RO2855

Denis L. Brown

Shell Oil Products US
HSE – Environmental Services
20945 S. Wilmington Ave.
Carson, CA 90810-1039
Tel (707) 865 0251
Fax (707) 865 2542
Email denis.l.brown@shell.com

September 14, 2005

Jerry Wickham
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Subsurface Investigation and Monitoring Well Installation Work Plan
Shell-branded Service Station
3600 Park Boulevard
Oakland, California
SAP Code 135689
Incident #98995747

Dear Mr. Wickham:

Attached for your review and comment is a copy of the *Subsurface Investigation and Monitoring Well Installation Work Plan* for the above referenced site. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

If you have any questions or concerns, please call me at (707) 865-0251.

Sincerely,

Denis L. Brown
Sr. Environmental Engineer

CAMBRIA

September 14, 2005

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

Re: **Subsurface Investigation and Monitoring Well Installation Work Plan**
Shell-branded Service Station
3600 Park Boulevard
Oakland, California
Incident # 98995747
Cambria Project #247-0937-007

Dear Mr. Wickham:

On behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell), Cambria Environmental Technology, Inc. (Cambria) has prepared this *Subsurface Investigation and Monitoring Well Installation Work Plan* in response to the July 27, 2005 letter from the Alameda County Health Care Services Agency (ACHCSA). To assess the extent of hydrocarbon-impacted soil and to determine if contaminated groundwater is present at the site, Cambria proposes a soil and discrete-depth groundwater investigation to vertically profile the site's lithology and to determine the nature and extent of contamination. Cambria also proposes the installation of three monitoring wells to provide groundwater monitoring at the site. Also, as requested, an additional report found in Shell's and Cambria's files is included as Attachment A.

SITE CHARACTERISTICS AND HISTORY

Location: The site is an operating Shell-branded service station located at the Park Boulevard and Chatham Road intersection in Oakland, California. The area surrounding the site is both commercial and residential. Interstate 580 is located across Chatham Road opposite the site's southwestern boundary (Figure 1). The service station layout includes a station building, four dispenser islands, and a gasoline underground storage tank (UST) complex (Figure 2).

1998 Upgrade Soil Sampling: In February 1998, secondary containment was added to the existing dispensers and the turbine sumps. Cambria inspected the dispenser and tank pit areas. No field indications of hydrocarbons, such as staining or odor, were observed beneath dispensers D-3 or D-4 during the site visit. Since the City of Oakland Fire Department did not require

Cambria Environmental Technology, Inc.

5900 Hollis Street
Suite A
Emeryville, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

sampling at dispensers during 1998 upgrade projects unless there was evidence of hydrocarbons, no sampling was required for these dispensers. Cambria personnel observed staining and odor beneath dispensers D-1 and D-2, and collected soil samples beneath these dispensers at depths of approximately 2 feet into native soil. A second sample was collected from beneath dispenser D-2 at a depth of approximately 5 feet into native soil. Table 1 summarizes the analytical results. On March 5, 1998, Shell filed an Underground Storage Tank Unauthorized Release Site Report. Cambria's April 7, 1998 *Dispenser Soil Sampling Report* documents these results. A copy of this report is included as Attachment A.

2004 Well Survey: At Shell's request, Cambria performed a well survey for all water-producing wells within a 1/2-mile radius of the site. As shown on Figure 1, Cambria's search of the California Department of Water Resources and Geotracker database records did not return any records of water-producing wells within the search radius.

2004 Upgrade Activities: Paradiso Mechanical, Inc. (Paradiso) of San Leandro, California upgraded fuel dispensers in late June through mid-July 2004. Paradiso upgraded under-dispenser containment at the dispensers and installed enhanced vapor recovery equipment and improved sumps on the UST fuel fill ports. At the direction of the City of Oakland Fire Services Agency, Cambria collected soil samples within 1 to 2 feet of native soil beneath each dispenser on August 20, 2004 (Figure 2). Four soil samples were collected at depths ranging from 4 to 5 feet below grade (fbg) (Figure 2). Laboratory analysis of the samples indicated the presence of hydrocarbons in soils in and around the dispenser locations (Table 1). As a result, Shell filed an Underground Storage Tank Unauthorized Release Report Form with the City of Oakland Fire Department on August 24, 2004. Cambria's October 15, 2004 *Dispenser Upgrade Sampling Report* includes details of the upgrade sampling.

PROPOSED SCOPE OF WORK

Cambria proposes advancing eight borings using direct-push technology to investigate the vertical and lateral extent of petroleum hydrocarbons in soil and groundwater beneath the site (Figure 2). Cambria proposes advancing four borings (SB-1 through SB-4) in the vicinity of the dispensers, three (SB-5 through SB-7) in the vicinity of the UST complex, and one (SB-8) at a location in the assumed downgradient direction from both. Based on topography and the location of Lake Merritt and the Oakland Inner Harbor, it is anticipated that groundwater flows in a westerly to southwesterly direction toward the former Park Boulevard Creek. Park Boulevard Creek is now routed into storm drains, but it previously ran from approximately Interstate 580 to Lake Merritt, as shown on the Creek and Watershed Map of Oakland and Berkeley published by

the Oakland Museum of California (Figure 1). In addition, Cambria proposes installing monitoring wells at locations SB-4, SB-7, and SB-8.

