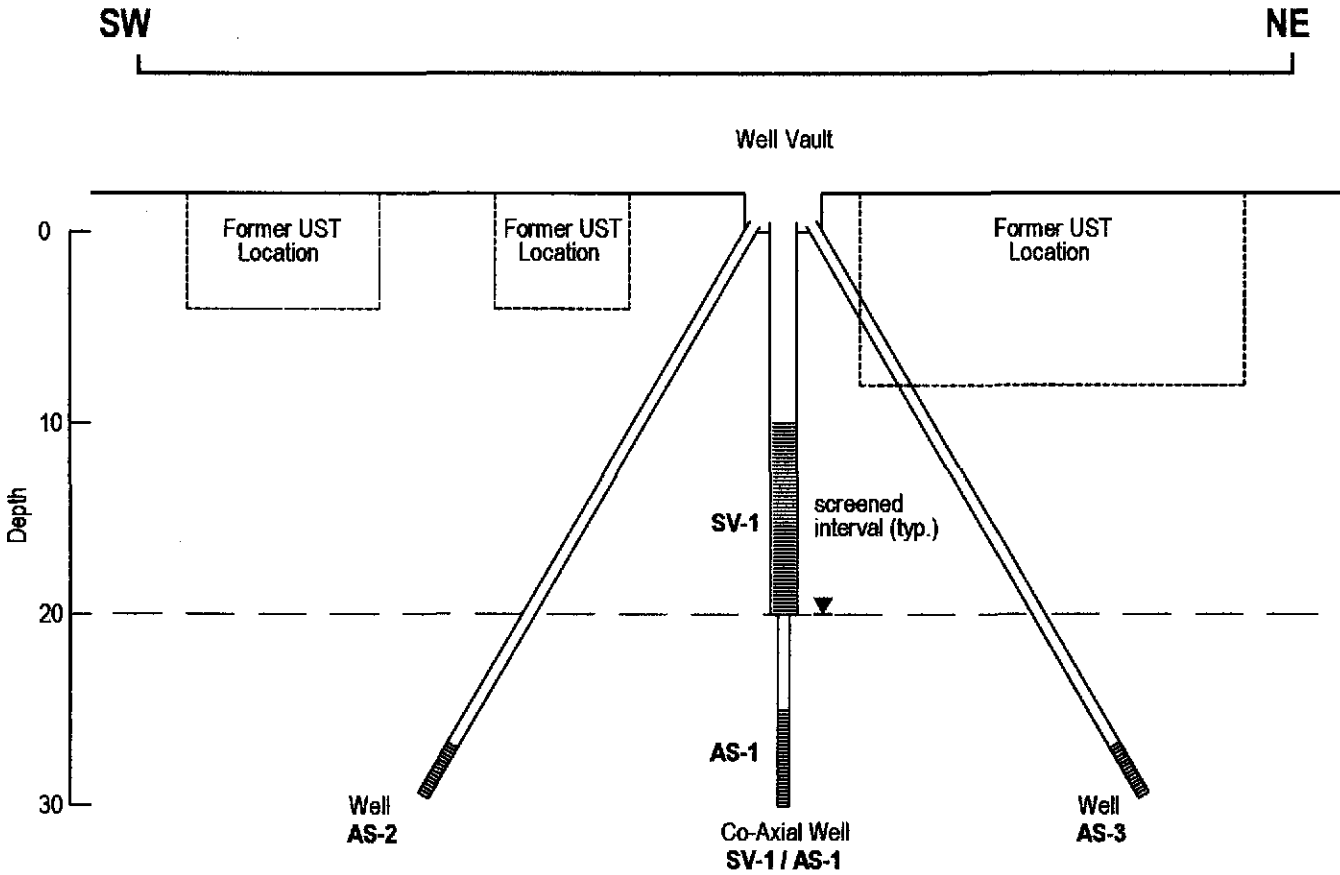


FIGURE 3

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



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**Profile of Remediation Wells**

# CAMBRIA

**Table 1. Soil Analytical Data - Douglas Parking Company, 1721 Webster Street, Oakland, California**

Boring/ Well ID	Date	Sample Depth (ft bgs)	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
<i>Parker Environmental - UST and Piping Excavation</i>							
T-1	8/3/1992	9	150	2.2	2.9	1.8	13
T-2	8/3/1992	9	120	0.62	0.56	0.87	2.2
T-3	8/6/1992	8	580	1.7	5.9	5.6	43
T-4	8/6/1992	8	1,500	11	140	48	280
T-5	8/6/1992	8	410	6.7	22	6.2	35
T-6	8/6/1992	12	1,400	12	70	29	150
T-7	8/6/1992	14	2.3	0.11	0.19	0.050	0.31
SW1	8/6/1992	9.5	280	2.9	5.8	3.2	15
SW2	8/6/1992	7	1,500	5.7	40	18	150
SW3	8/6/1992	8	400	2.7	5.8	4.0	21
SW4	8/6/1992	9	2.3	0.42	0.028	0.077	0.18
L-1	8/3/1992	1.5	2.6	<0.5	0.010	<0.5	0.030
L-2	8/3/1992	1.5	<50	<0.5	<0.5	<0.5	<0.5
L-3	8/3/1992	1.5	<50	<0.5	<0.5	<0.5	<0.5
L-4	8/3/1992	1.5	<50	<0.5	<0.5	<0.5	<0.5
L-5	8/3/1992	2.0	8.2	0.010	0.020	0.012	0.092
L-6	8/3/1992	2.0	<50	<0.5	0.007	<0.5	0.034
<i>Gen Tech - Soil Borings &amp; Wells</i>							
EB-1	7/8/1994	10	ND	--	--	--	--
EB-1	7/8/1994	15	ND	--	--	--	--
EB-1	7/8/1994	20	trace	--	--	--	--
EB-1	7/8/1994	25	trace	--	--	--	--
EB-1	7/8/1994	30	ND	--	--	--	--
EB-2	7/8/1994	10	trace	--	--	--	--
EB-2	7/8/1994	15	600	--	--	--	--
EB-2	7/8/1994	20	500	--	--	--	--
EB-2	7/8/1994	25	1,000	--	--	--	--
EB-2	7/8/1994	30	ND	--	--	--	--
EB-3	7/8/1994	2	ND	--	--	--	--
EB-3	7/8/1994	5	trace	--	--	--	--
EB-3	7/8/1994	10	100	--	--	--	--
EB-3	7/8/1994	15	trace	--	--	--	--
EB-3	7/8/1994	20	100	--	--	--	--
EB-3	7/8/1994	30	ND	--	--	--	--
EB-4	7/8/1994	10	ND	--	--	--	--
EB-4	7/8/1994	15	trace	--	--	--	--
EB-4	7/8/1994	20	trace	--	--	--	--
EB-4	7/8/1994	30	ND	--	--	--	--

# CAMBRIA

**Table 1. Soil Analytical Data - Douglas Parking Company, 1721 Webster Street, Oakland, California**

Boring/ Well ID	Date	Sample Depth (ft bgs)	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
EB-5	7/8/1994	2	100	--	--	--	--
EB-5	7/8/1994	5	1,000	--	--	--	--
EB-5	7/8/1994	10	800	--	--	--	--
EB-5	7/8/1994	15	1,000	--	--	--	--
EB-5	7/8/1994	20	500	--	--	--	--
EB-5	7/8/1994	30	ND	--	--	--	--
EB-6	7/8/1994	10	ND	--	--	--	--
EB-6	7/8/1994	15	trace	--	--	--	--
EB-6	7/8/1994	20	1,000	--	--	--	--
EB-6	7/8/1994	30	ND	--	--	--	--
MW-1	9/8/1993	NA	--	--	--	--	--
MW-2	9/8/1993	NA	--	--	--	--	--
MW-3	9/8/1993	NA	--	--	--	--	--
<i>Cambria Environmental Technology, Inc. - Borings and Wells</i>							
SB-A	2/22/1996	19.5	<1.0	<0.005	0.007	<0.005	<0.005
SB-B	2/22/1996	20.5	580	<0.3	1.3	1.8	4.2
SB-C	2/22/1996	19.5	1.4	<0.005	0.013	0.027	0.12
SB-D	2/22/1996	20.5	660	<0.2	2.3	<0.2	5.2
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
MW-6	6/27/2003	20.0	220	<0.10	0.14	<0.10	0.35
MW-7	6/27/2003	NS	--	--	--	--	--

**Notes and Abbreviations**

Benzene, Toluene, Ethylbenzene, and Xylenes by EPA Method 8021B

TPHg = Total petroleum hydrocarbons as gasoline per Modified EPA Method 8015

<n = not detected above the laboratory reporting limit.

