CONESTOGA-ROVERS & ASSOCIATES

5900 Hollis Street, Suite A
Emeryville, California 94608
Telephone: (510) 420-0700 Fax: (510) 420-9170
www.CRAworld.com

TRANSMITTAL

DATE: July 14, 2011

REFERENCE NO.: 241501

PROJECT NAME: 461 8th Street, Oakland

TO: Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

RECEIVED
11:33 am, Jul 18, 2011
Alameda County
Environmental Health

Please find enclosed:
- ☐ Draft
- ☐ Originals
- ☐ Prints
- ☒ Final
- ☐ Other

Sent via:
- ☐ Mail
- ☐ Overnight Courier
- ☐ Same Day Courier
- ☒ Other GeoTracker and Alameda County FTP

QUANTITY	DESCRIPTION
1	Subsurface Investigation Work Plan

- ☐ As Requested
- ☐ For Your Use
- ☒ For Review and Comment
- ☐
- ☐

COMMENTS:
If you have any questions regarding the contents of the document, please call Peter Schaefer at (510) 420-3319.

Copy to: Denis Brown, Shell Oil Products US (electronic copy)
Leroy Griffin, Fire Prevention Bureau, 250 Frank Ogawa Plaza, 3rd Floor, Suite 3341, Oakland, CA 94612
A.F. Evans Company, c/o Anye Spivey, 1000 Broadway, Suite 300, Oakland, CA 94507
Leah Goldberg, Meyers Nave, 555 12th Street, Suite 1500, Oakland, CA 94607
Grover Buhr, Treadwell & Rollo (electronic copy)

Completed by: Peter Schaefer Signed: Peter Schaefer

Filing: **Correspondence File**

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

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

Re: Former Shell Service Station
461 8th Street
Oakland, California
SAP Code 129453
Incident No. 97093399
ACEH Case No. RO0000343

Dear Mr. Wickham:

The attached document is provided for your review and comment. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

As always, please feel free to contact me directly at (707) 865-0251 with any questions or concerns.

Sincerely,

Denis L. Brown
Senior Program Manager

SUBSURFACE INVESTIGATION WORK PLAN

FORMER SHELL SERVICE STATION
461 8TH STREET
OAKLAND, CALIFORNIA

SAP CODE	129453
INCIDENT NO.	97093399
AGENCY NO.	RO0000343

Prepared by:
Conestoga-Rovers & Associates

5900 Hollis Street, Suite A
Emeryville, California
U.S.A. 94608

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JULY 14, 2011
REF. NO. 241501 (26)
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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) prepared this work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) to assess potential for soil vapor intrusion in areas around the 2008 excavation area and other areas of known or suspected soil impacts as discussed during a February 17, 2011 meeting with Alameda County Environmental Health (ACEH) and as requested in ACEH's May 2, 2011 letter.

The site is a paved parking lot located at the southwest corner of the intersection of 8th Street and Broadway in a primarily commercial area of Oakland, California (Figure 1). The former station layout included an underground storage tank (UST) complex and dispenser islands (Figure 2). The site is currently a paid public parking lot.

Historical soil analytical data are presented in Table 1, and historical soil vapor data are presented in Table 2. A summary of previous work performed at the site and additional background information is contained in Appendix A.

2.0 WORK TASKS

CRA proposes to install seven nested soil vapor probes on site to assess the potential for soil vapor intrusion at the locations shown on Figure 2. Specific tasks are described below.

2.1 PERMIT

CRA will obtain a boring permit to install the soil vapor probes from the Alameda County Public Works Agency (ACPWA).

2.2 HEALTH AND SAFETY PLAN (HASP)

CRA will prepare a HASP to protect site workers. The plan will be kept on site during field activities and will be reviewed and signed by each site worker.

2.3 UTILITY CLEARANCE

CRA will mark the proposed probe locations, and the locations will be cleared by Underground Service Alert and a private utility locating service prior to drilling.

2.4 SOIL VAPOR PROBE INSTALLATION

CRA proposes to install seven nested soil vapor probes (VP-5 through VP-11) into the subsurface around the 2008 excavation area and other areas of known or suspected soil impacts (Figure 2).

Assuming the absence of subsurface obstructions, CRA will advance the soil borings to 10 feet below grade (fbg) using an air-knife or direct-push rig, depending on soil conditions. The nested soil vapor probes will be installed with two screen intervals (5 and 10 fbg) at each location to assess the vertical attenuation of soil vapors.

A CRA geologist will supervise the drilling and describe the encountered soils using the Unified Soil Classification System and Munsell Soil Color Charts. CRA will prepare a boring log for each soil vapor probe boring.

After the borings are advanced, fixed vapor-sampling points will be installed in each boring using ¼-inch diameter Teflon® tubing. Each point will use a ¾-inch screen interval attached to the Teflon® tubing. To ensure the tubing does not curl or kink during installation, CRA will first straighten out each length of tubing prior to installation and then use a small-diameter PVC guide pipe to hold the tubing in place within the boring while packing the annulus with sand. A clean, fine-grained silica sand filter pack will be installed approximately 3 inches below and above the deepest screened interval (10 fbg), and the guide pipe will be lifted as the sand pack is installed to ensure the pack stabilizes the tubing within each boring. The annulus will then be sealed to 3 inches below the 5 fbg sample point, with a bentonite slurry set atop a 2-inch base of bentonite pellets. The shallow sample point (5 fbg) will be installed in the same manner. The probe will be sealed to the surface using bentonite slurry, set atop a 2-inch base of bentonite pellets. Each soil vapor probe will be completed at the surface using a traffic-rated well box at grade.

CRA will perform this work under the supervision of a professional geologist or engineer.

2.5 SOIL VAPOR PROBE SAMPLING

At least 2 weeks following probe installation, CRA will collect soil vapor samples from each sampling point. Sampling is affected by rain. CRA's standard procedure is to allow 2 days or more after a heavy rain event prior to collecting soil vapor samples.

CRA will sample the new soil vapor probes using a vacuum pump and Tedlar® bags. Soil vapor samples will be collected from each screened interval in each probe. Prior to sampling, CRA will purge at least three tubing volumes of air from the probes using a vacuum pump. Then CRA will attach a sealed "lung sampler" containing a 1-liter Tedlar® bag to the probe and attach the vacuum pump to the box. The vacuum pump will lower the pressure in the "lung sampler" and draw air from the probe into the Tedlar® bag. To avoid breakage, CRA will fill the bags no more than two-thirds full. Each sample will be labeled, entered onto a chain-of-custody, and placed into a protective box at room temperature for transport to a State of California-certified laboratory for analysis within 72 hours.

2.6 LEAK TESTING

To check the system for leaks, CRA will cover the soil gas probe surface casing and sampling equipment with a containment unit (or shroud). Prior to soil gas probe purging, CRA will introduce helium into the containment unit to obtain a minimum 50 percent helium content level. CRA will confirm the helium content within the containment unit using a helium meter and will record the helium meter readings in our field notes. Helium will continue to be introduced to the containment unit during soil gas probe purging and sampling.

All samples will be analyzed in a laboratory for helium. In the event that the soil vapor samples contain a helium content of greater than 10 percent of the source concentration (i.e., 10 percent of the helium content measured within the containment unit), the soil gas sample will be considered invalid.

2.7 CHEMICAL ANALYSES

Vapor samples will be analyzed for total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, and total xylenes by EPA Method 8260B and for oxygen and argon, carbon dioxide, methane, and helium by ASTM D Method 1946 (M).

2.8 REPORT PREPARATION

Following receipt of the analytical results from the laboratory, CRA will prepare a written report, which will include field procedures, tabulated analytical data, boring logs, and analytical laboratory reports.

3.0 SCHEDULE

CRA will implement the soil vapor probe installations upon receiving ACEH's written approval of this work plan and the drilling permit from ACPWA.