Upon ACHCSA approval of this work plan, Cambria will complete the following tasks:

Permits: Cambria will obtain required permits for boring advancement.

Site Safety Plan: Cambria will prepare a comprehensive site safety plan to protect site workers. The plan will be kept on site during field activities and signed by each site worker.

Utility Clearance: Cambria will mark proposed drilling locations, and the locations will be cleared through Underground Service Alert prior to drilling. Additionally, a private utility locator will be used to identify subsurface obstacles to drilling.

Soil Borings: Cambria proposes to advance eight borings (SB-1 through SB-8) to investigate the vertical and lateral extent of petroleum hydrocarbons in soil and groundwater beneath the site. Assuming the absence of overhead and subsurface obstructions, Cambria will advance borings at the approximate locations shown on Figure 2.

At locations SB-1, SB-4, and SB-7, Cambria proposes to advance soil borings to approximately 25 fbg using direct-push technology. Borings will be logged continuously to provide detailed lithologic profiles. Soil samples will be collected for laboratory analysis every 5 feet above the water table. If saturated sediments are identified, a second boring will be advanced adjacent to each initial boring and a "dual tube" sampling system will be used to collect discrete grab groundwater samples, where sufficient groundwater is available, at 5-foot intervals from first-encountered groundwater to approximately 25 fbg.

At location SB-8, Cambria proposes to advance an initial soil boring to approximately 40 fbg using direct-push technology. The borings will be logged continuously to provide detailed lithologic profiles. Soil samples will be collected for laboratory analysis every 5 feet above the water table. If saturated sediments are identified, a second boring will be advanced adjacent to the initial boring and a "dual tube" sampling system will be used to collect discrete grab groundwater samples, where sufficient groundwater is available, at 5-foot intervals from first-encountered groundwater to approximately 40 fbg.

At locations SB-2, SB-3, and SB-6, Cambria proposes to advance soil borings to first-encountered groundwater. Borings will be logged and soil samples will be collected for laboratory analysis every 5 feet above the water table.

Upon sampling completion, all borings except SB-2, SB-4, SB-7, and SB-8 will be grouted from the bottom to the surface with neat Portland cement and surfaced to match the existing grade.

Soil and groundwater samples will be transported to a State-of-California-approved analytical laboratory for chemical analysis. Cambria's standard field procedures for soil borings are presented as Attachment B.

Under the supervision of a California registered geologist or civil engineer, a Cambria geologist will oversee the borings. Between groundwater sampling events, the drill rods and the stainless steel bailer used to collect groundwater samples will be decontaminated to prevent cross contamination from one zone to another. Soil samples for laboratory analysis will be retained in the Geoprobe® liner and will be covered on both ends with Teflon sheets and plastic end caps. Groundwater samples will be collected with disposable bailers and transferred into vials containing hydrochloric acid preservative with no head space. Soil and groundwater samples will be labeled, entered onto a chain-of-custody record, and placed into a cooler with ice for transport to a State-certified laboratory for analysis.

Monitoring Well Installations: If saturated sediments are identified, borings SB-2, SB-4, SB-7, and SB-8 will be over-drilled using a hollow-stem-auger drill rig to allow for monitoring well installation. Well depths and screen lengths will be based on static groundwater depth at the time of drilling. At locations SB-2, SB-4 and SB-7, wells will be screened from approximately 5 feet above the depth of static groundwater at the time of drilling to 5 feet below this depth. In order to monitor the condition of groundwater at a greater depth, the well screen at SB-8 will be installed deeper than those at SB-2, SB-4 and SB-7. The well design will be based on the lithologic information collected in the field. Cambria's standard field procedures for monitoring well installation are presented as Attachment C.

Chemical Analyses: A State-approved analytical laboratory will analyze soil and groundwater samples for total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, xylenes, methyl tertiary butyl ether, tert-butyl alcohol, di-isopropyl ether, ethyl tert butyl ether, tert amyl methyl ether, 1,2-dichloroethane , and 1,2-dibromomethane using EPA Method 8260.

Report Preparation: Within 60 days following the receipt of analytical results from the laboratory, Cambria will prepare a written report which will include field procedures, laboratory results, boring logs, conclusions and recommendations.

SCHEDULE

Upon receiving written work plan approval, Cambria will acquire permits and schedule field activities. An investigation report will be submitted approximately 60 days after completing the field activities.

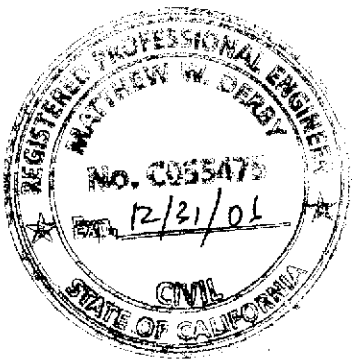
CLOSING

If you have any questions regarding the scope of work outlined in this work plan, please call David Gibbs at (510) 420-3363.

Sincerely,
Cambria Environmental Technology, Inc.