-- = Not analyzed or not available

NA = Not Available

NS = Not Sampled

ft bgs = feet below ground surface

mg/kg = milligrams per kilograms



# CAMBRIA

**Table 2. Groundwater Elevation and Analytical Data**

Douglas Parking Company, 1721 Webster Street, Oakland, CA

Well ID (TOC)	Date	Depth to Water (ft)	Groundwater Elevation (ft)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-1	12/2/1994	19.42	9.83	ND	ND	ND	ND	ND	-
29.25	3/6/1995	20.69	9.04	ND	ND	ND	ND	ND	-
29.73	7/11/1995	20.65	9.16	ND	ND	ND	ND	ND	-
29.81	5/10/1996	20.80	9.01	ND	ND	ND	ND	ND	-
	10/2/1996	21.35	8.46	-	-	-	-	-	-
	2/28/1997	20.57	9.24	-	-	-	-	-	-
	9/16/1997	21.50	8.31	-	-	-	-	-	-
	2/5/1998	20.91	8.90	-	-	-	-	-	-
	8/11/1998	20.50	9.31	-	-	-	-	-	-
	2/8/1999	21.42	8.39	-	-	-	-	-	-
	2/24/1999	22.99	6.82	-	-	-	-	-	-
	3/3/1999	20.84	8.97	-	-	-	-	-	-
	3/10/1999	20.89	8.92	-	-	-	-	-	-
	3/17/1999	20.84	8.97	-	-	-	-	-	-
	5/4/1999	20.80	9.01	-	-	-	-	-	-
	7/20/1999	21.25	8.56	-	-	-	-	-	-
	10/5/1999	21.37	8.44	-	-	-	-	-	-
	1/7/2000	21.65	8.16	-	-	-	-	-	-
	4/6/2000	21.05	8.76	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/31/2000	21.13	8.68	-	-	-	-	-	-
	10/3/2000	21.69	8.12	-	-	-	-	-	-
	1/12/2001	22.00	7.81	-	-	-	-	-	-
	4/11/2001	22.16	7.65	-	-	-	-	-	-
	7/6/2001	22.57	7.24	-	-	-	-	-	-
	10/25/2001	22.71	7.10	-	-	-	-	-	-
	3/4/2002	22.53	7.28	-	-	-	-	-	-
	4/18/2002	22.81	7.00	-	-	-	-	-	-
	7/9/2002	22.95	6.86	-	-	-	-	-	-
	10/4/2002	23.13	6.68	-	-	-	-	-	-
	1/12/2003	22.05	7.76	-	-	-	-	-	-
	4/21/2003	21.17	8.64	-	-	-	-	-	-
32.75	7/21/2003	21.39	11.36	-	-	-	-	-	-
	10/2/2003	21.64	11.11	-	-	-	-	-	-
	1/15/2004	21.10	11.65	-	-	-	-	-	-
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

# CAMBRIA

**Table 2. Groundwater Elevation and Analytical Data**

Douglas Parking Company, 1721 Webster Street, Oakland, CA

Well ID (TOC)	Date	Depth to Water (ft)	Groundwater Elevation (ft)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-2 (cont'd)	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
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
MW-3 29.50 29.25 29.56	12/2/1994	22.15	7.35	394,000	1,200	ND	1,800	4,000	-
	3/6/1995	20.09	9.16	21,000	400	150	24	62	-
	7/11/1995	19.99	9.57	12,000	ND	10	16	99	-
	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

# CAMBRIA

**Table 2. Groundwater Elevation and Analytical Data**

Douglas Parking Company, 1721 Webster Street, Oakland, CA

Well ID (TOC)	Date	Depth to Water (ft)	Groundwater Elevation (ft)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-4	5/10/1996	16.98	8.31	14,000	ND	1,200	720	3,100	-
25.29	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
MW-5	5/10/1996	14.60	7.37	ND	ND	ND	ND	ND	-
21.97	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
	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

# CAMBRIA

**Table 2. Groundwater Elevation and Analytical Data**

Douglas Parking Company, 1721 Webster Street, Oakland, CA

Well ID (TOC)	Date	Depth to Water (ft)	Groundwater Elevation (ft)	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-5 (cont'd)	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
	6/30/2003	19.60	11.39	68,000	950	6,000	2,400	10,000	<1,000
	30.99	7/21/2003	19.67	11.32	120,000	170	1,400	1,100	10,000
MW-6	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
	6/30/2003	21.40	11.71	170	<0.5	2.1	2.0	8.7	<5.0
33.11	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
Trip Blank	01/12/01	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	4/11/2001	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	7/6/2001	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	3/4/2002	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0
	10/2/2003	-	-	<50	<0.5	<0.5	<0.5	<0.5	<5.0

**Notes and Abbreviations:**

\* = Well inaccessible

µg/L = micrograms per liter

ND = Not Detected

<nd = Below laboratory detection limit

DO = dissolved oxygen

TOC = top of casing elevations in feet above mean sea level

ft-msl = feet above mean sea level

TPHg = Total petroleum hydrocarbons as gasoline by modified EPA Method 8015

Benzene, Toluene, Ethylbenzene, and Xylenes by EPA Method 8020

MTBE = methyl tertiary butyl ether by EPA Method 8021B, and by EPA Method 8260 in parenthesis

a = Unmodified or weakly modified gasoline is significant.

b = Heavier gasoline range compounds are significant (aged gasoline?).

c = No recognizable pattern.

Data prior to 7/11/95 from Gen Tech and Piers Environmental Quarterly Groundwater Monitoring Reports dated December 2, 1994 and March 6, 1995, respectively.

Sampling no longer required in well MW-1 per September 17, 1996, ACDEH letter to Douglas Parking.

On July 31, 2003, Virgil Chavez Land Surveying of Vallejo, California surveyed monitoring wells using a benchmark in the top of the curb near the SW return of the NW corner of 34th and Broadway

# CAMBRIA

**Table 3. Soil Vapor Extraction / Air Sparge Pilot Test Summary - Douglas Parking, 1721 Webster St, Oakland, California, October 4, 2003**

Test Well									Observation Well		
Time	Applied Vacuum	Vapor Flow Rate	Air Sparge Pressure	Air Sparge Flow Rate	HC Conc.	O <sub>2</sub> Conc.	TPHg Conc.	HC Removal Rate	Vacuum MW-2	Vacuum MW-3	Vacuum MW-6
	(in. H <sub>2</sub> O)	(scfm)	(psi)	(cfm)	Horiba (ppmv)	Horiba (%)	Lab (ppmv)	(lbs/day)	(i.w.)	(i.w.)	(i.w.)
<b>SV-1 Startup Sampling</b>									<i>Distance from Well SV-1:</i>		
10:00	Startup										
10:15	79	5.6	--	--	10,050	--	35,000	21.4	--	--	--
10:20	79	--	--	--	--	--	--	--	0.31	>0.50	0.0
10:40	139	9.2	--	--	40	--	--	0.1	>0.50	1.15	0.00
<b>SV-1 Step Vacuum Test</b>											
10:45	21	6.7	--	--	7,850		--	20	0.38*	0.7*	0.00
10:54	--	--	--	--	8,800	11.15	--	--	0.19	--	--
10:58	35	5.5	--	--	14,500	7.06	--	30	0.19	0.31	0.00
11:15	50	3.9	--	--	12,900	8.80	--	19	0.15	0.40	0.00
11:24	63	5.3	--	--	10,100	11.44	--	20	0.18	0.45	0.00
11:34	64	5.6	--	--	10,100	11.52	--	21	0.22	0.49	--
11:53	82	5.0	--	--	6,850	14.70	--	13	0.28	0.50	--
12:06	102	4.9	--	--	3,400	18.28	--	6	0.28	0.51	0.005
12:20	102	6.9	--	--	47	21.36	--	0.1	0.31	0.56	0.005
<b>SV-1 Constant Vacuum Test</b>											
12:26	65	--	--	--	--	--	--	--	--	--	--
12:40	61	6.4	--	--	8,700	12.44	--	21	0.22*	0.39*	--
12:50	61	6.6	--	--	9,300	11.86	--	23	0.17	0.31	--
13:00	61	8.5	--	--	8,700	12.36	--	28	0.17	0.30	--
<b>SV-1 Constant Vacuum / AS-1 Step Air Sparge Test</b>											
13:30	--	--	28	6	(air sparge breakout pressure)			--	--	--	-0.21
14:00	65	--	--	--	--	--	--	--	--	--	--
14:02	64	4.0	--	--	19,500	12.44	--	30	--	--	--
14:10	61	--	5.0	2.5	16,900	--	--	--	--	--	--
14:18	61	5.6	5.0	2.7	17,000	13.12	--	36	0.37	0.14	0.00
14:23	60	5.9	2.5	2.5	17,000	13.32	--	38	0.23	0.15	0.00
14:29	61	--	13.0	5.0	17,700	14.56	--	--	0.02	0.14	0.00
14:34	61	5.2	13.0	5.0	18,300	15.66	--	36	0.01	0.07	0.00
14:42	60	4.2	15.0	6.0	18,000	17.00	--	29	-0.03	-0.11	0.00
14:50	60	4.2	15.0	6.0	18,000	18.00	--	29	-0.04	-0.19	0.00
<b>SV-1 Constant Vacuum / AS-2 Step Air Sparge Test</b>											
15:00	60	4.9	6.0	3.0	21,900	15.76	--	41	-0.02	-0.31	0.00
15:07	60	4.2	5.0	2.8	22,500	13.62	--	36	-0.1	-0.20	
15:15	60	4.9	15.0	6.0	22,500	11.00	--	42	-0.02	-0.29	0.00
15:25	60	4.3	14.0	5.8	20,500	10.75	--	33	0.005	-0.72	0.00
<b>SV-1 Constant Vacuum / AS-3 Step Air Sparge Test</b>											
15:38	60	3.5	10.0	3.0	19,000	9.92	--	26	-0.02	-0.41	0.00
15:45	60	3.7	9.0	3.0	17,300	10.38	--	24	-0.01	-0.12	0.00
15:51	60	3.7	15.0	6.0	16,400	10.02	--	23	-0.01	0.00	0.00

**NOTES:**

-- = Not Recorded/Not Applicable

scfm = standard cubic feet per minute

ppmv = parts per million by volume

lbs/day = pounds per day

\* = Measurements reflect residual vacuum influence from previous test.