All of Which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES

Peter Schaefer, CEG, CHG

Aubrey K. Cool, PG

FIGURES

11/10/08

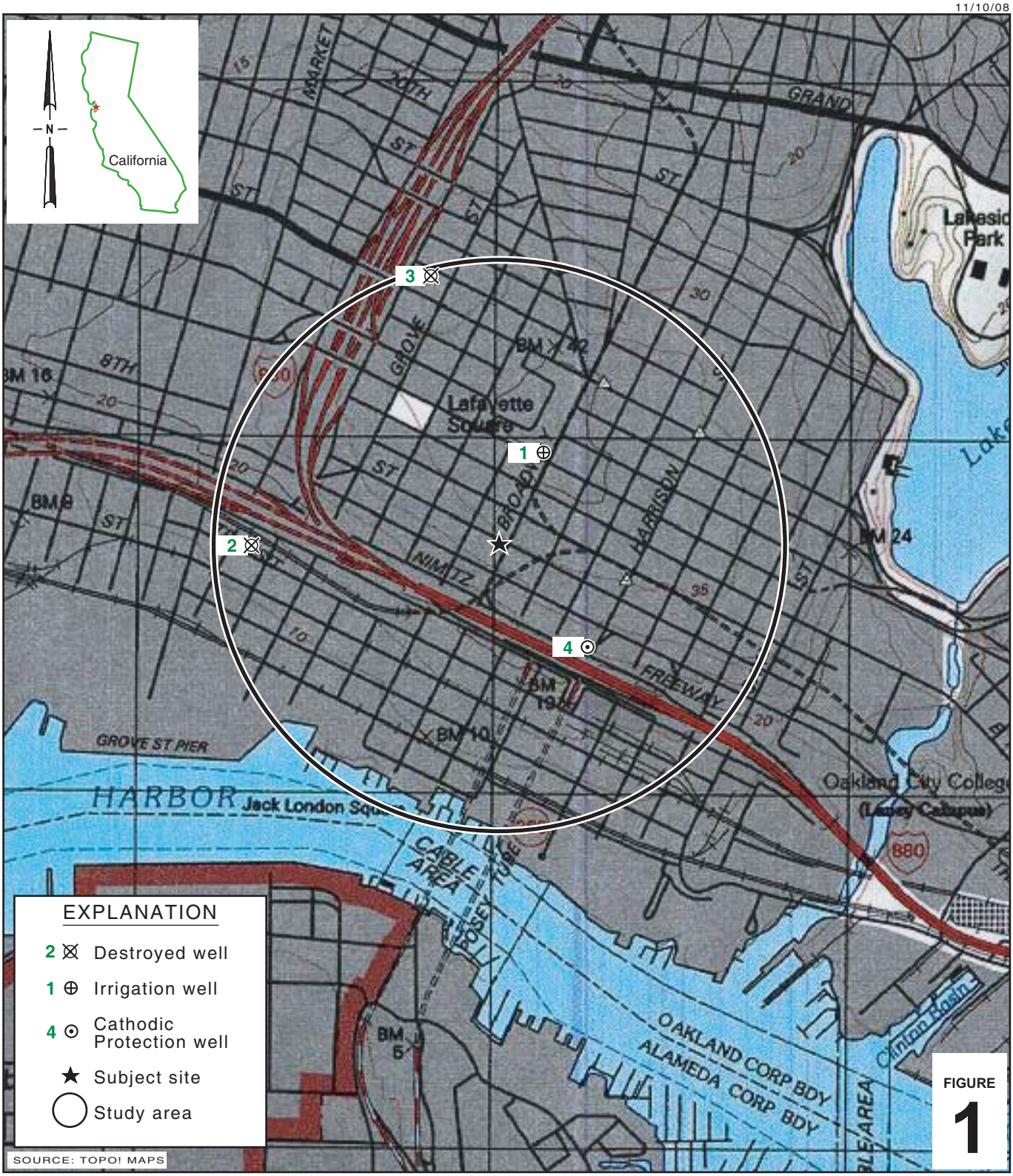

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FIGURE
1

0 1/8 1/4 1/2 1

SCALE (MILES)

Former Shell Service Station
461 8th Street
Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

07/13/2011

EXPLANATION

- VP-5 — Proposed soil vapor probe location
- B-28 — Soil boring location
- SVP-1 — Subslab soil vapor probe location
- S-4 — Monitoring well location
- S-21B — Deeper monitoring well location
- OW-1 — Observation well location
- IP-1 — Injection point
- B-25/ VP-2 — Soil boring/vapor probe location
- B-24/ VP-1 — Destroyed soil boring/ vapor probe location
- S-1 — Destroyed well location
- B-1 — Soil boring location
- TR-V1 — Soil vapor boring location

8TH STREET

BROADWAY

Former USTs

Former Dispenser Islands

Former Fuel Lines

Excavation Area

Former Shell Station
461 8th St.

S-1, S-10, VP-10, B-3, TR-V4, B-17, B-16, B-4, B-18, VP-8, TR-V3, B-15, B-6, TR-2, B-19, B-14, B-2, B-8, S-8, B-5, VP-11, TR-V1, B-20, S-23, VP-5, S-16, B-13, B-24/ VP-1, TR-4, VP-7, B-7, IP-1, S-15, IP-2, B-12, S-21A, B-28, B-10, AS-1, S-21B, IP-3, S-14, TR-1, S-12, OW-1, S-17, B-1, S-22A, B-23, S-14R, B-21, B-27/ VP-4, VP-9, TR-V2, B-11, VP-6, B-29, S-22B, S-19, S-18, S-13, B-26/ VP-3, TR-3, SVP-2, B-22, B-9, S-20, B-25/ VP-2, S-9, SVP-1

N

0 10 20 40

Scale (ft)

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Site Plan

CONESTOGA-ROVERS & ASSOCIATES

Former Shell Service Station

461 8th Street
Oakland, California

FIGURE

2

TABLES

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
B1-5.0	7/6/1994	5	28 a	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B1-10.0	7/6/1994	10	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B2-5.0	7/6/1994	5	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B2-15.0	7/6/1994	15	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B2-20.0	7/6/1994	20	<2	<1	<0.0025	0.0028	<0.0025	0.003	---	---	---	---	---	---	---
B3-10.0	7/6/1994	10	50 a	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B3-15.0	7/6/1994	15	4.1	<1	<0.0025	<0.0025	<0.0025	0.025	---	---	---	---	---	---	---
B4-5.0	7/6/1994	5	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B4-10.0	7/6/1994	10	13 b	15	<0.0025	0.037	0.027	0.21	---	---	---	---	---	---	---
B5-5.0	7/7/1994	5	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B5-9.75	7/7/1994	9.75	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B6-5.0	7/7/1994	5	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B6-18.5	7/7/1994	18.5	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B7-5.0	7/7/1994	5	31 a	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B7-10.0	7/7/1994	10	**410 b**	14	0.24	0.89	0.31	2.0	---	---	---	---	---	---	---
B8-5.0	7/7/1994	5	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B8-9.0	7/7/1994	9	<4	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
B9-5.0	7/7/1994	5	<1	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---