David M. Gibbs, P.G.
Project Geologist

Matthew W. Derby, P.E.
Senior Project Engineer



Figures: 1 - Site Vicinity /Well Survey Map
2 - Proposed Soil Boring Location Map

Table: 1 - Soil Analytical Results

Attachments: A - Historical Report
B - Standard Field Procedures for Geoprobe® Soil and Groundwater Sampling
C - Standard Field Procedures for Installing Monitoring Wells

cc: Denis Brown, Shell Oil Products US, 20945 S. Wilmington Ave., Carson, CA 90810

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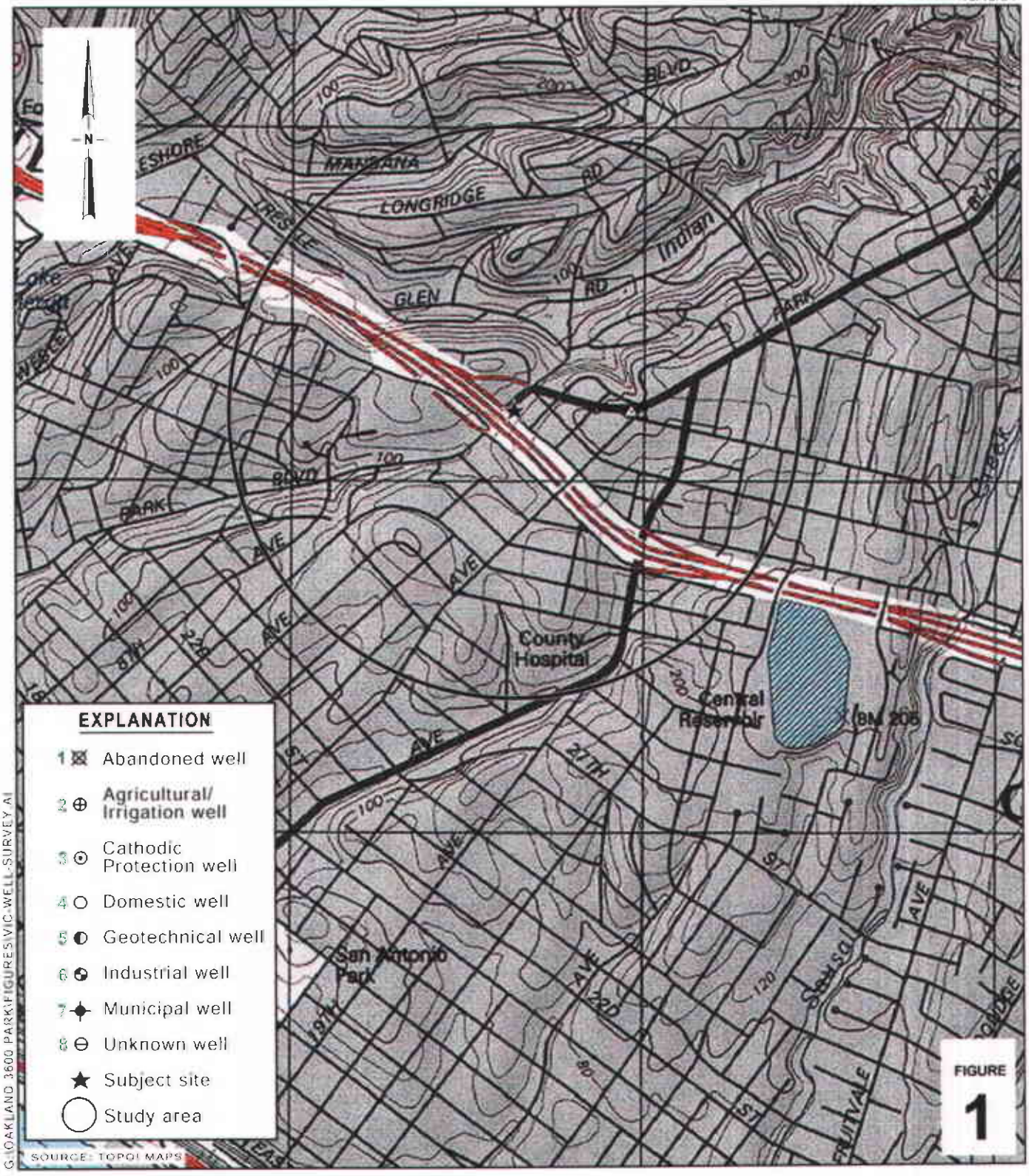
10/15/04