Negative vacuum values indicate pressure.

HC Vapor Removal Rate (lbs/day) = 
$$\frac{\text{Hydrocarbon Vapor Conc. (field measured)} \times \text{Flow (scfm)} \times \text{Molecular Weight (100 lb/lb-mole)} \times 1 \text{ lb-mole} \times 60 \text{ (min/hr)} \times 24 \text{ (hrs/day)}}{379 \text{ cfm} \times 1000000}$$

C A M B R I A



**APPENDIX A**

Agency Letter



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

September 23, 2003

Lee Douglas  
Douglas Parking  
1721 Webster Street  
Oakland, CA 94612-3411

Dear Mr. Douglas:

Subject: Fuel Leak Case No. RO0000129, Douglas Parking, 1721 Webster Street,  
Oakland, CA 94612-3411

Alameda County Environmental Health (ACEH) staff has reviewed the Leaking Underground Storage Tank Oversight Program file including "Work Plan Addendum - Proposed Feasibility Testing" dated August 12, 2003 by Cambria Environmental Technology. We request that you address the following technical comments and send us the technical reports requested below.

#### TECHNICAL COMMENTS

1. Site Characterization – 16,000 micrograms/liter (ug/l) Total Petroleum Hydrocarbons-Gasoline (TPH-G), 20,000 ug/l TPH-G, and 16,000 ug/l TPH-G, were detected in soil borings, SB-A, SB-B, and SB-C, respectively, located east of the former underground tanks, on February 22, 1996. East of these borings, grab groundwater samples, HP-1 and HP-2, detected 18,000 ug/l and 46 ug/l benzene, respectively, on March 19, 1993. The HP-1 and HP-2 samples were noted in "Subsurface Investigation Report" dated July 16, 1996 by Cambria Environmental Technology. These samples were collected by Applied Geosciences, Inc. In the Cambria report, TPH-G grab groundwater concentrations, the depths at which the samples were collected, and boring logs were not provided. The missing information will help determine if the plume needs to be further defined east of the borings. Please provide.
2. Source Characterization – 580 mg/kg and 680 mg/kg TPH-G were detected at soil borings, SB-B, and SB-D, located east and northeast of the former underground tanks, respectively. "Subsurface Investigation Report" dated July 16, 1996 by Cambria Environmental Technology, noted that soil samples collected near the grab groundwater samples HP-1 and HP-2 on May 18, 1993, did not detect TPH-G or benzene at a depth of 20 ft. However, the soil sample locations and boring logs were not provided. The missing information will help determine if the soil contamination needs to be further defined east of the borings. Please provide.

- 3 . Preferential Pathway Survey – We request that you perform a preferential pathway study that details the potential migration pathways and potential conduits (wells, utilities, pipelines, etc.) for horizontal and vertical migration that may be present in the vicinity of the site. Please submit map(s) and cross-sections showing the location and depth of all utility lines and trenches (including sewers, storm drains, pipelines, trench backfill, etc.) within and near the site and plume area(s). Evaluate the probability of the contaminant plumes encountering preferential pathways and conduits that could spread the contamination, particularly in the vertical direction to deeper water aquifers. Please submit. *See to Condition 4*
- 4 . Well Survey – Locate wells within a quarter mile radius of the site. Show the location of the wells and the site on a map and tabulate well construction details for each well. Please submit.
- 5 . Historical Hydraulic Gradients – Please show using a rose diagram with magnitude and direction; include cumulative groundwater gradients in all future reports submitted for this site. *in Addendum 2003 Report*
- 6 . Groundwater Analyses – We request that you include the other fuel oxygenates Tertiary Amyl Methyl Ether (TAME), Ethyl Tertiary Butyl Ether (ETBE), Di-Isopropyl Ether (DIPE), and Tertiary Butyl Alcohol (TBA), Ethanol by EPA Method 8260 and the lead scavengers, Ethylene Dibromide (EDB), Ethylene Dichloride (EDC) for analyses of grab and monitoring well groundwater samples, and for the lead scavengers, EDB and EDC, also perform analyses on soil samples. If any of the latter compounds are detected, and are determined to be of concern (poses a risk to human health, the environment, or water resources) it is to be incorporated into your regular monitoring plan.
- 7 . Proposed Feasibility Testing – A diagram of and procedures for the previously approved soil vapor extraction and air sparging tests have been provided.

#### TECHNICAL REPORT REQUEST

Please submit the following technical reports to Alameda County Environmental Health (Attention: Don Hwang), according to the following schedule:

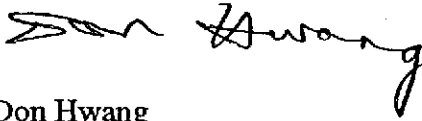
- October 31, 2003 - Groundwater Monitoring Report, Third Quarter 2003
- November 23, 2003 - HP-1 and HP-2 grab groundwater concentrations, depths, and boring logs.
- November 23, 2003 - May 18, 1993 soil sample locations and boring logs
- November 23, 2003 - Preferential Pathway Survey
- November 23, 2003 - Well Survey
- ✓ November 23, 2003 - Soil vapor extraction and air sparging test results
- ✓ January 31, 2004 - Groundwater Monitoring Report, Fourth Quarter 2003
- ✓ April 30, 2004 - Groundwater Monitoring Report, First Quarter 2004
- ✓ July 31, 2004 - Groundwater Monitoring Report, Second Quarter 2004



Mr. Douglas  
September 23, 2003  
Page 3 of 3

These reports are being requested pursuant to the Regional Water Quality Control Board's (Regional Board) authority under Section 13267 of the California Water Code. If you have any questions, please call me at (510) 567-6746.

Sincerely,

A handwritten signature in cursive script that reads "Don Hwang". The signature is written in black ink and is positioned above the typed name.

Don Hwang  
Hazardous Materials Specialist  
Local Oversight Program

✓c: Mary C. Holland-Ford, Cambria Environmental Technology, Inc., 5900 Hollis St., Suite A,  
Emeryville, CA 94608  
Donna Drogos  
File

C A M B R I A



**APPENDIX B**

Soil Boring Logs

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 6"	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.	

QEMP 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 Han	Count	Sample	Depth	Lithology Log	Well Detail/ Backfill
EB-2 @ 5'	-	grab	X	5	Concrete and subgrade GW - Artificial FILL, base material.	
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.	
					CLMP 0641262	

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.						
<i>Handwritten: OLLP CEL 1202</i>						

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.	Blow Count	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.	
			EMP REG 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	X	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	80 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 Colormetric Test for petroleum hydrocarbons in parts per million.	
					CEW/P REG 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'