TABLE 1

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Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
B9-14.5	7/7/1994	14.5	<2	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-8-6.5	12/7/1994	6.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-8-11.5	12/7/1994	11.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-8-21.5	12/7/1994	21.5	---	<1	0.014	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-9-6.5	12/7/1994	6.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-9-11.5	12/7/1994	11.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-9-21.5	12/7/1994	21.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-10-6.5	12/7/1994	6.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-10-11.5	12/7/1994	11.5	---	**760**	0.0032	0.028	**6.4**	6.9	---	---	---	---	---	---	---
S-10-16.5	12/7/1994	16.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
S-10-21.5	12/7/1994	21.5	---	<1	<0.0025	<0.0025	<0.0025	<0.0025	---	---	---	---	---	---	---
HA-1-10.0	10/14/2003	10.0	---	< 1.0 d	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---
HA-1-16.5	10/14/2003	16.5	---	< 1.0 d	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---
TR-1-0.5	5/20/2005	0.5	---	<0.98	---	---	---	---	---	---	---	---	---	---	---
TR-1-5.0	5/20/2005	5	---	<1.1	---	---	---	---	---	---	---	---	---	---	---
TR-1-8.0	5/20/2005	8	---	<1.1	---	---	---	---	---	---	---	---	---	---	---
TR-2-0.5	5/20/2005	0.5	---	<1.0	---	---	---	---	---	---	---	---	---	---	---
TR-2-5.0	5/20/2005	5	---	<0.97	---	---	---	---	---	---	---	---	---	---	---
TR-2-8.0	5/20/2005	8	---	<1.1	---	---	---	---	---	---	---	---	---	---	---
TR-3-0.5	5/20/2005	0.5	---	<0.93	---	---	---	---	---	---	---	---	---	---	---
TR-3-5.0	5/20/2005	5	---	<1.0	---	---	---	---	---	---	---	---	---	---	---
TR-4-0.5	5/20/2005	0.5	---	<1.0	---	---	---	---	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
TR-4-5.0	5/20/2005	5	---	<1.0	---	---	---	---	---	---	---	---	---	---	---
B-10-5	12/13/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-10-10	12/13/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-10-15	12/13/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-10-20	12/13/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-10-25	12/13/2006	25	---	**7,800**	**49**	**290**	**160**	**800**	<0.50	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50
B-11-5	12/13/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-11-10	12/13/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-11-15	12/13/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-11-20	12/13/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-11-25	12/13/2006	25	---	**3,500**	**30**	**200**	**97**	**510**	<0.50	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50
B-12-5	12/11/2006	5	---	<1.0	0.028	0.018	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-12-10	12/11/2006	10	---	**2,300**	**0.54**	7.5	<0.50	**180**	<0.50	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50
B-12-15	12/11/2006	15	---	**1,700**	**2.9**	**35**	**22**	**190**	<0.50	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50
B-12-20	12/11/2006	20	---	**5,900**	**30**	**250**	**100**	**570**	<0.50	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50
B-12-25	12/11/2006	25	---	**750**	0.70	8.3	**13**	**73**	<0.12	<1.2	<0.50	<0.50	<0.50	<0.12	<0.12
B-13-5	12/11/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-13-10	12/11/2006	10	---	<1.0	0.022	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-13-15	12/11/2006	15	---	<1.0	0.028	<0.0050	<0.0050	<0.010	<0.0050	0.053	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-13-20	12/11/2006	20	---	4.5	0.12	0.18	0.070	0.54	<0.0050	0.083	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-13-25	12/11/2006	25	---	**1,400**	1.2	**19**	**17**	**97**	<0.12	<1.2	<0.50	<0.50	<0.50	<0.12	<0.12
B-14-5	12/11/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-14-10	12/11/2006	10	---	<2.0	<0.010	<0.010	<0.010	<0.020	<0.010	<0.10	<0.020	<0.010	<0.010	<0.010	<0.010
B-14-15	12/11/2006	15	---	<1.0	0.039	<0.0050	<0.0050	<0.010	<0.0050	0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-14-20	12/11/2006	20	---	<2.0	0.019	<0.010	<0.010	<0.020	<0.010	<0.10	<0.020	<0.010	<0.010	<0.010	<0.010