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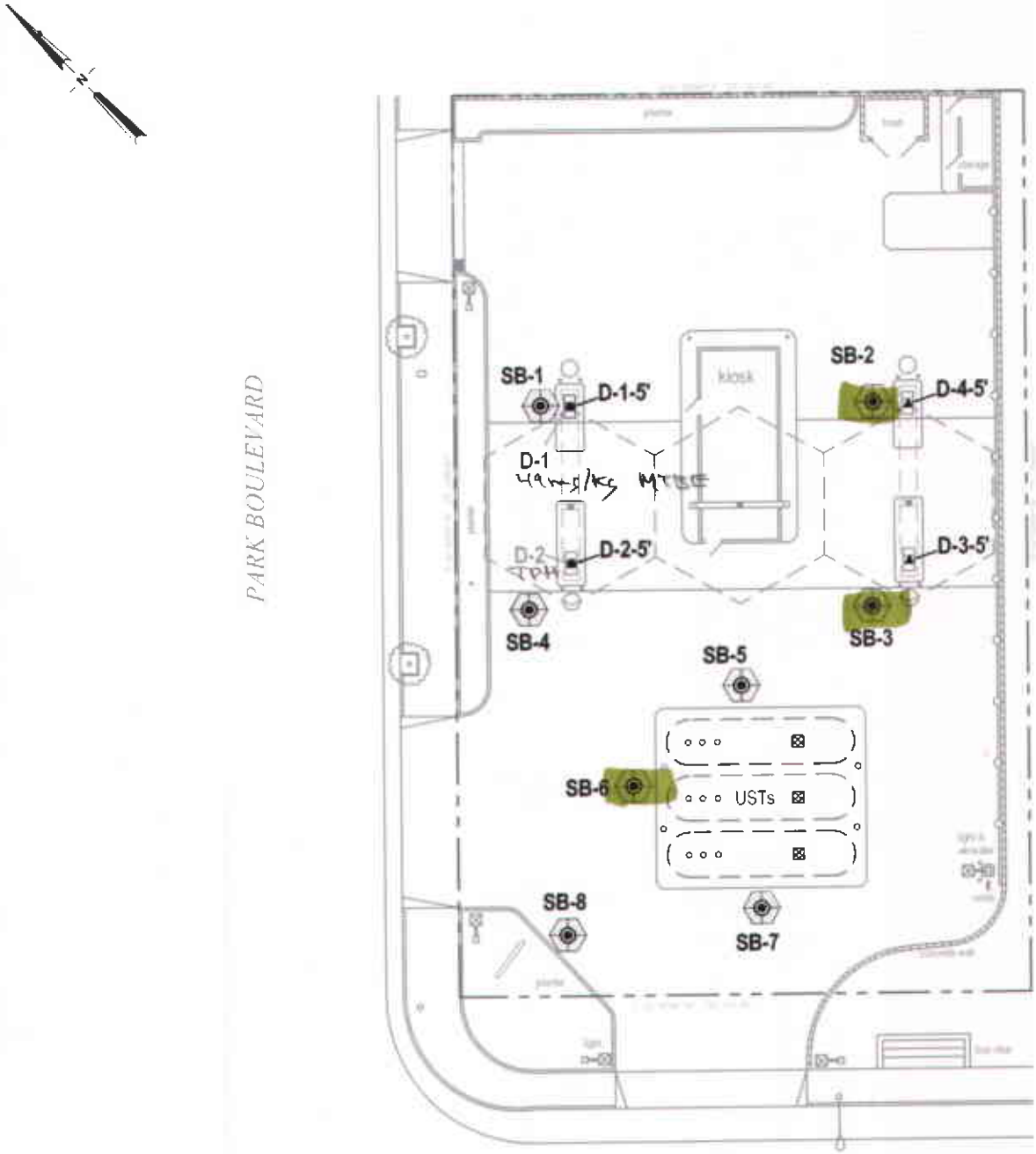
0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Shell-branded Service Station
3600 Park Boulevard
Oakland, California
Incident #98995747

CAMBRIA

Site Vicinity/Well Survey Map
(1/2-Mile Radius)



EXPLANATION

- SB-1 ⬡ Proposed soil boring location
- D-1-5' ▲ Dispenser soil sample location (8/20/04)
- D-1 ● Dispenser soil sample location (02/20/98)

0 15 30

Scale (ft)

FIGURE

2

Shell-branded Service Station
3600 Park Boulevard
Oakland, California
Incident No.98995747

CAMBRIA

Proposed Soil Boring Location Map

O:\OAKLAND 3600 PARK\FIGURES\SITE PLAN 8-05.DWG

Table 1. Soil Analytical Results - Shell-branded Service Station, 3600 Park Blvd., Oakland, California SAP # 135689

Sample	Depth (fbg)	Date Sampled	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl benzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)
D-1	2.0	2/20/1998	**930**	**1.0**	**20**	**11**	**78**	**49**
D-2	2.0	2/20/1998	**2,703**	**1.2**	**1.1**	**1.9**	**14**	**4.5**
D-2	5.0	2/20/1998	**180**	**1.3**	**0.46**	**1.7**	**4.0**	**1.6**
D-1-5'	5.0	8/20/2004	**180**	<0.50	<0.50	<0.50	**2.3**	<0.50
D-2-5'	5.0	8/20/2004	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
D-3-5'	5.0	8/20/2004	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
D-4-5'	5.0	8/20/2004	**30**	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

Abbreviations and Notes:

fbg = Feet below grade

mg/kg = Milligrams per kilogram (parts per million)

TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA Method 88260b; prior to 2004, analyzed by EPA Mehtod 8015

Benzene, toluene, ethylbenzene, and xylenes analyzed by EPA Method 8260B; prior to 2004, analyzed by EPA Method 8020

MTBE = methyl tertiary butyl ether analyzed by EPA Method 8260B; prior to 2004, analyzed by EPA Method 8020

<x = Not detected at detection limit x

G:\Oakland 3600 Park\2005 Subsurface Investigation\[3600 Park Blvd Lab Results.xls]Sheet1

ATTACHMENT A

Historical Report

Site: 204-5508-5108
Proj. ☐ Rem. ☐ Rpt. ☑ Bill ☐
1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐

CAMBRIA

FILE COPY

April 7, 1998

Leroy Griffin
City of Oakland
Fire Department
505 14th Street, Suite 702
Oakland, California 94612

Re: **Dispenser Soil Sampling Report**
Shell Service Station
3600 Park Boulevard
Oakland, California
WIC #204-5508-5108
Cambria Project #240-0937-984

Dear Mr. Griffin:

On behalf of Shell Oil Products Company (Shell), Cambria Environmental Technology, Inc. (Cambria) is submitting the results of sampling conducted during station upgrade activities at the site referenced above. Presented below are summaries of the site conditions, dispenser sampling activities, and conclusions.