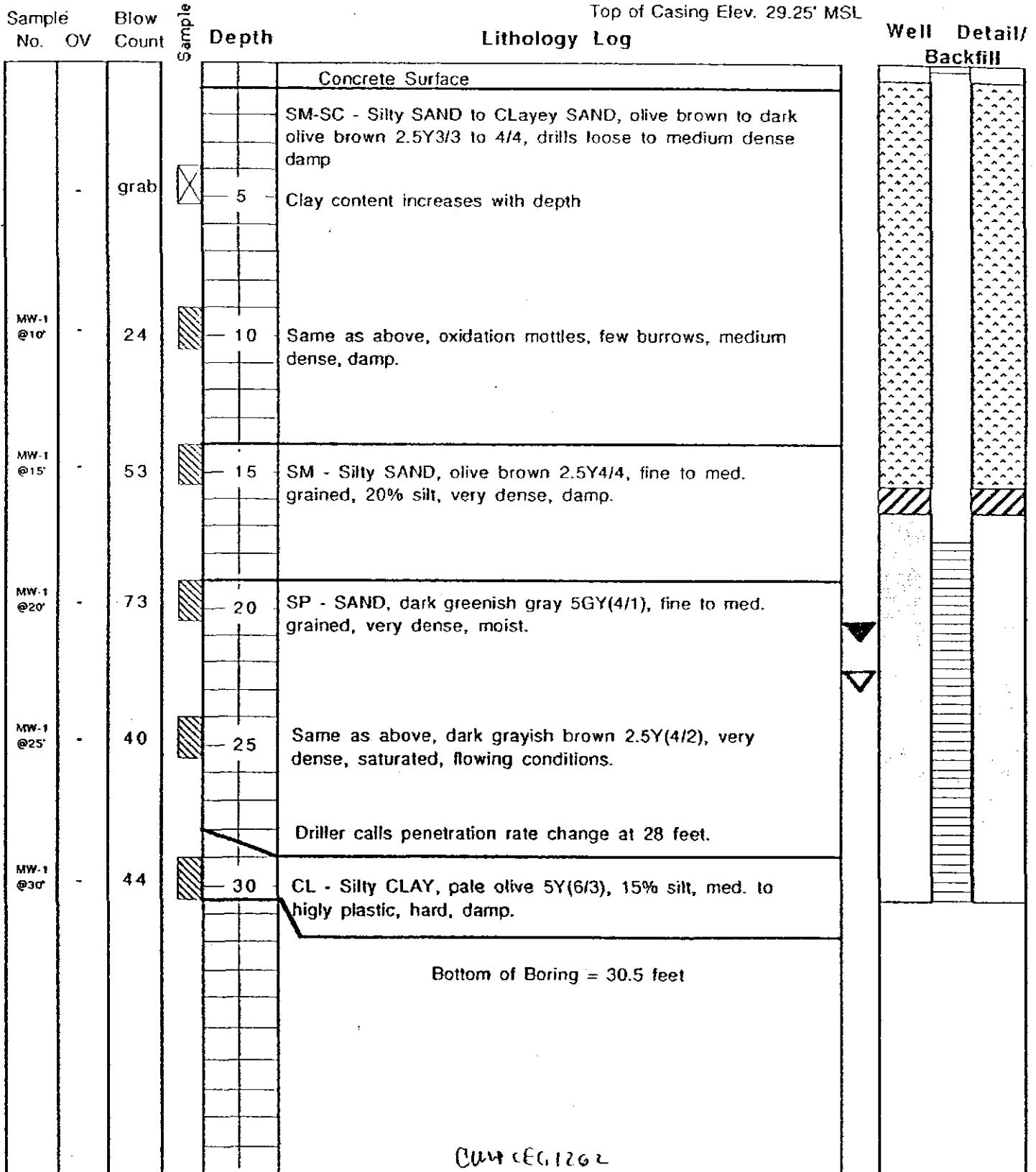
Borehole Completion  
 Well Installed: No  
 Total Depth: 30'  
 Cement Grout Seal: 28' to surface

Sample No.	Blow Han	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.	
					CLUP 2EG 1262	



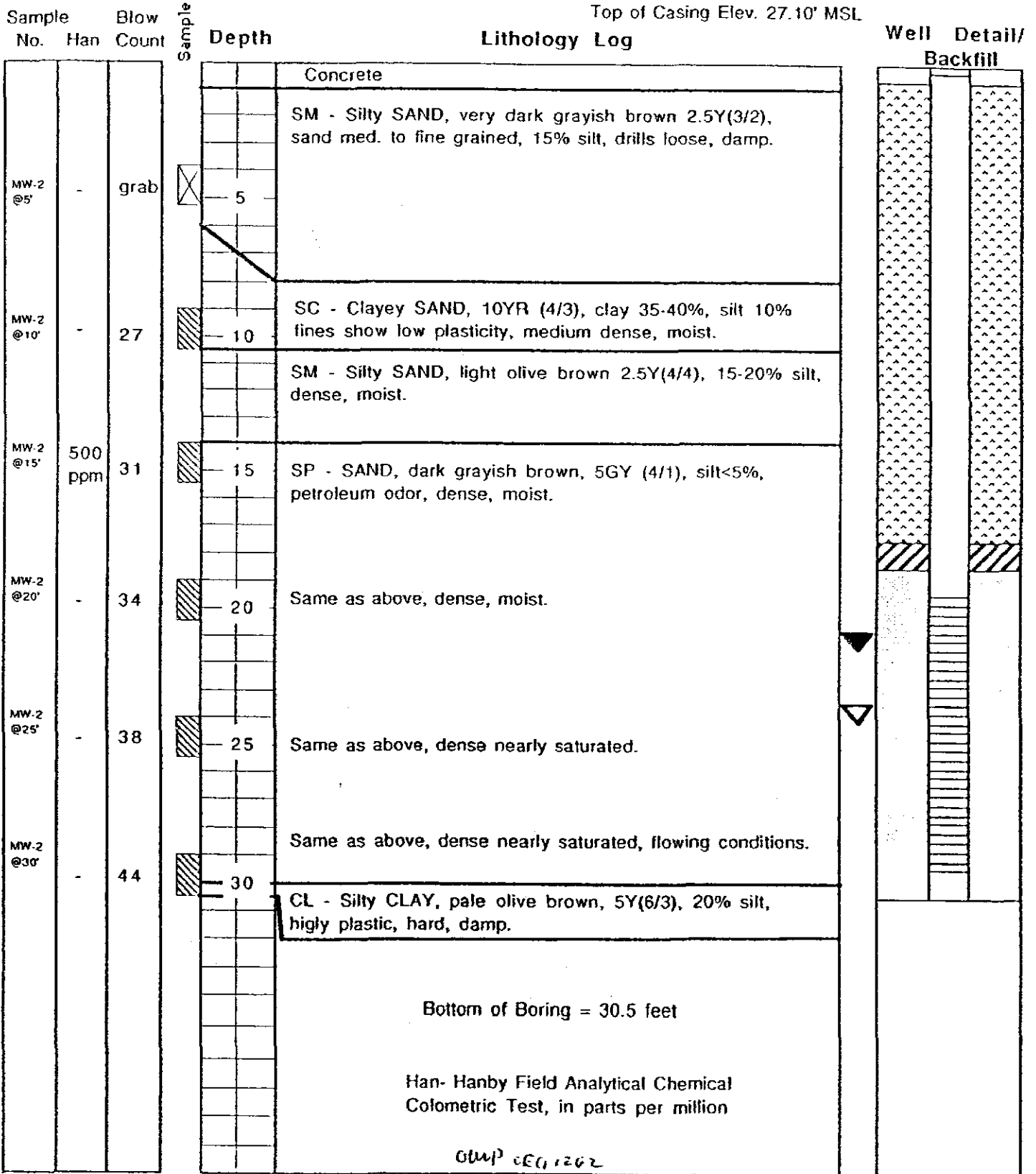
Project No. 9432 Boring/Well No. MW-1  
 Client: Douglas Parking Date Drilled: Sept. 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 #94501  
 Water Levels: 1st Enc: 23' Static: 21.7

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



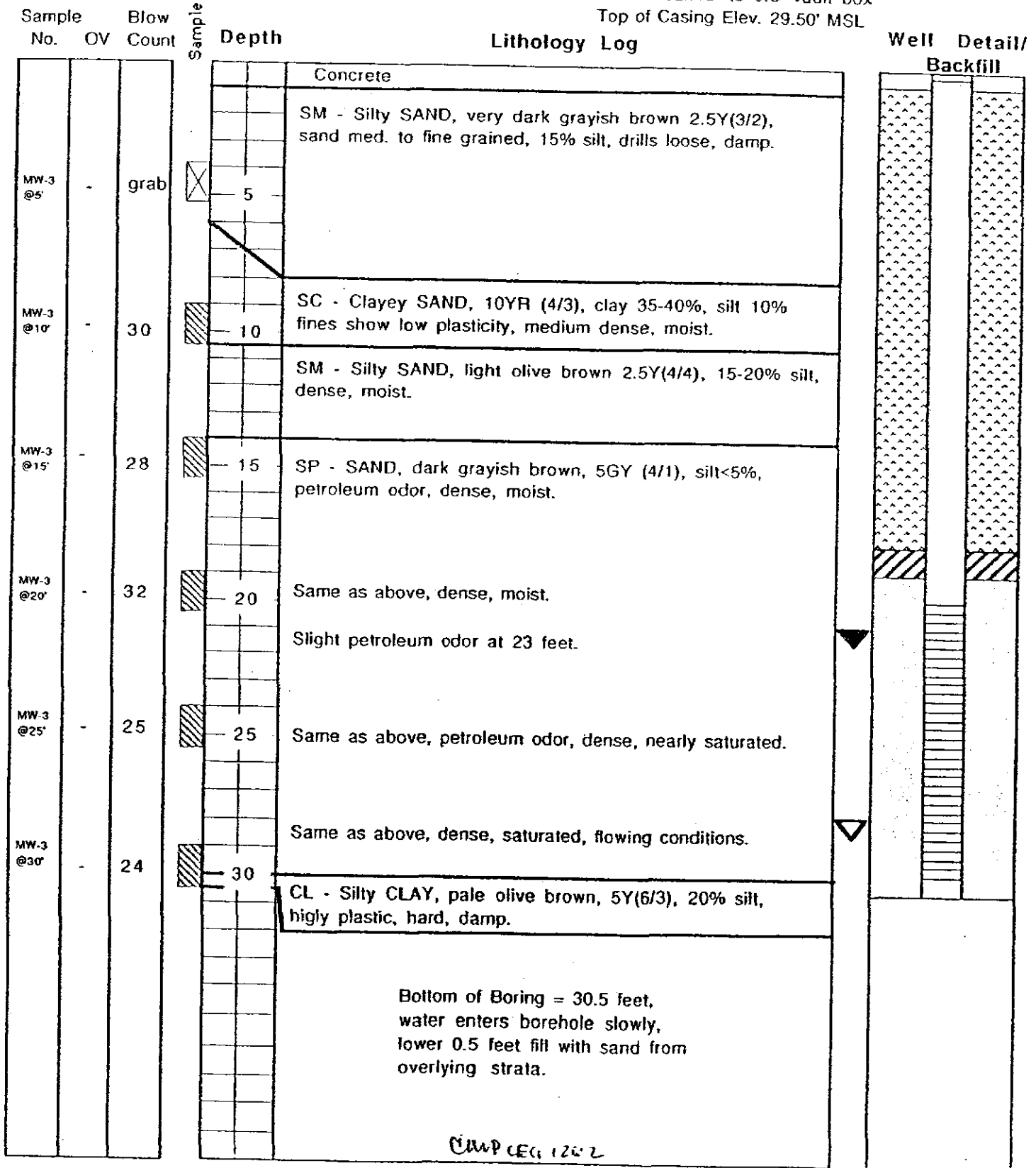
Project No. 9432 Boring/Well No. MW-2  
 Client: Douglas Parking Date Drilled: Sept. 8, 1994  
 Location: 1721 Webster St., Oakland, CA Logged by: EL  
 Drilling Method: Hollowstem Permit: Zone 7 #94501  
 Water Levels: 1st Enc: 24' Static: 20.1'