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
B-14-25	12/11/2006	25	---	<2.0	0.017	<0.010	0.016	0.023	<0.010	<0.10	<0.020	<0.010	<0.010	<0.010	<0.010
B-15-5	12/12/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-15-10	12/12/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-15-15	12/12/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-15-20	12/12/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-15-25	12/12/2006	25	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-16-5	12/12/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-16-10	12/12/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-16-15	12/12/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-16-20	12/12/2006	20	---	1.6	0.054	0.11	0.043	0.26	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-16-25	12/12/2006	25	---	2.5	0.19	0.17	0.12	0.54	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-17-5	12/12/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-17-10	12/12/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-17-15	12/12/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-17-20	12/12/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-17-25	12/12/2006	25	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-18-5	12/12/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-18-10	12/12/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-18-15	12/12/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-18-20	12/12/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-18-25	12/12/2006	25	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-19-5	12/12/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-19-10	12/12/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-19-15	12/12/2006	15	---	<1.0	0.028	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-19-20	12/12/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
B-19-25	12/12/2006	25	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-20-5	12/11/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-20-10	12/11/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-20-15	12/11/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-20-20	12/11/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-20-25	12/11/2006	25	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-21-5	12/11/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-21-10	12/11/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-21-15	12/11/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-21-20	12/11/2006	20	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-21-24	12/11/2006	24	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-21-28	12/11/2006	28	---	<1.0	<0.0050	0.0087	0.011	0.060	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-22-5	12/13/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-22-10	12/13/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-22-15	12/13/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-22-20	12/13/2006	20	---	**1,800**	0.81	**10**	**26**	**180**	<0.50	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50
B-22-25	12/13/2006	25	---	**3,000**	**14**	**140**	**85**	**470**	<0.50	<5.0	<2.0	<2.0	<2.0	<0.50	<0.50
B-23-5	12/12/2006	5	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-23-10	12/12/2006	10	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-23-15	12/12/2006	15	---	<1.0	<0.0050	<0.0050	<0.0050	<0.010	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-23-20	12/12/2006	20	---	1.7	<0.0050	0.0053	0.010	0.075	<0.0050	<0.050	<0.010	<0.0050	<0.0050	<0.0050	<0.0050
B-23-25	12/12/2006	25	---	**4,900**	**7.0**	**78**	**60**	**450**	<0.25	<2.5	<1.0	<1.0	<1.0	<0.25	<0.25
B-24-5	11/30/2007	5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
B-24-11.5	11/30/2007	11.5	---	0.51	0.043	0.021	0.0094	0.116	---	---	---	---	---	---	---
B-24-15	11/30/2007	15	---	<0.50	0.020	0.0064	<0.0050	0.0140	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
B-24-20	11/30/2007	20	---	1.3	0.036	0.049	0.016	0.102	---	---	---	---	---	---	---
B-24-25	11/30/2007	25	---	12	<0.0050	0.039	0.040	0.308	---	---	---	---	---	---	---
B-24-30	11/30/2007	30	---	**3,000**	**2.2**	**23**	**26**	**140**	---	---	---	---	---	---	---
B-24-32	11/30/2007	32	---	**220**	<0.12	0.73	1.3	6.14	---	---	---	---	---	---	---
B-25-5	12/3/2007	5	---	0.76 e	<0.0050	0.31	0.011	0.070	---	---	---	---	---	---	---
B-25-10	12/3/2007	10	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
B-26-5	11/30/2007	5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
B-26-10	11/30/2007	10	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
B-26-15	11/30/2007	15		<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
B-27-5	12/3/2007	5	---	<0.50	<0.0050	0.015	<0.0050	<0.0100	---	---	---	---	---	---	---
B-27-10	12/3/2007	10	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-12-5.5	12/13/2007	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-12-9.5	12/13/2007	9.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-12-14.5	12/13/2007	14.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-12-19.5	12/13/2007	19.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-12-24.5	12/13/2007	24.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-12-29.5	12/13/2007	29.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-12-34.5	12/13/2007	34.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-13-5.5	12/12/2007	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-13-10	12/12/2007	10	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-13-15	12/12/2007	15	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-13-20.5	12/12/2007	20.5	---	**340**	<0.0050	0.48	1.1	8.7	---	---	---	---	---	---	---
S-13-25	12/12/2007	25	---	62	0.017	0.053	0.030	0.146	---	---	---	---	---	---	---
S-13-31	12/12/2007	31	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-13-35	12/12/2007	35	---	1.2	<0.0050	0.0069	<0.0050	0.0077	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
S-14-5	12/12/2007	5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-14-10	12/12/2007	10	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-14-15.5	12/12/2007	15.5	---	<0.50	0.014	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-14-20	12/12/2007	20	---	**3,100**	**6.7**	**42**	**66**	**308**	---	---	---	---	---	---	---
S-14-25.5	12/12/2007	25.5	---	2.9	0.0050	0.0074	0.037	0.091	---	---	---	---	---	---	---
S-14-30	12/12/2007	30	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-14-35	12/12/2007	35	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-15-4.5*	12/11/2007	4.5	---	6.5	<0.0050	0.0058	<0.0050	0.044	---	---	---	---	---	---	---
S-15-9.5	12/11/2007	9.5	---	**5,000**	**93**	**350**	**100**	**660**	---	---	---	---	---	---	---
S-15-14.5	12/11/2007	14.5	---	**1,900**	**34**	**290**	**72**	**460**	---	---	---	---	---	---	---
S-15-19.5	12/11/2007	19.5	---	**220**	**4.0**	**19**	**5.8**	**33.8**	---	---	---	---	---	---	---
S-15-24.5	12/11/2007	24.5	---	66	0.020	0.054	0.027	0.163	---	---	---	---	---	---	---
S-15-29.5	12/11/2007	29.5	---	1.6	<0.0050	0.0062	<0.0050	<0.0100	---	---	---	---	---	---	---
S-15-34.5	12/11/2007	34.5	---	1.6	<0.0050	0.0062	<0.0050	0.0078	---	---	---	---	---	---	---
S-16-4.5*	12/11/2007	4.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-16-9.5	12/11/2007	9.5	---	<0.50	0.048	0.013	<0.0050	0.0171	---	---	---	---	---	---	---
S-16-14.5	12/11/2007	14.5	---	1.6	0.31	0.25	0.039	0.233	---	---	---	---	---	---	---
S-16-19.5	12/11/2007	19.5	---	**230**	0.042	0.21	0.18	1.28	---	---	---	---	---	---	---
S-16-24.5	12/11/2007	24.5	---	0.59	<0.0050	0.017	0.014	0.083	---	---	---	---	---	---	---
S-16-29.5	12/11/2007	29.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
S-16-34.5	12/11/2007	34.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
AS-1-5.5	12/13/2007	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
AS-1-9.5	12/13/2007	9.5	---	**1,800**	<0.0050	0.59	0.88	**29**	---	---	---	---	---	---	---
AS-1-14.5	12/13/2007	14.5	---	150	<0.12	0.27	0.29	1.93	---	---	---	---	---	---	---
AS-1-19.5	12/13/2007	19.5	---	**3,400**	**38**	**210**	**110**	**610**	---	---	---	---	---	---	---
AS-1-25.5	12/13/2007	25.5	---	91	0.26	0.99	1.1	5.1	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
AS-1-30	12/13/2007	30	---	<0.50	<0.0050	<0.0050	<0.0050	<0.0100	---	---	---	---	---	---	---
AS-1-34.5	12/13/2007	34.5	---	7.6	0.099	0.16	0.058	0.220	---	---	---	---	---	---	---
S-17-6	5/30/2008	6	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-17-11	5/30/2008	11	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-17-16	5/30/2008	16	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-17-21	5/30/2008	21	---	0.63	<0.0050	0.008	0.0086	0.043	---	---	---	---	---	---	---
S-17-26	5/30/2008	26	---	**3,000**	**3.7**	**40**	**40**	**193**	---	---	---	---	---	---	---
S-17-31	5/30/2008	31	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-17-34.5	5/30/2008	34.5	---	**210**	0.83	6.3	3.1	**17.5**	---	---	---	---	---	---	---
S-18-6	5/30/2008	6	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-18-11	5/30/2008	11	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-18-15.5	5/30/2008	15.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-18-21	5/30/2008	21	---	**5,200**	**5.3**	**96**	**120**	**630**	---	---	---	---	---	---	---
S-18-26	5/30/2008	26	---	1.3	0.021	0.080	0.026	0.158	---	---	---	---	---	---	---
S-18-31	5/30/2008	31	---	<0.50	<0.0050	0.0055	0.0234	<0.010	---	---	---	---	---	---	---
S-18-34.5	5/30/2008	34.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
OW-1-6.5	5/30/2008	6.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
OW-1-11	5/30/2008	11	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
OW-1-16	5/30/2008	16	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
OW-1-19.5	5/30/2008	19.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
EB-1	6/11/2008	23	---	**190**	<0.12	<0.12	<0.12	1.17	---	---	---	---	---	---	---
EB-2	6/11/2008	23	---	**2,500**	**5.0**	**48**	**41**	**220**	---	---	---	---	---	---	---
EB-3	6/11/2008	23	---	13	0.42	2.5	0.33	2.26	---	---	---	---	---	---	---
EB-4	6/11/2008	23	---	**2,900**	**11**	**170**	**69**	**430**	---	---	---	---	---	---	---
EB-5	6/11/2008	23	---	**2,100**	**7.4**	**98**	**47**	**298**	---	---	---	---	---	---	---
EB-6	6/11/2008	23	---	**3,300**	**4.7**	**62**	**56**	**339**	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
EB-7	6/11/2008	23	---	100	0.90	2.6	1.2	7.7	---	---	---	---	---	---	---
EB-8	6/11/2008	23	---	**3,300**	**22**	**230**	**63**	**470**	---	---	---	---	---	---	---
EB-9	6/11/2008	23	---	**3,900**	**16**	**230**	**85**	**540**	---	---	---	---	---	---	---
EB-10	6/11/2008	23	---	**3,600**	**6.3**	**120**	**74**	**470**	---	---	---	---	---	---	---
B-28-5.5	9/26/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
B-28-10.5	9/26/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
B-28-15.5	9/26/2008	15.5	---	<0.50	0.0059	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
B-28-20.5	9/26/2008	20.5	---	<0.50	0.0051	0.0054	<0.0050	0.013	---	---	---	---	---	---	---
B-28-25.5	9/26/2008	25.5	---	**1,500**	<2.5	7.0	**17**	**72**	---	---	---	---	---	---	---
B-28-30.5	9/26/2008	30.5	---	62	<0.50	<0.50	<0.50	2.6	---	---	---	---	---	---	---
B-28-35.5	9/26/2008	35.5	---	<50	<0.50	0.51	<0.50	1.4	---	---	---	---	---	---	---
B-28-40.5	9/26/2008	40.5	---	<0.50	<0.0050	0.013	0.0074	0.044	---	---	---	---	---	---	---
B-28-45.5	9/26/2008	45.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
B-29-5.5	9/26/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
B-29-10.5	9/26/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
B-29-15.5	9/26/2008	15.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
B-29-20.5	9/26/2008	20.5	---	<0.50	<0.0050	0.0055	<0.0050	0.020	---	---	---	---	---	---	---
B-29-25.5	9/26/2008	25.5	---	**5,800**	**14**	**260**	**82**	**600**	---	---	---	---	---	---	---
B-29-30.5	9/26/2008	30.5	---	0.69	0.0063	0.033	0.0087	0.058	---	---	---	---	---	---	---
B-29-35.5	9/26/2008	35.5	---	<0.50	<0.0050	0.0089	<0.0050	0.030	---	---	---	---	---	---	---
B-29-40.5	9/26/2008	40.5	---	<0.50	<0.0050	0.031	0.011	0.073	---	---	---	---	---	---	---
B-29-45.5	9/26/2008	45.5	---	<0.50	<0.0050	0.0064	<0.0050	0.020	---	---	---	---	---	---	---
S-14R-5.5	9/23/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-14R-10.5	9/23/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-14R-15.5	9/23/2008	15.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-14R-20.5	9/23/2008	20.5	---	99	<0.50	<0.50	0.66	2.8	---	---	---	---	---	---	---
S-14R-25.5	9/23/2008	25.5	---	<0.50	<0.0050	<0.0050	<0.0050	0.023	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
S-14R-30.5	9/23/2008	30.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-14R-34.5	9/23/2008	34.5	---	56	<0.50	0.73	0.60	3.2	---	---	---	---	---	---	---
S-19-5.5	9/22/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-19-10.5	9/22/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-19-15.5	9/22/2008	15.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-19-20.5	9/22/2008	20.5	---	<0.50	0.019	<0.0050	<0.0050	0.0064	---	---	---	---	---	---	---
S-19-25.5	9/22/2008	25.5	---	<0.50	0.0086	0.028	0.014	0.073	---	---	---	---	---	---	---
S-19-30.5	9/22/2008	30.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-19-35.5	9/22/2008	35.5	---	<0.50	<0.0050	<0.0050	<0.0050	0.0054	---	---	---	---	---	---	---
S-19-40.5	9/22/2008	40.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-19-45.5	9/22/2008	45.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-20-5.5	9/22/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-20-10.5	9/22/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-20-15.5	9/22/2008	15.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-20-20.5	9/22/2008	20.5	---	28 f	0.0088	0.018	0.15	0.66 f	---	---	---	---	---	---	---
S-20-25.5	9/22/2008	25.5	---	0.58	0.012	0.023	0.015	0.073	---	---	---	---	---	---	---
S-20-30.5	9/22/2008	30.5	---	58	<0.50	<0.50	<0.50	1.4	---	---	---	---	---	---	---
S-20-35.5	9/22/2008	35.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-20-40.5	9/22/2008	40.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-20-45.5	9/22/2008	45.5	---	<0.50	<0.0050	0.0067	<0.0050	0.012	---	---	---	---	---	---	---
S-21A-5.5	9/25/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-21A-10.5	9/25/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-21A-15.5	9/25/2008	15.5	---	<0.50	<0.0050	<0.0050	<0.0050	0.041	---	---	---	---	---	---	---
S-21A-20.5	9/25/2008	20.5	---	**3,000**	**12**	**140**	**61**	**360**	---	---	---	---	---	---	---
S-21A-26.5	9/25/2008	26.5	---	**3,500**	**4.8**	**29**	**38**	**170**	---	---	---	---	---	---	---
S-21B-5.5	9/23/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
S-21B-15.5	9/23/2008	15.5	---	1.9	0.028	0.11	0.030	0.38	---	---	---	---	---	---	---
S-21B-20.5	9/23/2008	20.5	---	**2,300**	<5.0	**88**	**52**	**360**	---	---	---	---	---	---	---
S-21B-25.5	9/23/2008	25.5	---	**7,100**	**37**	**250**	**130**	**760**	---	---	---	---	---	---	---
S-21B-30.5	9/23/2008	30.5	---	0.51	<0.0050	<0.0050	<0.0050	0.028	---	---	---	---	---	---	---
S-21B-35.5	9/23/2008	35.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-21B-40.5	9/23/2008	40.5	---	<0.50	<0.0050	0.012	<0.0050	0.028	---	---	---	---	---	---	---
S-21B-45.5	9/23/2008	45.5	---	<0.50	<0.0050	0.013	0.0063	0.039	---	---	---	---	---	---	---
S-22A-5.5	9/25/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-22A-10.5	9/25/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-22A-15.5	9/25/2008	15.5	---	3.5	<0.0050	<0.0050	<0.0050	0.013	---	---	---	---	---	---	---
S-22A-20.5	9/25/2008	20.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-22A-26.5	9/25/2008	26.5	---	**3,900**	**11**	**70**	**55**	**310**	---	---	---	---	---	---	---
S-22B-5.5	9/22/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-22B-10.5	9/22/2008	10.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-22B-15.5	9/22/2008	15.5	---	1.9	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-22B-20.5	9/22/2008	20.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-22B-25.5	9/22/2008	25.5	---	**1,200**	**2.6**	**13**	**17**	**81**	---	---	---	---	---	---	---
S-22B-30.5	9/22/2008	30.5	---	<0.50	<0.0050	<0.0050	<0.0050	0.0063	---	---	---	---	---	---	---
S-22B-35.5	9/22/2008	35.5	---	56	<0.50	0.83	0.69	3.7	---	---	---	---	---	---	---
S-22B-40.5	9/22/2008	40.5	---	14 f	0.012	<0.0050	<0.0050	0.29 f	---	---	---	---	---	---	---
S-22B-45.5	9/22/2008	45.5	---	<0.50	<0.0050	<0.0050	<0.0050	0.0079	---	---	---	---	---	---	---
S-23-5.5	9/24/2008	5.5	---	<0.50	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-23-10.5	9/24/2008	10.5	---	1.3	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---
S-23-15.5	9/24/2008	15.5	---	<0.50	0.0078	<0.0050	<0.0050	0.0082	---	---	---	---	---	---	---
S-23-20.5	9/24/2008	20.5	---	**3,700**	**17**	**170**	**86**	**480**	---	---	---	---	---	---	---
S-23-25.5	9/24/2008	25.5	---	**1,600**	1.5	**15**	**16**	**87**	---	---	---	---	---	---	---
S-23-30.5	9/24/2008	30.5	---	<0.50	<0.0050	<0.0050	<0.0050	0.0072	---	---	---	---	---	---	---