SITE CONDITIONS

The site is located at the intersection of Park Boulevard and Chatham Road in Oakland, California. The area surrounding the site is both commercial and residential. Highway 580 runs near the southwestern boundary of the site.

This Shell service station was recently upgraded by Paradiso Mechanical of San Leandro, California (Paradiso). Paradiso added secondary containment to the existing dispensers and the turbine sumps (Figure 1).

CAMBRIA
ENVIRONMENTAL
TECHNOLOGY, INC.
1144 65TH STREET,
SUITE B
OAKLAND,
CA 94608
PH: (510) 420-0700
FAX: (510) 420-9170

SAMPLING ACTIVITIES AND SAMPLE ANALYSIS

Personnel Present	*Title*	*Company*
Darryk Ataide	Environmental Scientist	Cambria
Michael Paves	Staff Engineer	Cambria
Ron Hales	Site Foreman	Paradiso

Sample Date: February 18, 1998.

Sampling Requirements: Based on Cambria's February 3, 1998 telephone conversation with Leroy Griffin, the City of Oakland does not require sampling at dispensers during 1998 Upgrade projects unless there is evidence of hydrocarbons.

Dispenser Sampling: Cambria inspected the dispenser and tank pit areas. No field indications of hydrocarbons, such as staining or odor, were observed beneath dispensers D-3 or D-4 during the site visit (Figure 1). Therefore, no sampling was required for these dispensers. Cambria personnel observed staining and odor beneath dispensers D-1 and D-2. Soil samples were collected from beneath these dispensers at depths of approximately 2 feet into native soil. A second sample was collected from beneath dispenser D-2 at a depth of approximately 5 feet into native soil Cambria's standard procedures for dispenser and piping sampling are presented as Attachment A.

Sample Analyses: Sequoia Analytical of Redwood City, California (Sequoia) analyzed samples from beneath dispenser locations D-1 and D-2 for Total Petroleum Hydrocarbons as gasoline (TPHg) by modified EPA Method 8015, and benzene, toluene, ethylbenzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE) by EPA Method 8020.

ANALYTICAL RESULTS

The highest hydrocarbon concentrations in soil were 2,703 milligrams per kilogram (mg/kg) TPHg in sample D-2 at 2.0 feet. The highest benzene concentration was 1.3 mg/kg in sample D-2 at 5.0 feet. Analytical results are summarized in Table 1 and the laboratory report is included as Attachment B.

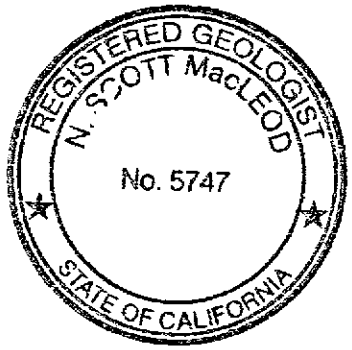
CONCLUSIONS

On March 5, 1998, Cambria filed an *Underground Storage Tank Unauthorized Release Site Report* in response to the hydrocarbons detected in sample D-1 and D-2 and reported in Sequoia's March 5, 1998 laboratory report. No field indications of hydrocarbons were detected beneath dispensers D-3 and D-4, which indicates that the hydrocarbons are limited to the area beneath dispensers D-1 and D-2.

CLOSING

We appreciate the opportunity to work with you on this project. Please call if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.



N. Scott MacLeod, R.G.
Principal Geologist

Attachments: A - Standard Piping and Dispenser Removal Sampling Procedures
B - Laboratory Analytic Reports for Soil

cc: Mr. Tim Hargraves, Shell Oil Products Company, P.O. Box 8080, Martinez, CA 94553
Mr. A.E. (Alex) Perez, Shell Oil Products Company, P.O. Box 8080, Martinez, CA 94553