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



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



CAMP LEG 1202

BORING LOG

Client: **Douglas Parking Company**

Project No: **58-197**

Phase

Task **02**


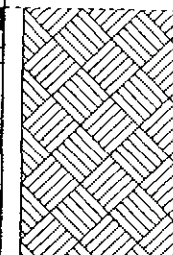
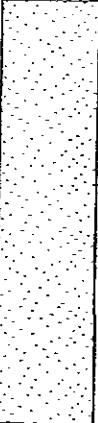
Boring ID

**SB-A**

Location **1721 Webster Street**

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						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	Bottom of boring
30							30	

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

Drilling Started **2/22/96**  
 Drilling Completed **2/22/96**  
 Grout Type **Portland Type I/II**

Notes: **Webster Street in #4 lane near site entrance**

BORING LOG

Client: Douglas Parking Company

Boring ID

SB-B

Project No: 58-197

Phase

Task 02

Location 1721 Webster Street

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		ASPHALT				0	
5			Silty SAND; (SM); brown; damp; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10			moist				10	
15			SAND; (SP); brown; damp; 10% silt, 90% medium grained sand; high estimated permeability				15	
20			grey; wet	580.00			20	
25							25	Bottom of boring
30							30	

Driller Vironex  
 Logged By JME  
 Water-Bearing Zones NA

Drilling Started 2/22/96  
 Drilling Completed 2/22/96  
 Grout Type Portland Type I/II

Notes: Webster Street in #2 lane near site entrance

BORING LOG

Client: **Douglas Parking Company**

Boring ID

SB-C

Project No: **58-197**

Phase

Task **02**

Location **1721 Webster Street**



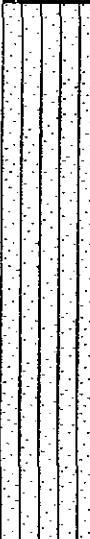
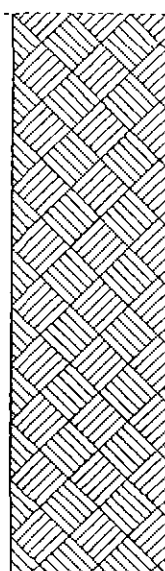

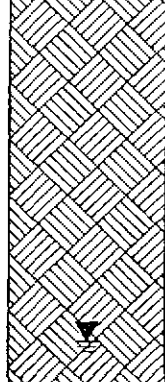

Surface Elev. **NA ft.**

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



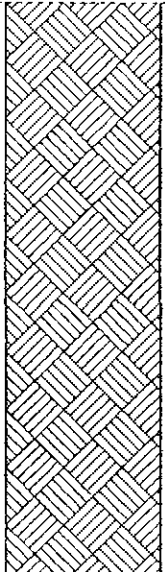
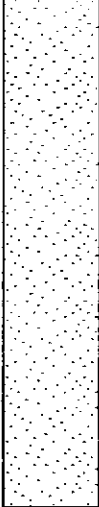
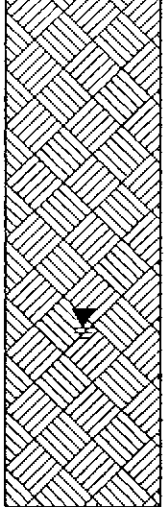

Depth Feet	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Boring Completion Graphics	Depth Feet	Additional Comments
0	Ground Surface		ASPHALT				0	
5			Silty SAND; (SM); brown; moist; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10			wet				10	
15			SAND; (SP); 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, 34' northeast of MW-2</b>
Logged By <b>JME</b>	Drilling Completed <b>2/22/96</b>	
Water-Bearing Zones <b>NA</b>	Grout Type <b>Portland Type I/II</b>	

BOR 58197 5/21/96

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			Silty SAND; (SM); brown; damp; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5	
10							10	
15			SAND; (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>	

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; 30% silt, 70% fine to medium grained sand; moderate estimated permeability</b>				5	
5							10	
10							15	
			<b>SAND; (SP); brown; damp; 10% silt, 90% medium grained sand; high estimated permeability</b>				15	
15							20	
20			grey; wet	nd			25	
25							30	Bottom of boring

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**

Client: **Douglas Parking Company**

Boring ID

SB-F

Project No: **58-197**

Phase

Task **02**



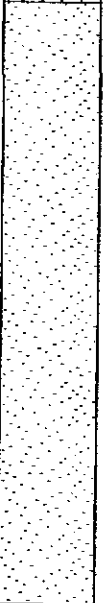
Location **1721 Webster Street**

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						0	
			ASPHALT					
			<b>Silty SAND; (SM);</b> brown; moist; 30% silt, 70% fine to medium grained sand; moderate estimated permeability					
5							5	
10							10	
15			<b>SAND; (SP);</b> brown; moist; 10% silt, 90% medium grained sand; high estimated permeability				15	
20			wet	nd			20	
25							25	Bottom of boring
30							30	

Driller <b>Vironex</b>	Drilling Started <b>2/23/96</b>	Notes: <b>Webster Street in #2 lane near 17th Street crosswalk</b>
Logged By <b>JME</b>	Drilling Completed <b>2/23/96</b>	
Water-Bearing Zones <b>NA</b>	Grout Type <b>Portland Type I/II</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:</b> (SM); brown; damp; 20% silt, 80% fine to medium grained sand; moderate to high estimated permeability					
5							5	
			<b>SAND:</b> (SP); brown; moist; 10% silt, 90% medium grained sand; high estimated permeability					
10							10	
			wet					
15							15	
			wet					
20				nd			20	
								Bottom of boring
25							25	
30							30	

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

Depth (feet)	Blow Count	Sample Interval	Lithologic Description	TPHg (ppm)	Graphic Log	Well Construction Graphics	Depth (feet)	Well Construction Details
0	Ground Surface							T.O.C. Elev. 25.29
0-5			ASPHALT CONCRETE FILL; (ML); light brown; damp; 10% clay, 60% silt, 30% fine to medium grained sand; low plasticity; low estimated permeability				0-5	
5-10	2 4 11		Silty SAND; (SM); brown; medium dense; damp; 30% silt, 70% fine to medium grained sand; moderate estimated permeability				5-10	
10-15	6 11		SAND; (SP); brown; medium dense; damp; 5% silt, 95% medium grained sand; high estimated permeability				10-15	
15-20	6 15		SAND; (SP); brown; medium dense; damp; 5% silt, 95% medium grained sand; high estimated permeability				15-20	
20-25	12 24		grey; wet	1			20-25	
25-30	3 6		loose				25-30	
30-35	6 12 10		Clayey SILT; (ML); grey; very stiff; wet; 20% clay; 50% silt, 30% medium grained sand; medium plasticity; low estimated permeability	nd			30-35	Bottom of well

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

Depth (feet)	Blow Count	Sample Interval	Lithologic Description	TPHG (ppm)	Graphic Log	Well Construction Graphics	Depth (feet)	Well Construction Details
0	Ground Surface							T.O.C. Elev. 21.97
0 - 10			<b>ASPHALT</b> <b>CONCRETE</b>  <b>FILL:</b> (ML); light brown; damp; 10% clay, 60% silt, 30% fine to medium grained sand; low plasticity; low estimated permeability  <b>SAND:</b> (SP); brown; very dense; damp; 5% silt, 95% fine to medium grained sand; high estimated permeability				0 - 10	
10 - 15	6 26 26		moist to wet	nd			10 - 15	
15 - 20	8 26 28						15 - 20	
20 - 25	3 4 4		<b>Clayey SILT:</b> (ML); grey to brown; medium stiff; wet; 20% clay; 50% silt, 30% medium grained sand; medium plasticity; low estimated permeability				20 - 25	
25 - 30	6 10 18			nd			25 - 30	Bottom of well