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*
S-23-34.5	9/24/2008	34.5	---	68	<0.0050	<0.0050	<0.0050	0.014	---	---	---	---	---	---	---
Shallow Soil (≤10 fbg) ESL [g]:			180	180	0.27	9.3	4.7	11	8.4	110	NA	NA	NA	0.48	0.044
Deep Soil (>10 fbg) ESL [g]:			180	180	2.0	9.3	4.7	11	8.4	110	NA	NA	NA	1.8	1

Notes:
fbg = Feet below grade
mg/kg = Milligrams per kilogram
TPHd = Total petroleum hydrocarbons as diesel analyzed by EPA Method 8015
TPHg = Total petroleum hydrocarbons as gasoline analyzed by EPA Method 8260B; before 12/11/06, analyzed by EPA Method 8015 unless otherwise
BTEX = Benzene, toluene, ethylbenzene, and total xylenes analyzed by EPA Method 8260B; before 10/14/2003, analyzed by EPA Method 8020
MTBE = Methyl tertiary-butyl ether analyzed by EPA Method 8260B
TBA = Tertiary-butyl alcohol analyzed by EPA Method 8260B
DIPE = Di-isopropyl ether analyzed by EPA Method 8260B
ETBE = Ethyl tertiary-butyl ether analyzed by EPA Method 8260B
TAME = Tertiary-amyl methyl ether analyzed by EPA Method 8260B
1,2-DCA = 1,2-Dichloroethane analyzed by EPA Method 8260B
EDB = 1,2-Dibromoethane analyzed by EPA Method 8260B
<x = Not detected at reporting limit x
--- = Not analyzed
ESL = Environmental screening level
* = Sample may have contained backfilled soil fgrom air-knife clearance activities.
NA = No applicable ESL
Results in **bold** equal or exceed applicable ESL
Shading indicates that soil sample location was subsequently excavated; results are not representative of residual soil.

a = Positive result appears to be a heavier hydrocarbon than diesel
b = Positive result appears to be a lighter hydrocarbon than diesel
c = Analyzed by EPA Method 7421
d = Analyzed by EPA Method 8260B

TABLE 1

HISTORICAL SOIL ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHd (mg/kg)*	*TPHg (mg/kg)*	*B (mg/kg)*	*T (mg/kg)*	*E (mg/kg)*	*X (mg/kg)*	*MTBE (mg/kg)*	*TBA (mg/kg)*	*DIPE (mg/kg)*	*ETBE (mg/kg)*	*TAME (mg/kg)*	*1,2-DCA (mg/kg)*	*EDB (mg/kg)*

e = The sample chromatographic pattern for TPH does not match the chromatographic pattern of the specified standard. Quantitation of the unknown hydrocarbon(s) in the sample was based on the specified standard.
f = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
g = San Francisco Bay Regional Water Quality Control Board commercial/industrial ESL for soil where groundwater is not a source of drinking water (Tables B and D of *Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater* , California Regional Water Quality Control Board, Interim Final - November 2007 [Revised May 2008]).