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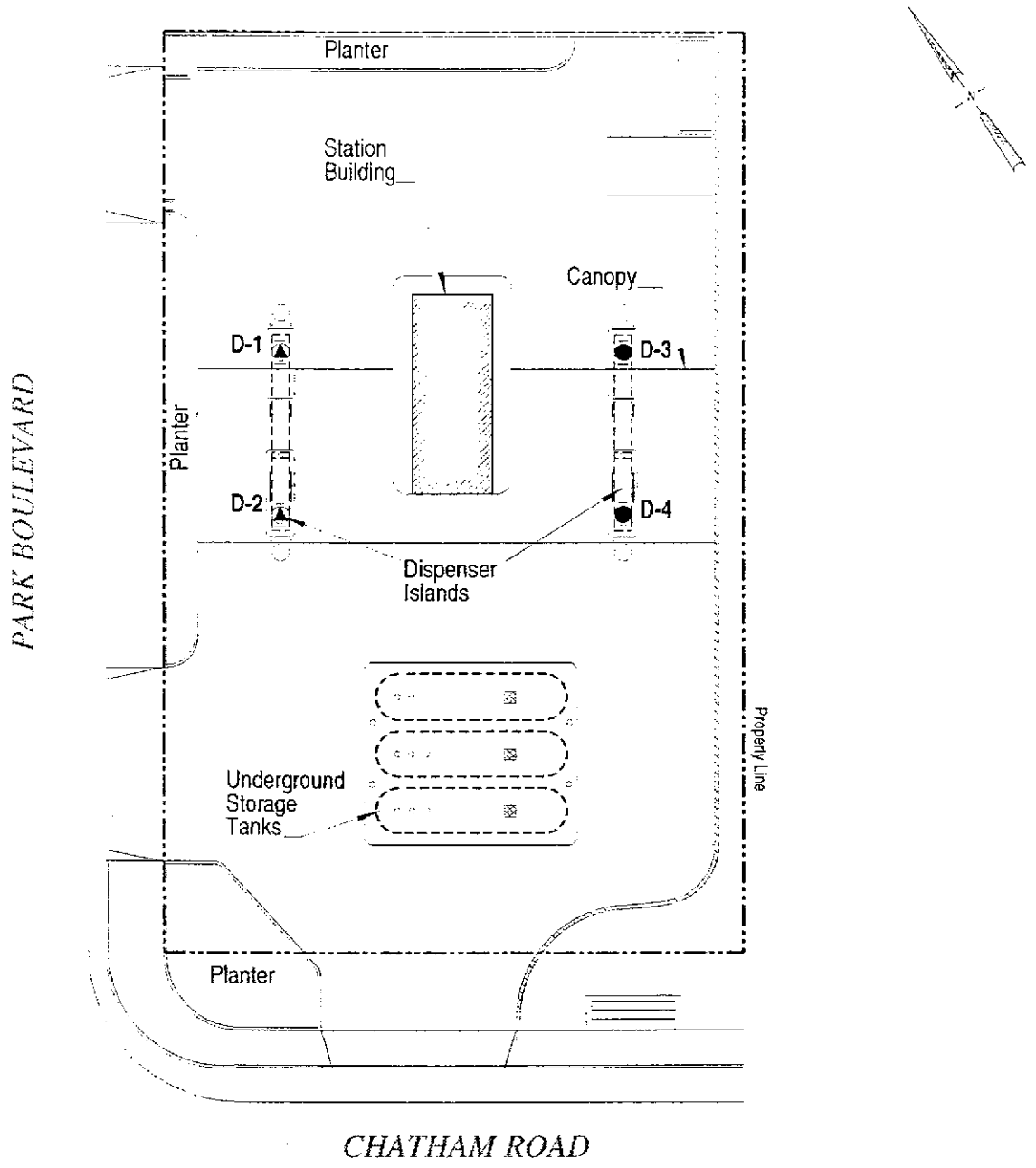

EXPLANATION

D-1 ▲ Dispenser Sample Location

D-3 ● Dispenser Location (not sampled)

0 15 30

Scale (ft)

CAMBRIA
Environmental Technology, Inc.

Shell Service Station
3600 Park Boulevard
Oakland, California

G:\OAK3600\FIGURES\DISP-SMPL.DWG

Dispenser Sample Locations Map

FIGURE 1

Table 1. Dispenser Sample Analytical Data - Shell Service Station - WIC #204-5508-5108, 3600 Park Boulevard, Oakland, California

Date	Sample ID	Depth (feet)	TPHg	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes
			(Concentrations reported in milligrams per kilogram)					
2/20/98	D-1	2.0	930	49	1.0	20	11	78
2/20/98	D-2	2.0	2,703	4.5	1.2	1.1	1.9	14
2/20/98	D-2	5.0	180	1.6	1.3	0.46	1.7	4.0

Abbreviations and Notes:

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

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

Benzene, ethylbenzene, toluene, and total xylenes by EPA Method 8020.

ATTACHMENT A

Standard Piping and Dispenser Removal
Sampling Procedures

STANDARD PIPING AND DISPENSER REMOVAL SAMPLING PROCEDURES

Cambria Environmental Technology, Inc. (Cambria) has developed standard operating procedures for collecting soil samples during petroleum dispenser and piping removal. These procedures ensure that the samples are collected, handled, and documented in compliance with California Administration Code Title 23: Waters; Chapter 3: Water Resources Control Board; Subchapter 16: Underground Storage Tank Regulations (Title 23). Cambria's sampling procedures are based on guidelines contained in the California State Regional Water Quality Control Board Tri-Regional Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites dated August 10, 1990.

Piping and Dispenser Removal Sampling

The objective of sample collection during routine dispenser and piping removals is to determine whether hydrocarbons or other stored chemicals have leaked to the subsurface. We collect one soil sample from the native soil beneath each dispenser unit, at each piping elbow, and at every 20 ft of product piping, as applicable.

The soil samples are collected in steam cleaned brass or steel tubes from either a driven split-spoon type sampler or the bucket of a backhoe. When a backhoe is used, approximately three inches of soil are scraped from the surface and the tube is driven into the exposed soil.

Upon removal from the split-spoon sampler or the backhoe, the samples are trimmed flush, capped with Teflon sheets and plastic end caps, labeled, logged and refrigerated for delivery under chain of custody to a State certified analytic laboratory.