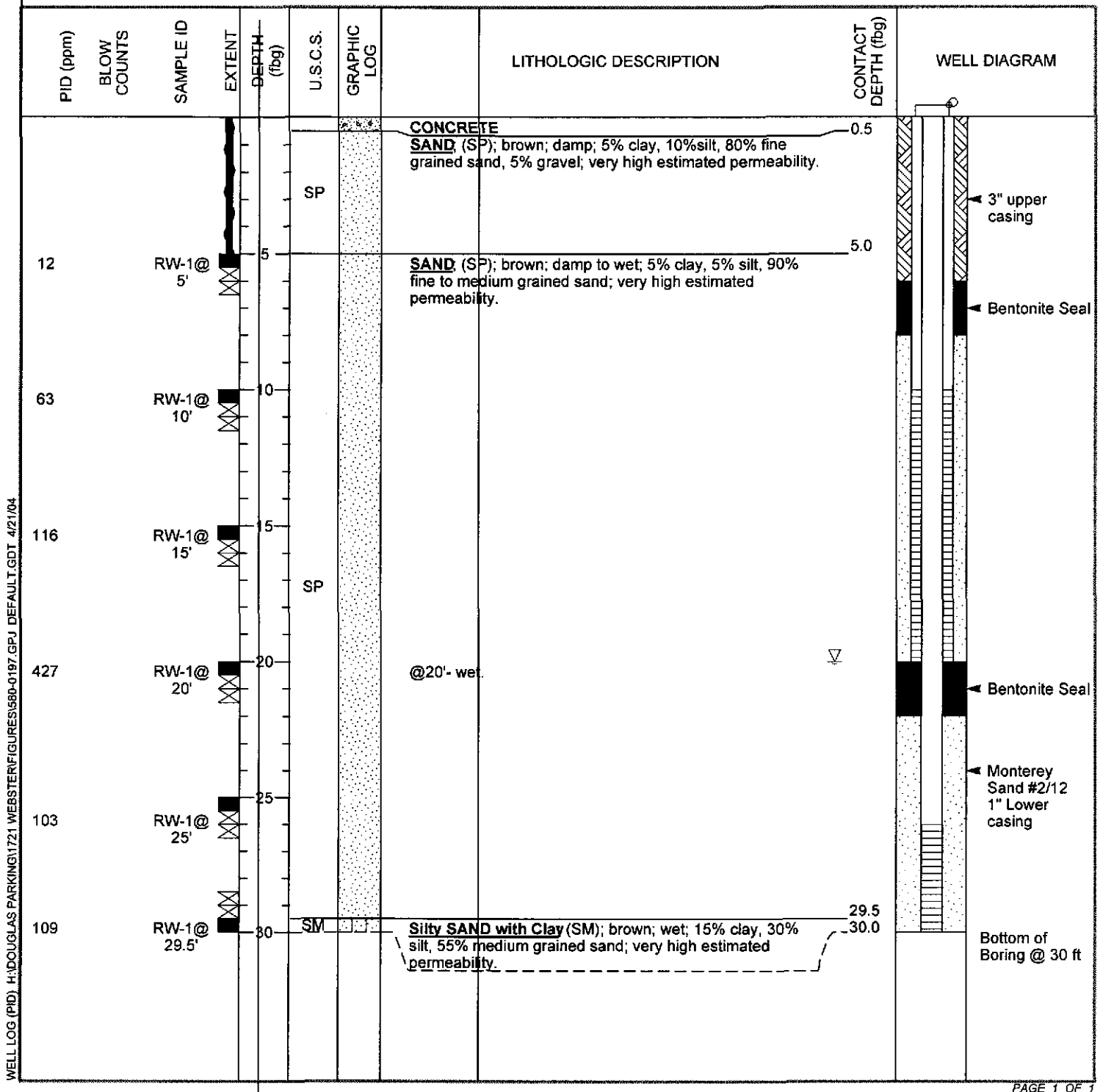
Driller <b>SES, Inc.</b>	Development Yield <b>010</b>	Bentonite Seal <b>8'to 9'</b>
Logged By <b>JME</b>	Well Casing <b>0.52 gpmDia. 0' to 10'</b>	Sand Pack <b>Monterey Sand</b>
Drilling Started <b>5/3/96</b>	Casing Type <b>Schedule 40 PVC</b>	Sand Pack Type <b>#2/16</b>
Drilling Completed <b>5/3/96</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>	



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

# BORING/WELL LOG

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

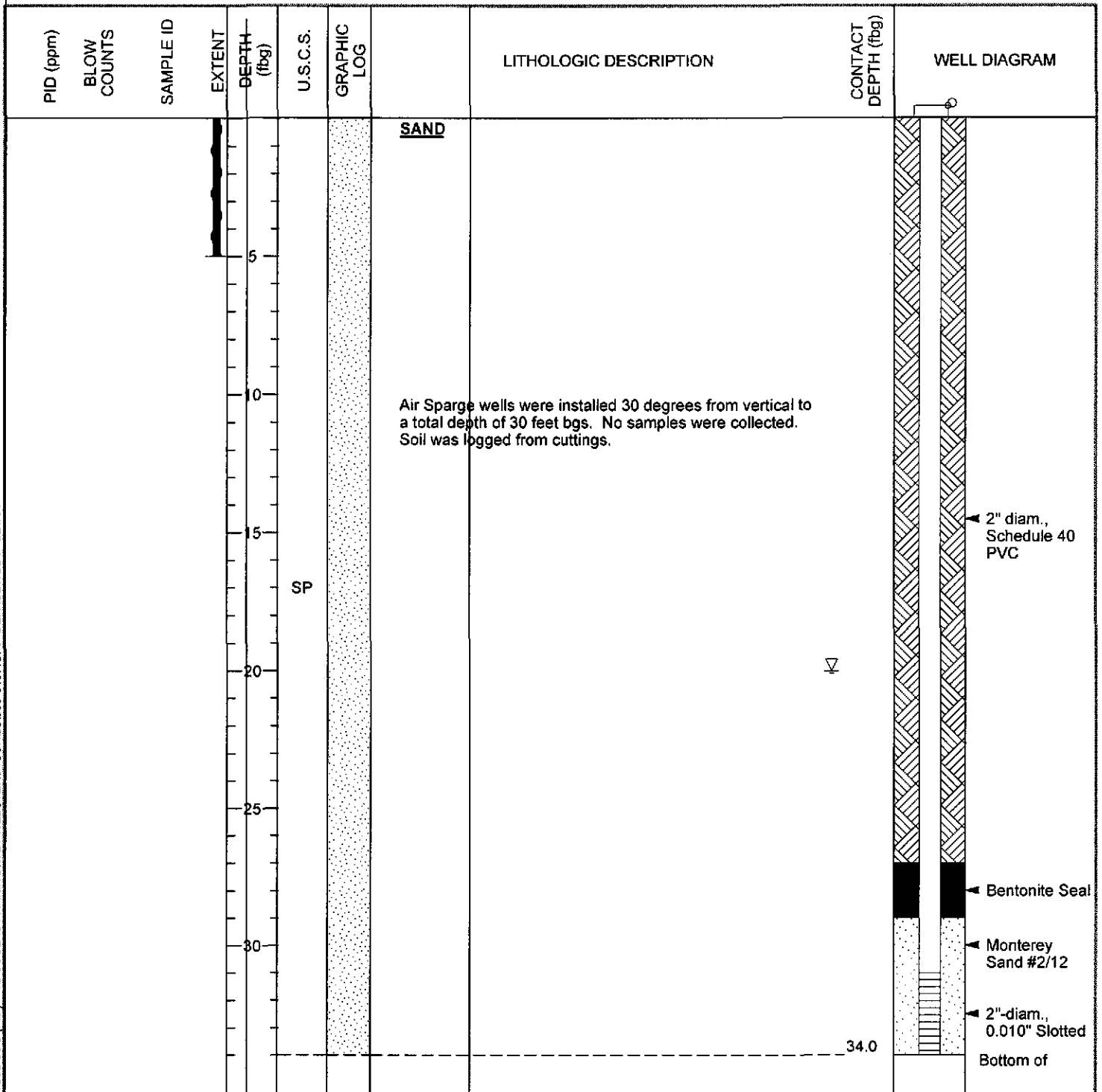




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# BORING/WELL LOG

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\580-0197.GPJ\_DEFAULT.GDT 4/21/04