TABLE 2

HISTORICAL SOIL VAPOR ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Xylenes*	*Isobutane*	*Butane*	*Propane*
TR-V1[a]	5/20/2005	4.5	---	<1,000	<1,000	<1,000	<1,000	---	---	---
TR-V1[b]	5/20/2005	4.5	---	<1,000	<1,000	<1,000	<1,000	---	---	---
TR-V1[c]	5/20/2005	4.5	---	<1,000	<1,000	<1,000	<1,000	---	---	---
TR-V2[b]	5/20/2005	5	---	<1,000	<1,000	<1,000	<1,000	---	---	---
TR-V3[b]	5/20/2005	5	---	<1,000	<1,000	<1,000	<1,000	---	---	---
TR-V4[b]	5/20/2005	5	---	<1,000	<1,000	<1,000	<1,000	---	---	---
VP-1-5*	12/11/2007	5	<19,000	170	150	56	613	---	---	---
VP-1-9.5*	12/11/2007	9.5	**160,000**	**9,600**	4,400	1,200	12,700	---	---	---
VP-2-5	12/11/2007	5	<20,000	<2.7	6.4	<3.7	<18.7	---	---	---
VP-2-5	12/8/2008	5	<9,700	3.3	<3.2	5.1	<15	<20	<20	<46
VP-2-5	1/5/2009	5	<9,500	5.7	3.3	<3.6	<14	<20	<20	<45
VP-2-5	3/12/2009	5	<8,700	<2.4	<2.9	<3.3	<13	<18	<18	<41
VP-2-5-DUP	3/12/2009	5	<9,200	5.1	<3.0	<3.5	<14	<19	<19	<44
VP-2-5	4/27/2009	5	<8,000	<2.2	<2.6	<3.0	<12	<17	<17	<38
VP-2-5-DUP	4/27/2009	5	<8,000	<2.2	<2.6	<3.0	<12	<17	<17	<38
VP-2-9.5	12/8/2008	9.5	<9,500	13	<3.1	7.0	<14	<20	<20	<45
VP-2-9.5	1/5/2009	9.5	<8,900	<2.5	<2.9	<3.4	<14	<19	<19	<42
VP-2-9	3/12/2009	9.5	<8,500	<2.4	<2.8	<3.2	<13	<18	<18	<40
VP-2-9	4/27/2009	9.5	<8,000	<2.2	<2.6	<3.0	<12	<17	<17	<38
VP-3-5	12/11/2007	5	<17,000	<2.4	5	<3.3	<16.3	30	10	ND
VP-3-5	12/8/2008	5	<9,900	<2.7	<3.2	<3.7	<15	77	<20	<47
VP-3-5	1/5/2009	5	<8,400	<2.3	5.0	<3.2	<13	160	<17	<40
VP-3-5	3/12/2009	5	<9,200	<2.6	<3.0	<3.5	<14	<19	<19	<44
VP-3-5	4/27/2009	5	<8,800	<2.5	<2.9	<3.3	<13	<18	<18	<42
VP-3-9.5	12/11/2007	9.5	<18,000	5	20	4	36	348	---	---
VP-3-9.5	12/8/2008	9.5	<10,000	<2.8	<3.4	<3.9	<15	<21	<21	<48
VP-3-9.5	1/5/2009	9.5	<9,900	<2.8	5.5	<3.8	<15	560	21	<47
VP-3-9	3/12/2009	9.5	<9,300	<2.6	<3.1	<3.5	<14	<19	<19	<44
VP-3-9	4/27/2009	9.5	<8,600	<2.4	<2.8	<3.3	<13	<18	<18	<41
VP-4-5	12/11/2007	5	<18,000	<2.6	35	<3.5	14	---	6.9	---
VP-4-5	12/8/2008	5	**170,000**	<11	<13	<15	<60	55,000	1,200	7,900
VP-4-5 DUP	12/8/2008	5	**170,000**	<11	<13	<15	<61	84,000	1,200	8,600
VP-4-5	1/5/2009	5	<8,300	<2.3	4.8	<3.1	<13	61	<17	<39
VP-4-5	3/12/2009	5	<8,800	<2.5	<2.9	<3.3	<13	<18	<18	<42

TABLE 2

HISTORICAL SOIL VAPOR ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Xylenes*	*Isobutane*	*Butane*	*Propane*
VP-4-5	4/27/2009	5	<8,400	<2.3	<2.8	<3.2	<13	<17	<17	<40
VP-4-9.5	12/11/2007	9.5	<16,000	<2.2	79	4.3	40.4	ND	ND	ND
VP-4-9.5	12/8/2008	9.5	**26,000**	<2.6	4.2	<3.5	<14	8,800	120	94
VP-4-9.5	1/5/2009	9.5	<10,000	<2.8	4.3	<3.8	<15	1,900	<21	120
VP-4-9.5-DUP	1/5/2009	9.5	<8,900	<2.5	4.4	<3.4	<14	1,600	19	<42
VP-4-9	3/12/2009	9.5	<8,500	<2.4	<2.8	<3.2	<13	<18	<18	<40
VP-4-9	4/27/2009	9.5	<8,600	<2.4	<2.8	<3.3	<13	<18	<18	<41
Outdoor Ambient	5/29/2003		<19,000	16	16	<3.1	<9.2	---	---	---
Outdoor Ambient	1/5/2009		<8,700	2.5	5.4	<3.3	<13	<18	<18	<41
Outdoor Ambient	3/12/2009		<8,900	<2.5	<2.9	<3.4	<13	<18	<18	<42
Outdoor Ambient	4/27/2009		<8,700	<2.4	<2.9	<3.3	<13	<18	<18	<41
SVP-1	11/21/2008		<230	---	---	---	---	---	---	---
SVP-1-DUP	11/21/2008		460	---	---	---	---	---	---	---
SVP-1	1/5/2009		<9,300	<2.6	<3.1	<3.5	<14	<19	<19	<44
SVP-1	3/12/2009		<8,500	<2.4	<2.8	<3.2	<13	<18	<18	<40
SVP-1-DUP	3/12/2009		<11,000	<3.0	<3.5	<4.0	<16	<22	<22	<50
SVP-1	4/27/2009		<8,400	<2.3	<2.8	<3.2	<13	<17	<17	<40
SVP-2	11/21/2008		360	---	---	---	---	---	---	---
SVP-2	1/5/2009		**13,000**	<2.6	4.4	<3.6	<14	1,800	51	90
SVP-2	3/13/2009		<10,000	<2.9	<3.4	<3.9	<16	<21	<21	<48
SVP-2	4/27/2009		<9,200	<2.6	<3.0	<3.5	<14	25	<19	<44
SVP-3	11/21/2008		<230	---	---	---	---	---	---	---
SVP-3	1/5/2009		<8,100	<2.4	<2.9	<3.3	<13	<18	130	<41
SVP-3-DUP	1/5/2009		<10,000	<3.2	<3.8	<4.4	<17	<24	150	<54
SVP-3	3/12/2009		<9,200	<2.6	<3.0	<3.5	<14	<19	<19	<43
SVP-3	4/27/2009		<9,900	<11	<13	<15	<60	<82	<82	<190
SVP-3-DUP	4/27/2009		<8,300	<9.3	<11	<13	<50	<69	<69	<160
Indoor Ambient Air	11/21/2008		510	---	---	---	---	---	---	---
Indoor Ambient Air DUP	11/22/2008		510	---	---	---	---	---	---	---
Indoor Ambient Air	12/8/2008		<9,900	<2.7	4.2	<3.7	<15	<20	<20	<47
Indoor Ambient Air	1/5/2009		<9,300	<2.6	4.9	<3.5	<14	<19	<19	<44
Indoor Ambient Air	3/12/2009		<8,500	<2.4	3.2	<3.2	<13	28	<18	<40
Indoor Ambient Air	4/27/2009		<7,900	3.2	12	<3.0	<12	62	63	<37
Residential Land Use ESL [d]:			***29,000***	***280***	***180,000***	***3,300***	***58,000***	***NA***	***NA***	***NA***
Commercial/Industrial Land Use ESL [d]:			***10,000***	***84***	***63,000***	***980***	***21,000***	***NA***	***NA***	***NA***