ATTACHMENT B

Laboratory Analytic Reports for Soil

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

ambria
144 65th St. Suite C
akland, CA 94608
ttention: Mike Paves

roject: Shell 3600 Park, Oakland

Enclosed are the results from samples received at Sequoia Analytical on February 20, 1998.
he requested analyses are listed below:

AMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
302E40 -01	SOLID, D-1 (2')	02/18/98	Purgeable TPH/BTEX/MTBE
302E40 -02	SOLID, D-2 (2')	02/18/98	Purgeable TPH/BTEX/MTBE
302E40 -03	SOLID, D-2 (5')	02/18/98	Purgeable TPH/BTEX/MTBE

ease contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on
s project.

ry truly yours,

EQUOIA ANALYTICAL

oject Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: Shell 3600 Park, Oakland	Sampled: 02/18/98
1144 65th St. Suite C	Sample Descript: D-1 (2')	Received: 02/20/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 02/26/98
	Analysis Method: 8015Mod/8020	Analyzed: 03/02/98
Attention: Mike Paves	Lab Number: 9802E40-01	Reported: 03/05/98

C Batch Number: GC022698BTEXEXB
ıstrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	**100**	**930**
Methyl t-Butyl Ether	**2.5**	**49**
Benzene	**0.50**	**1.0**
Toluene	**0.50**	**20**
Ethyl Benzene	**0.50**	**11**
Xylenes (Total)	**0.50**	**78**
Chromatogram Pattern:		**C6-C12**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	137 Q
4-Bromofluorobenzene	60	140	Q

ıalytes reported as N.D. were not present above the stated limit of detection.

EQUOIA ANALYTICAL - ELAP #1210

ichard Herling
roject Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria
1144 65th St. Suite C
Oakland, CA 94608

Attention: Mike Paves

Client Proj. ID: Shell 3600 Park, Oakland
Sample Descript: D-2 (2')
Matrix: SOLID
Analysis Method: 8015Mod/8020
Lab Number: 9802E40-02

Sampled: 02/18/98
Received: 02/20/98
Extracted: 02/26/98
Analyzed: 03/03/98
Reported: 03/05/98

QC Batch Number: GC022698BTEXEXB
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	25	2703
Methyl t-Butyl Ether	0.62	4.5
Benzene	0.12	1.2
Toluene	0.12	1.1
Ethyl Benzene	0.12	1.9
Xylenes (Total)	0.12	14
Chromatogram Pattern:		C6-C12

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	153 Q
4-Bromofluorobenzene	60	140	2 Q

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Richard Herling
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria	Client Proj. ID: Shell 3600 Park, Oakland	Sampled: 02/18/98
1144 65th St. Suite C	Sample Descript: D-2 (5')	Received: 02/20/98
Oakland, CA 94608	Matrix: SOLID	Extracted: 02/26/98
	Analysis Method: 8015Mod/8020	Analyzed: 03/03/98
Attention: Mike Paves	Lab Number: 9802E40-03	Reported: 03/05/98

C Batch Number: GC022698BTEXEXB
ıstrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	**25**	**180**
Methyl t-Butyl Ether	**0.62**	**1.6**
Benzene	**0.12**	**1.3**
Toluene	**0.12**	**0.46**
Ethyl Benzene	**0.12**	**1.7**
Xylenes (Total)	**0.12**	**4.0**
Chromatogram Pattern:		**C6-C12**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	158 Q
4-Bromofluorobenzene	60	140	1 Q

ıalytes reported as N.D. were not present above the stated limit of detection.

EQUOIA ANALYTICAL - ELAP #1210

ichard Herling
roject Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria Environmental Tech.
1144 65th St., Ste. C
Oakland, CA 94608
Attention: Mike Paves

Client Project ID: Shell 3600 Park, Oakland
Matrix: Solid
Work Order #: 9802E40 01-03
Reported: Mar 6, 1998

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes	Gas
QC Batch#:	GC022698BTEXEXB	GC022698BTEXEXB	GC022698BTEXEXB	GC022698BTEXEXB	GC022698BTEXEXB
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015M
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Minkel	J. Minkel	J. Minkel	J. Minkel	J. Minkel
MS/MSD #:	9802H5401	9802H5401	9802H5401	9802H5401	9802H5401
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Prepared Date:	2/26/98	2/26/98	2/26/98	2/26/98	2/26/98
Analyzed Date:	2/27/98	2/27/98	2/27/98	2/27/98	2/27/98
Instrument I.D.#:	GCHP22	GCHP22	GCHP22	GCHP22	GCHP22
Conc. Spiked:	0.20 mg/Kg	0.20 mg/Kg	0.20 mg/Kg	0.60 mg/Kg	1.2 mg/Kg
Result:	0.20	0.20	0.20	0.60	1.2
MS % Recovery:	100	100	100	100	100
Dup. Result:	0.20	0.20	0.20	0.60	1.2
MSD % Recov.:	100	100	100	100	100
RPD:	0.0	0.0	0.0	0.0	0.0
RPD Limit:	0-25	0-25	0-25	0-25	0-25
LCS #:	BLK022698	BLK022698	BLK022698	BLK022698	BLK022698
Prepared Date:	2/26/98	2/26/98	2/26/98	2/26/98	2/26/98
Analyzed Date:	2/27/98	2/27/98	2/27/98	2/27/98	2/27/98
Instrument I.D.#:	GCHP22	GCHP22	GCHP22	GCHP22	GCHP22
Conc. Spiked:	0.20 mg/Kg	0.20 mg/Kg	0.20 mg/Kg	0.60 mg/Kg	1.2 mg/Kg
LCS Result:	0.20	0.20	0.20	0.60	1.2
LCS % Recov.:	100	100	100	100	100
MS/MSD Control Limits	60-140	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD