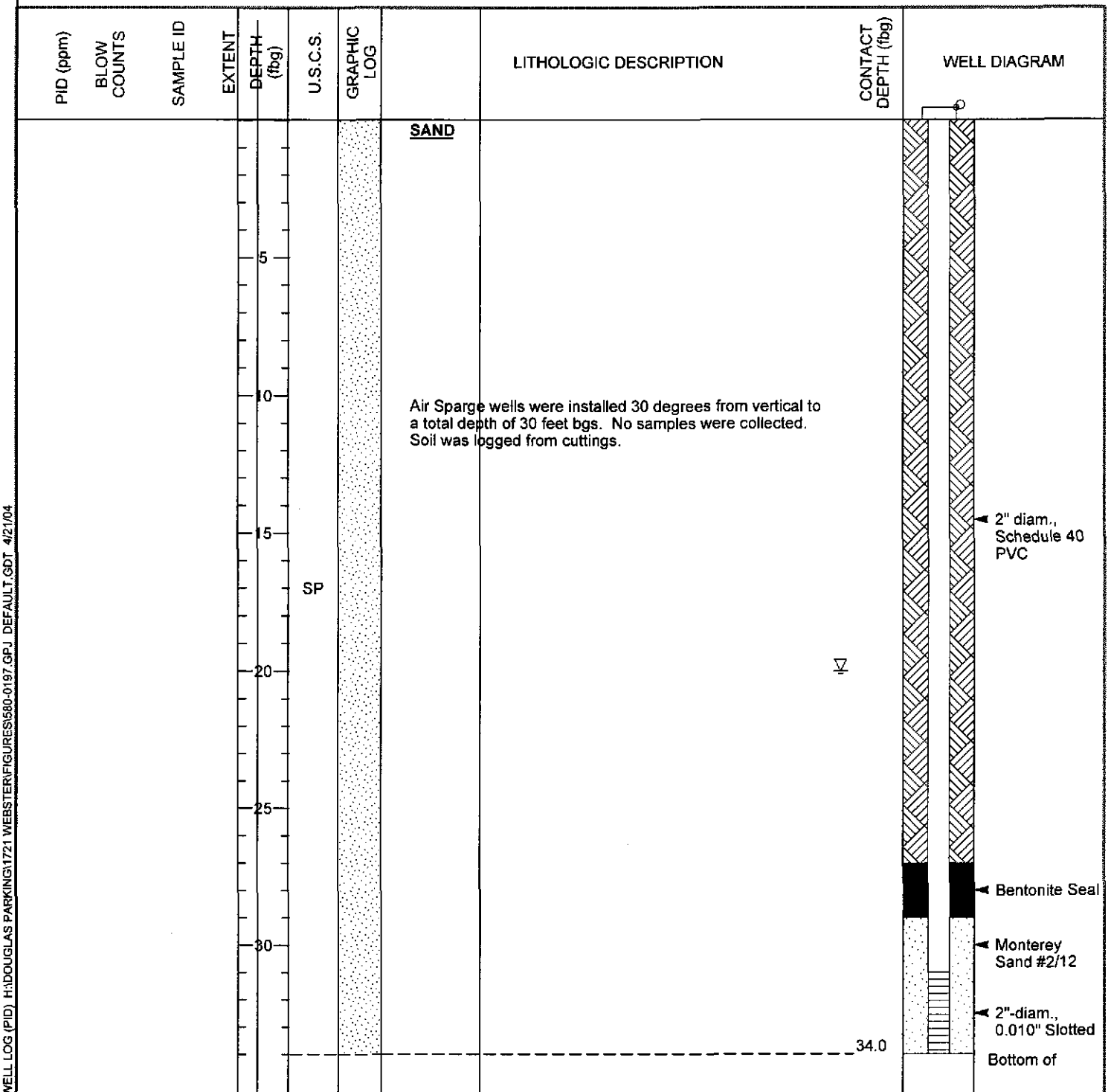
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# BORING/WELL LOG

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)
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.		



Continued Next Page

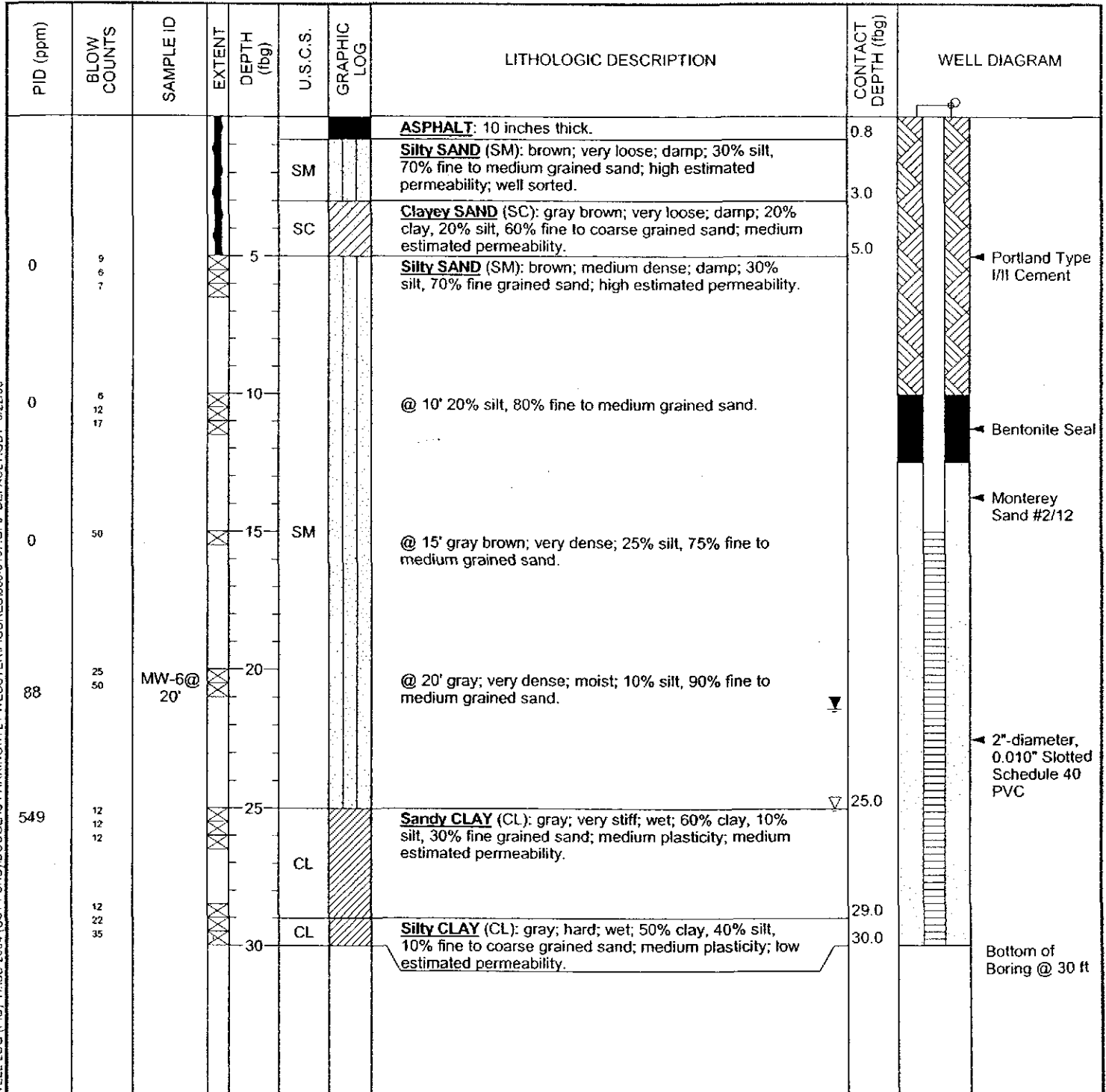
WELL LOG (PID) H:\DOUGLAS PARKING\1721 WEBSTER\FIGURES\580-0197.GPJ\_DEFAULT.GDT 4/21/04



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# 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-stem 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 (UST FUND)\DOUGLAS PARKING\1721 WEBSTER\FIGURES\580-0197.GPJ DEFAULT.GDT 9/22/03