TABLE 2

HISTORICAL SOIL VAPOR ANALYTICAL DATA
FORMER SHELL SERVICE STATION
461 8TH STREET, OAKLAND, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Xylenes*	*Isobutane*	*Butane*	*Propane*

Notes:

All results in micrograms per cubic meter ($\mu g/m^3$) unless otherwise indicated.
fbg = Feet below grade
TPHg = Total petroleum hydrocarbons as gasoline analyzed by Modified EPA Method TO-3 GC/FID or EPA Method TO-3M.
Benzene, tolunene, ethylbenzene, and total xylenes (BTEX) analyzed by Modified EPA Method TO-15 or EPA Method TO-15.
Isobutane, butane, and propane by analyzed by EPA Method TO-15.
<x = Not detected at reporting limit x
--- = Not analyzed
ESL = Environmental screening level
NA = No applicable ESL
Results in **bold** exceed ESL.
* = VP-1 destroyed
VP = Vapor probe
SVP = Sub slab vapor probe
Shading indicates that the soil vapor probe location was subsequently excavated; results are likely not representative of current soil vapor conditions.

a = Sample collected after 1 purge volume; BTEX analyzed by EPA Method 8260B
b = Sample collected after 3 purge volumes; BTEX analyzed by EPA Method 8260B
c = Sample collected after 7 purge volumes; BTEX analyzed by EPA Method 8260B
d = San Francisco Bay Regional Water Quality Control Board ESLs for shallow soil gas (Table E of Screening for Environmental Concerns at Sites With Contaminated Soil and Groundwater, California Regional Water Quality Control Board, Interim Final - November 2007 [Revised May 2008])

APPENDIX A

SITE HISTORY

SITE HISTORY

The property was leased by American Oil Company from at least 1965 until 1972, when the lease was assigned to Shell Oil Products US (Shell). A Shell-branded service station operated on the property from 1972 to 1980. The underground storage tanks (USTs) associated with the former Shell service station were removed after Shell terminated operations at the site in May 1980.

1978 - 1980 Separate Phase Hydrocarbons (SPHs) Discovered in Bay Area Rapid Transit's (BART's) KE Line Tunnel: In January 1979, BART notified Shell that they had found SPHs in a tunnel under the intersection of 7th Street and Broadway. Shell tested the product lines at the subject site and found a pressure leak. Shell replaced the product lines in January 1979. Shell also tested the USTs' tightness, and they passed. According to BART's January 10, 1979 to December 3, 1981 *Bart Recovery Project Log* and Groundwater Technology, Inc.'s (GTI's) 1981 *Considerations on Infiltration of Gasoline into BART KE Line* report, one observation well was installed to a depth of 25 feet below grade (fbg) concurrent with piping replacement, and no contamination was reported. SPH analyses conducted in January 1979 and in May 1981 identified the SPHs in the BART tunnel as Shell Regular gasoline. Between October 1979 and April 1980, approximately 4,400 gallons of water and gasoline were removed from the BART tunnel. The Shell-branded station discontinued operations in May 1980, and all existing improvements, tanks, and associated piping were removed. No UST removal or piping removal reports are available.

1981 - 1988 Subsurface Investigations: In August and September 1981, GTI installed seven monitoring wells (L-1 through L-7) to delineate the extent of hydrocarbons in groundwater. Based on groundwater sampling results, in December 1981, Gettler-Ryan, Inc. (G-R) installed a recovery well adjacent to well L-6. Wells L-1 through L-3 were destroyed during construction of the BART tunnels in the mid-1980s. Well destruction records are not available. Wells L-4, L-5, and L-6 were renamed S-4, S-5, and S-6. G-R began gauging wells S-4 through S-6 in 1986 and collecting groundwater samples for analysis in 1988. GeoStrategies Inc.'s (GSI's) September 14, 1993 *Work Plan* summarizes groundwater extraction (GWE) activities associated with the recovery well. Enviros, Inc.'s (Enviros') November 2, 1993 *Work Plan for Soil and Groundwater Sampling* summarizes other investigation activities.

1982 - 2004 GWE: From February 1982 to August 1982, G-R conducted GWE from the recovery well located adjacent to well L-6. Enviros' November 2, 1993 *Work Plan for Soil and Groundwater Sampling* summarizes the GWE system operation.

In October 1987, G-R conducted mobile GWE from well S-5 and reportedly pumped approximately 50 gallons of SPHs from the well. G-R's January 9, 1989 monitoring report summarizes this GWE event.

In the third quarter of 1992, GSI conducted mobile GWE from well S-5, which removed approximately 200 gallons of groundwater containing less then one percent SPHs. This event is mentioned in GSI's January 12, 1993 status report.

In May 1993, Crosby and Overton, Inc. conducted mobile GWE from well S-5, which removed approximately 150 gallons of groundwater and SPHs. This event is summarized in GSI's July 6, 1993 *Quarterly Report.*

From July 1993 to July 2004, periodic mobile GWE was conducted from wells S-5 and S-6, which removed approximately 6,754 gallons of groundwater containing approximately 2.8 pounds of total petroleum hydrocarbons as gasoline (TPHg) and 0.64 pounds of benzene. Cambria Environmental Technology, Inc.'s (Cambria's) *Groundwater Monitoring Report – Second Quarter 2004* provides tabulated GWE data for this period.

1987 BART Tunnel Inspection: In November 1987, G-R conducted an inspection of the KE line tunnel with BART personnel. No gasoline seepage was observed. G-R's January 9, 1989 monitoring report summarizes the inspection results.

1993 Phase I Assessment: GSI's June 30, 1993 *Phase I Preliminary Site Assessment* identified seven sites with known UST leaks within a one-quarter mile radius of the site including an Oakland Police Department (OPD) site located down gradient (southwest). The *Bart Recovery Project Log* noted that leaking USTs were replaced at the OPD site in October 1979 and that OPD had received product deliveries from a local Shell gasoline distributor. In addition, a permit to repair the product lines and dispensers at the OPD site was taken out in 1984 by Egan and Paradiso Company, but no additional information was available. The OPD site is not listed in Geotracker or on Alameda County Environmental Health's website.

1994 Subsurface Investigation: During July 1994, Enviros drilled nine soil borings (B-1 through B-9) in the vicinity of the former pump islands and the former USTs. Soil samples collected from the borings near the dispenser islands contained up to 15 milligrams per kilogram (mg/kg) TPHg and 0.24 mg/kg benzene. No TPHg or benzene was detected in soil samples from borings drilled in the area of the former piping or the former USTs. This investigation is described in Enviros' August 16, 1994 *Site Investigation Report.*

1994 - 1995 Subsurface Investigation: During December 1994, Enviros installed three monitoring wells (S-8, S-9, and S-10). Soil samples collected from the well borings contained up to 760 mg/kg TPHg (S-10 at 11.5 fbg) and 0.014 mg/kg benzene (S-8 at 21.5 fbg). Enviros' February 14, 1995 *Site Investigation Report and Quarterly Monitoring Report – First Quarter 1995* provides investigation results.