Serial No: 9862E40

Page 1 of 1

Site Address: 3600 PARK, OAKLAND

WIC#: 204-5508-3400

Shell Engineer: TIM HARGRAVES

Phone No.: 335-5031
Fax #: 335-5016

Consultant Name & Address: CAMBRIA ENVIRONMENTAL
1144 65th St. Suite C, Oakland, CA 94608

Consultant Contact: MIKE PAVES

Phone No.: 510 420-0700
Fax #: 420-9170

Comments:

Sampled by: MIKE PAVES

Printed Name: MIKE PAVES

LAB: SEQUOIA

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020 (MTBE)	Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
01 D-1 (2')	2/18/98		X			1			X	ND		X						
02 D-2 (2')	2/18/98		X			1			X			X						
03 D-2 (5')	2/18/98		X			1			X			X						

CHECK ONE (1) BOX ONLY — C1/D1

G.W. Monitoring	☐	4461
Site Investigation	☐	4441
Soil Classify/Disposal	☐	4442
Water Classify/Disposal	☐	4443
Soil/Air Remt. or Sys. O & M	☐	4452
Water Remt. or Sys. O & M	☐	4453
Other	☒	

TURN AROUND TIME

- 24 hours ☐
- 48 hours ☐
- 10 days ☒ (Normal)
- Other ☐

NOTE: Notify Lab as soon as Possible of 24/48 hr. TAT.

UST AGENCY: ALAMEDA 20 3 41

Relinquished By (signature):	Printed Name:	Date: 2/19	Received (signature):	Printed Name:	Date: 2/20/98
	MIKE PAVES	Time: 2/18/98			Time: 10:30
Relinquished By (signature):	Printed Name:	Date: 2/20/98	Received (signature):	Printed Name:	Date:
	RAY SCROGGIN	Time:			Time:
Relinquished By (signature):	Printed Name:	Date:	Received (signature):	Printed Name:	Date: 2/20/98
		Time:		MIKE YOUNG	Time: 15:41

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

GC1MAI

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Cambria
1144 65th St. Suite C
Oakland, CA 94608
Attention: Mike Paves

Client Proj. ID: Shell 3600 Park, Oakland
Lab Proj. ID: 9802E40

Received: 02/20/98
Reported: 03/05/98

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 7 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Richard Herling
Project Manager

ATTACHMENT B

Standard Field Procedures for Geoprobe® Soil and Groundwater Sampling

CAMBRIA

STANDARD FIELD PROCEDURES FOR GEOPROBE® SOIL AND GROUNDWATER SAMPLING

This document describes Cambria Environmental Technology's standard field methods for GeoProbe® soil and ground water sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e., sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or separate-phase hydrocarbon saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e., cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Sampling

GeoProbe® soil samples are collected from borings driven using hydraulic push technologies. A minimum of one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples can be collected near the water table and at lithologic changes. Samples are collected using samplers lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned or washed prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon® tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

After a soil sample has been collected, soil from the remaining tubing is placed inside a sealed plastic bag and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable GasTech® or photoionization detector measures volatile hydrocarbon vapor concentrations in the bag's headspace, extracting the vapor through a slit in the plastic bag. The measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Grab Ground Water Sampling

Ground water samples are collected from the open borehole using bailers, advancing disposable Tygon® tubing into the borehole and extracting ground water using a diaphragm pump, or using a hydro-punch style sampler with a bailer or tubing. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

Discrete Depth Soil and Ground Water Sampling

Soil and groundwater samples are collected for lithologic and chemical analysis using a direct driven, dual tube soil coring system. A hydraulic hammer drives sampling rods into he ground to collect continuous soil cores. Two nested sampling rods are driven at the same time: a larger diameter outer rod to act as a temporary drive casing and a smaller inner rod to retrieve soil cores. As the rods are advanced the soil is driven into a sample barrel that is attached to the end of the inner rod. The outer rod ensures that the sample is collected from the desired interval by preventing sloughing of the overlying material. After reaching the desired depth the inner rods are removed from the boring and the sleeves containing the soil sample are removed from the inner sample barrel. Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon® tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

When collecting groundwater samples, the sample barrel and inner rods are removed from the boring once the targeted water bearing zone has been reached. The drive casing is pulled up from 0.5 to 5 feet to allow groundwater to enter the borehole. Small diameter well casing and screen is then installed in the borehole to facilitate sample collection. The drive casing is then pulled up sufficiently to expose the desired length of screen and samples are collected using a bailer, peristaltic, bladder or inertial pump. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory quality assurance/quality control (QA/QC) blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe. If the dual tube system is used, the borings are filled to the ground surface with cement grout poured or pumped through the dual tube casing.

ATTACHMENT C

Standard Field Procedures for Installing Monitoring Wells

CAMBRIA

STANDARD FIELD PROCEDURES FOR INSTALLING MONITORING WELLS

This document describes Cambria Environmental Technology's standard field methods for drilling, installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Well Construction and Surveying

Groundwater monitoring wells are installed in soil borings to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security. The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.