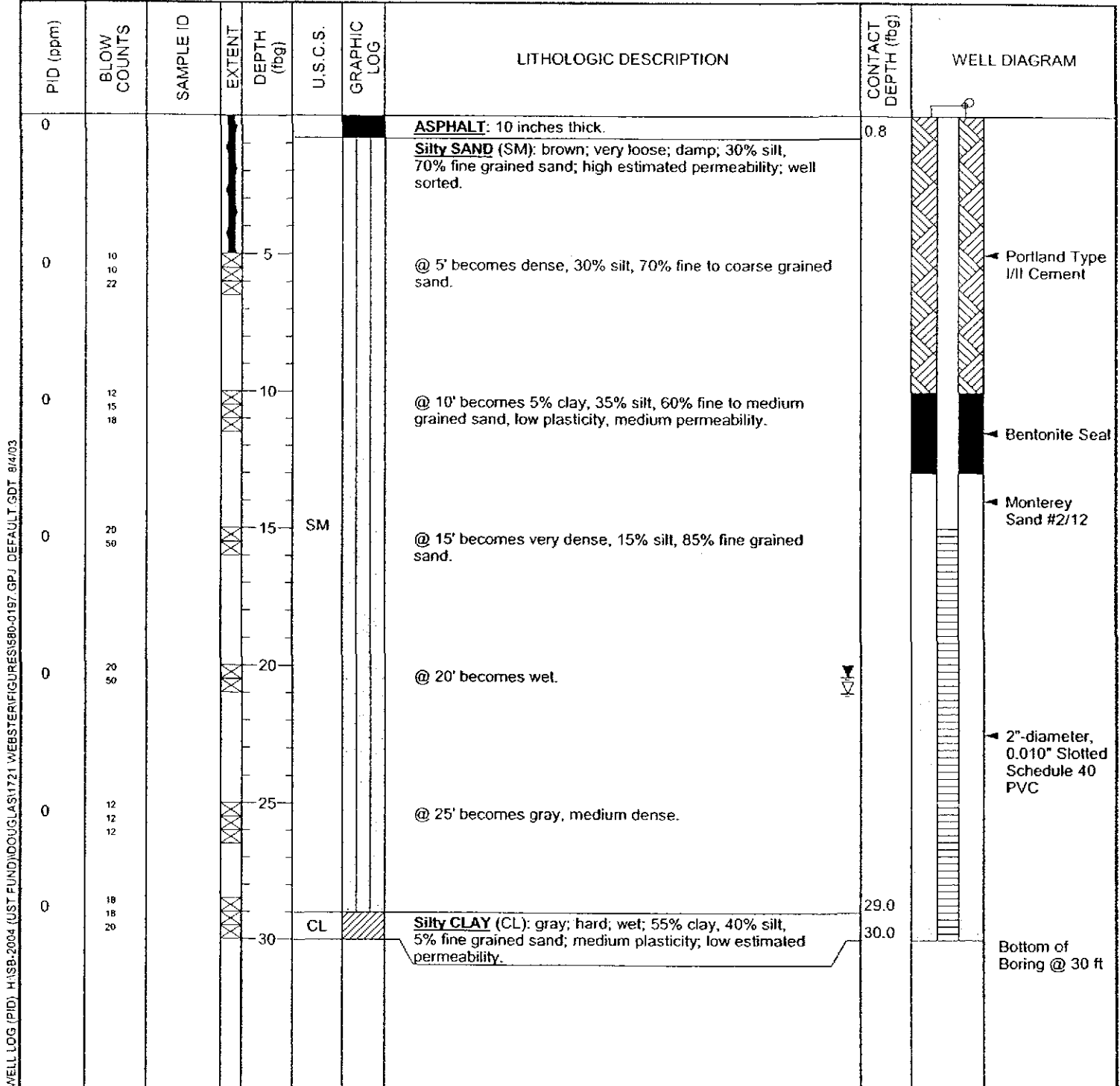




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# BORING/WELL LOG

CLIENT NAME	Douglas Parking Company	BORING/WELL NAME	MW-7
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 (10 gallons)
DRILLER	Woodward Drilling	GROUND SURFACE ELEVATION	Not Surveyed
DRILLING METHOD	Hollow-stem auger	TOP OF CASING ELEVATION	NA
BORING DIAMETER	8"	SCREENED INTERVAL	15 to 30 ft bgs
LOGGED BY	R. Fennell	DEPTH TO WATER (First Encountered)	21.0 ft (27-Jun-03)
REVIEWED BY	Mary C. Holland-Ford R.G. #7551	DEPTH TO WATER (Static)	20.40 ft (27-Jun-03)
REMARKS	Hand augered to 5' bgs.		



WELL LOG (PID): H:\SB-2004 (UST FUND)\DOUGLAS\1721 WEBSTER\FIGURES\580-0197.GPJ DEFAULT.GDT, 8/4/03

C A M B R I A



**APPENDIX C**

Laboratory Analytical Report



McC Campbell Analytical Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

Cambria Env. Technology 5900 Hollis St, Suite A Emeryville, CA 94608	Client Project ID: #580-0197-45; Douglas Parking	Date Sampled: 10/04/03
		Date Received: 10/06/03
	Client Contact: Gretchen Hellmann	Date Reported: 10/10/03
	Client P.O.:	Date Completed: 10/10/03

**WorkOrder: 0310080**

October 10, 2003

Dear Gretchen:

Enclosed are:

- 1). the results of 1 analyzed sample from your **#580-0197-45; Douglas Parking project**,
- 2). a QC report for the above sample
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions please contact me. McC Campbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager



**McC Campbell Analytical Inc.**

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
 http://www.mcccampbell.com E-mail: main@mcccampbell.com

Cambria Env. Technology  5900 Hollis St, Suite A  Emeryville, CA 94608	Client Project ID: #580-0197-45; Douglas Parking	Date Sampled: 10/04/03
	Client Contact: Gretchen Hellmann	Date Received: 10/06/03
	Client P.O.:	Date Extracted: 10/06/03
		Date Analyzed: 10/06/03

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE\***

Extraction method: SW5030B

Analytical methods: SW8021B/8015Cm

Work Order: 0310080

Lab ID	Client ID	Matrix	Benzene	Ethylbenzene	MTBE	Toluene	TPH(g)	Xylenes	DF	% SS
001A	SVE-1-5"	A	490	110	ND<200	260	35,000,a	530	20	109

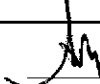
Reporting Limit for DF =1; ND means not detected at or above the reporting limit	A	0.25	0.25	2.5	0.25	25	0.25	1	µg/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

\* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

 Angela Rydelius, Lab Manager



**QC SUMMARY REPORT FOR SW8021B/8015Cm**

Matrix: A

WorkOrder: 0310080

EPA Method: SW8021B/8015Cm		Extraction: SW5030B		BatchID: 8819		Spiked Sample ID: N/A				
	Sample	Spiked	MS*	MSD*	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(btex) <sup>£</sup>	N/A	60	N/A	N/A	N/A	104	103	1.56	70	130
MTBE	N/A	10	N/A	N/A	N/A	98.9	103	3.67	70	130
Benzene	N/A	10	N/A	N/A	N/A	103	104	1.17	70	130
Toluene	N/A	10	N/A	N/A	N/A	104	105	0.734	70	130
Ethylbenzene	N/A	10	N/A	N/A	N/A	106	106	0	70	130
Xylenes	N/A	30	N/A	N/A	N/A	110	107	3.08	70	130
%SS:	N/A	100	N/A	N/A	N/A	102	104	1.58	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
 NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / (MS + MSD) \* 2.

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

**McC Campbell Analytical Inc.**

**CHAIN-OF-CUSTODY RECORD**



110 Second Avenue South, #D7  
Pacheco, CA 94553-5560  
(925) 798-1620

WorkOrder: 0310080

**Client:**

Cambria Env. Technology  
5900 Hollis St, Suite A  
Emeryville, CA 94608

TEL: (510) 420-0700  
FAX: (510) 420-3394  
ProjectNo: #580-0197-45; Douglas Parking  
PO:

*Date Received:* 10/6/03  
*Date Printed:* 10/6/03

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests			
					V8021B/8015C			
0310080-001	SVE-1-5"	Air	10/4/03 10:15:00 AM	<input type="checkbox"/>	A			

**Prepared by: Melissa Valles**

**Comments:**

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

02/0

0310080

McCAMPBELL ANALYTICAL INC.  
110 2<sup>ND</sup> AVENUE SOUTH, #D7  
PACHECO, CA 94553-3560

Telephone: (925) 798-1620

Fax: (925) 798-1622

### CHAIN OF CUSTODY RECORD

TURN AROUND TIME:

RUSH  24 HOUR  48 HOUR  5 DAY

EDF Required?  Yes  No

Report To: Gretchen Hellmann Bill To: SAME  
 Company: CAMBRIA ENVIRONMENTAL TECHNOLOGY, INC.  
 5900 HOLLIS STREET - SUITE A  
 EMERYVILLE, CA 94608 E-mail: ghellmann@cambria-env.com  
 Tele: 510 420-0700 Fax: 510 420-9170  
 Project #: 580-0197-45 Project Name: DOUGLAS DARLING  
 Project Location: 1721 WEBSTER, OAKLAND, CA  
 Sampler Signature: [Signature]

Analysis Request		Other	Comments
BTEX & TPH as Gas (602/8020 + 8013)/MTBE			
TPH as Diesel (8015)			
Total Petroleum Oil & Grease (5520 E&F/B&F)			
Total Petroleum Hydrocarbons (418.1)			
EPA 601 / 8010			
BTEX ONLY (EPA 602 / 8020)			
EPA 608 / 8080			
EPA 608 / 8080 PCB's ONLY			
EPA 624 / 8240 / 8260			
EPA 625 / 8270			
PAH's / PNA's by EPA 625 / 8270 / 8310			
CAM-17 Metals			
LUFT 5 Metals			
Lead (7240/7421/239 216010)			
RCI			

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED								
		Date	Time			Water	Soil	Air	Sludge	Other	Ice	HCl	HNO <sub>3</sub>	Other					
SVE-1-5 <sup>N</sup>		10/14/03	10:15	1	Bag		X												

Relinquished By: [Signature] Date: 10/14/03 Time: 5PM Received By: Saved Location

Relinquished By: [Signature] Date: 10/6 Time: 1125 Received By: Steve Broy Ultra 234

Relinquished By: [Signature] Date: 10/6 Time: 1612 Received By: [Signature]

Remarks:

APPROPRIATE CONTAINERS PRESERVED IN LAB	GOOD HEAD SPACE ABSENT	DECONTAMINATED IN LAB	VOID	GOOD	OTHER	OTHER
---	------------------------	-----------------------	------	------	-------	-------

ICP/GOOD CONDITION