1995 SPH Removal: From January 1995 to October 1995, Blaine Tech Services, Inc. removed approximately 3.1 liters of SPHs by bailing. SPH removal details are provided in Enviros' quarterly monitoring reports for this period.

2002 Sensitive Receptor Survey (SRS): In February 2002, Cambria submitted an SRS which identified a school approximately 1,300 feet west of the site and the Oakland Inner Harbor approximately 2,400 feet south-southwest of the site. Cambria's review of California Department of Water Resources well records did not identify any water-producing wells within one-half mile of the site. Cambria's review of utility records from the City of Oakland and the East Bay Municipal Utilities District did not identify any utilities which would provide preferential pathways for groundwater migration; however, five BART tunnels were identified which intercept groundwater in the vicinity. SRS details are provided in Cambria's February 11, 2002 *SRS, Well Survey, Conduit Study, and Cross-Sectional Diagram Report.*

2003 Subsurface Investigation: In October 2003, Cambria drilled one soil boring (HA-1) within 7th Street, south of the site. No TPHg, benzene, or methyl tertiary-butyl ether (MTBE) was detected in soil samples. A grab groundwater sample from the boring contained 6.3 micrograms per liter (µg/L) MTBE. Investigation activities are described in Cambria's December 16, 2003 *Subsurface Investigation Report.*

2004 Subsurface Investigation: During May 2004, Treadwell & Rollo, Inc. (T&R) drilled four soil borings (TR-1 through TR-4) and four soil vapor borings (TR-V1 through TR-V4) on site to collect soil and soil vapor samples. TPHg and volatile organic compounds were not detected in soil samples, and benzene, toluene, ethylbenzene, and xylenes (BTEX) were not detected in soil vapor samples collected. Investigation results are summarized in T&R's March 27, 2006 *Subsurface Investigation* report.

2006 Subsurface Investigation: During December 2006, Cambria drilled 14 soil borings (B-10 through B-23) to determine the extent of hydrocarbon impacts in soil. Fuel oxygenates were not detected in any of the soil samples with the exception of up to 0.083 mg/kg of tertiary-butyl alcohol in three soil samples from borings B-13 and B-14. Lead scavengers (1,2-dichloroethane [1,2-DCA] and ethylene dibromide [EDB]) were not

not detected in soil samples. Grab groundwater samples contained up to 960,000 µg/L TPHg (B-22) and 24,000 µg/L benzene (B-10). No fuel oxygenates were detected in the grab groundwater samples. Up to 410 µg/L 1,2-DCA was detected in grab groundwater samples, and 52 µg/L EDB was reported in one grab groundwater sample (B-12). Investigation results are summarized in Cambria's March 2, 2007 *Subsurface Investigation Report*

2007 - 2008 Subsurface Investigation and Pilot Testing: In November and December 2007, Conestoga-Rovers & Associates (CRA) drilled four soil borings (B-24 through B-27) and installed soil vapor probes (VP-1 through VP-4) in the borings, installed five monitoring wells (S-12 through S-16), and installed an air sparge well (AS-1). In January 2008, CRA conducted a dual-phase extraction (DPE) pilot test and an air sparging (AS) pilot test. CRA conducted the DPE pilot test using wells S-8, S-9, S-13, S-14, and S-16. The theoretical vacuum radius of influence was up to 60 feet, but more consistently around 45 feet with an average groundwater flow rate of 3.42 gallons per minute. All wells, except for well S-14, were dewatered to near the bottom of the well (30 to 35 fbg). CRA conducted the AS pilot test injecting into well AS-1. A flow rate of 20 cubic feet per minute was achieved at the maximum injection pressure of 25 pounds per square inch. Based on higher vapor concentrations detected during the AS pilot test, CRA concluded that vapor-phase mass removal would be greater with a soil vapor extraction and AS system than with a DPE system. These activities are documented in CRA's February 25, 2008 *Site Investigation and Pilot Test Report, and Corrective Action Plan.*

2008 Subsurface Investigation: In May 2008, CRA properly destroyed four wells (S-14, S-15, S-16, and AS-1) and installed three wells (S-17, S-18, and OW-1) to accommodate source area excavation. Soil samples from well borings S-17 and S-18 contained up to 5,200 mg/kg TPHg, 5.3 mg/kg benzene, 96 mg/kg toluene, 120 mg/kg ethylbenzene, and 630 mg/kg xylenes. No TPHg or BTEX was detected in soil samples collected from well OW-1. These activities are documented in CRA's August 20, 2008 *Well Destruction and Installation Report.*

2008 Soil Excavation and In Situ Chemical Oxidation (ISCO) Piping Installation: In June 2008, G-R excavated soil to approximately 20 fbg in the southeastern portion of the site. CRA collected 10 soil samples (EB-1 through EB-10) by potholing the excavation bottom to approximately 23 fbg. The soil samples contained up to 3,900 mg/kg TPHg, 22 mg/kg benzene, 230 mg/kg toluene, 85 mg/kg ethylbenzene, and 540 mg/kg xylenes. Following soil sampling, three ISCO injection galleries were placed in the excavation. G-R excavated approximately 1,340 tons of soil for proper off-site disposal. CRA's September 17, 2008 *Soil Sampling and ISCO Piping Installation Report* provides details of the excavation and ISCO gallery installation.

2009 Subsurface Investigation: In September 2009, CRA installed four deep wells (S-19, S-20, S-21B, and S-22B) and four shallow wells (S-14R, S-19, S-20, and S-23) to facilitate planned ISCO pilot testing and drilled two soil borings (B-28 and B-29) to delineate vertical soil impact in the southern portion of the site. Soil samples from the well and soil borings contained up to 7,100 mg/kg TPHg, 37 mg/kg benzene, 260 mg/kg toluene, 130 mg/kg ethylbenzene, and 760 mg/kg xylenes. This investigation is detailed in CRA's December 8, 2008 *Subsurface Investigation Report.*

2008 - 2010 ISCO Pilot Testing: In December 2008 and January 2009, CRA performed two rounds of ISCO pilot testing using the injection gallery to treat hydrocarbon impacts to soil within the source area. In March 2009, August 2009, and April 2010, CRA continued the ISCO pilot testing using injection into monitoring wells. CRA's July 17, 2009 *ISCO Pilot Test Report* details the three initial events ISCO injection events, and details of the August 2009 event are presented in CRA's November 30, 2009 *ISCO Pilot Test Report.* CRA's September 21, 2010 *ISCO Pilot Test Report* details the April 2010 ISCO event.

2010 Down-Gradient Receptor Survey: In March 2010, CRA conducted inquiries concerning potential receptors at BART and at buildings along Broadway between 6th and 8th Streets, which identified five buildings with basements. Three of the basements also contained sumps. No dewatering systems were identified. Survey results are summarized in CRA's March 30, 2010 *Down-Gradient Receptor Survey.*

2010 - 2011 Sump Sampling: In November 2010, CRA sampled two sumps in the OPD building located on the southwest corner of 7th Street and Broadway, and in February 2011, CRA sampled a sump in the BART tunnel below the southeast corner of 7th Street and Broadway. No chemicals of concern were detected in water samples from the BART sump and one of the sumps in the OPD building. The water sample collected from the second sump in the OPD building contained 93 µg/L TPHg, 38 µg/L benzene, and 4.2 µg/L ethylbenzene. The BART sump water sample contained 62,000 mg/L sulfate, and one OPD sump water sample contained 100 mg/L sulfate. CRA's April 13, 2011 *Sump Sampling Report* provides details of this investigation.

Groundwater Monitoring: Groundwater has been monitored since August 1981. Depth to groundwater has ranged from 12.82 to 28.12 fbg. Groundwater flow direction is typically southwesterly.