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TRANSMITTAL

DATE: November 5, 2009

REFERENCE NO.: 240503

PROJECT NAME: 6039 College Avenue, Oakland

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

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Alameda County
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QUANTITY	DESCRIPTION
1	Soil Vapor Probe Installation and Soil Vapor Sampling Work Plan

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

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

Copy to: Denis Brown, Shell Oil Products US, 20945 S. Wilmington Avenue, Carson, CA 90810
Russell J. Bruzzone, Inc., c/o Joan Bruzzone, 899 Hope Lane, Lafayette, CA 94549
Montrose Investment Co., Attn: Jim Graham, 242 Rivera Circle, Greenbrae Marina, Larkspur, CA 94939
Claremont Enterprises, Attn: Miriam Clark, 6013 Auburn Avenue, Oakland, CA 94618
SF Data Room (electronic copy)

Completed by: Peter Schaefer Signed: Peter Schaefer

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Shell Oil Products US
HSE - Environmental Services
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Email denis.l.brown@shell.com

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

Re: Shell-branded Service Station
6039 College Avenue
Oakland, California
SAP Code 135685
Incident No. 98995745
ACEH Case No. RO0000469

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.

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

Sincerely,

Denis L. Brown
Project Manager

SOIL VAPOR PROBE INSTALLATION AND SOIL VAPOR SAMPLING WORK PLAN

SHELL-BRANDED SERVICE STATION
6039 COLLEGE AVENUE
OAKLAND, CALIFORNIA

SAP CODE	135685
INCIDENT NO.	98995745
AGENCY NO.	RO0000469

Prepared by:
Conestoga-Rovers & Associates

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NOVEMBER 5, 2009
REF. NO. 240503 (4)
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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 prior to obtaining case closure as discussed in Alameda County Environmental Health (ACEH) in our March 19, 2009 meeting.

The site is a Shell-branded service station located on the southern corner of College Avenue and Claremont Avenue in Oakland, California (Figure 1). Currently, the site layout consists of a station building, three underground storage tanks (USTs), and two dispenser islands (Figure 2). The area surrounding the site is of mixed commercial and residential use.

A summary of previous work performed at the site and additional background information is contained in Appendix A.

2.0 SOIL VAPOR PROBE INSTALLATION

CRA proposes to install six soil vapor probes on site to assess soil vapor concentrations beneath the site at the locations shown on Figure 2. Specific tasks are described below.

2.1 PERMITS

CRA will obtain boring permits 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 locator service prior to drilling.

2.4 PROBE INSTALLATION

To assess soil vapor concentrations beneath the site, CRA proposes to install six soil vapor probes (SVP-1 through SVP-6) into the subsurface beneath the site (Figure 2). SVP-1 is proposed in the area of the former 1940's UST complex and dispensers, SVP-2 is proposed to the north of former 1957 UST complex and adjacent to the current easterly dispenser island, SVP-3 is proposed adjacent to the current kiosk, SVP-4 and SVP-5 will be installed adjacent to the current UST complex, and SVP-6 is proposed in the area of the former 1940's UST complex and adjacent to the current westerly dispenser island.

Assuming the absence of subsurface obstructions, CRA will advance six soil borings (SVP-1 through SVP-6) to 5 feet below grade (fbg) using an air-knife rig in the approximate locations shown on Figure 2. 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 1-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 screened interval, 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 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.

3.0 SOIL VAPOR PROBE SAMPLING

At least 2 weeks following probe installation, soil vapor samples will be collected from each sampling point in Tedlar bags. Installation and sampling is affected by rain. It is CRA standard procedure to allow two days or more after a heavy rain event prior to collecting soil vapor samples.

3.1 PROBE SAMPLING

CRA will sample soil vapor probes SVP-1 through SVP-6 using a vacuum pump and Tedlar bags. 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, documented on a chain-of-custody, placed in a protective box at room temperature, and submitted to a California State-Certified laboratory for analysis within 72 hours.

3.2 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 our field notes. Helium will continue to be introduced to the containment unit during soil gas probe purging and sampling.

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.

3.3 CHEMICAL ANALYSES

Vapor samples will be analyzed for benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260B and for helium by ASTM D Method 1946 (M).

4.0 REPORT PREPARATION

Following receipt of 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.

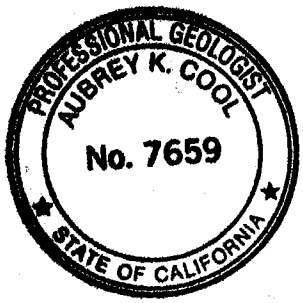
5.0 SCHEDULE

CRA will implement the soil vapor probe installation activities upon approval of this work plan by the ACEH and receipt of a drilling permit from ACPWA.

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

Peter Schaefer, CEG, CHG

Aubrey K. Cool, PG



FIGURES

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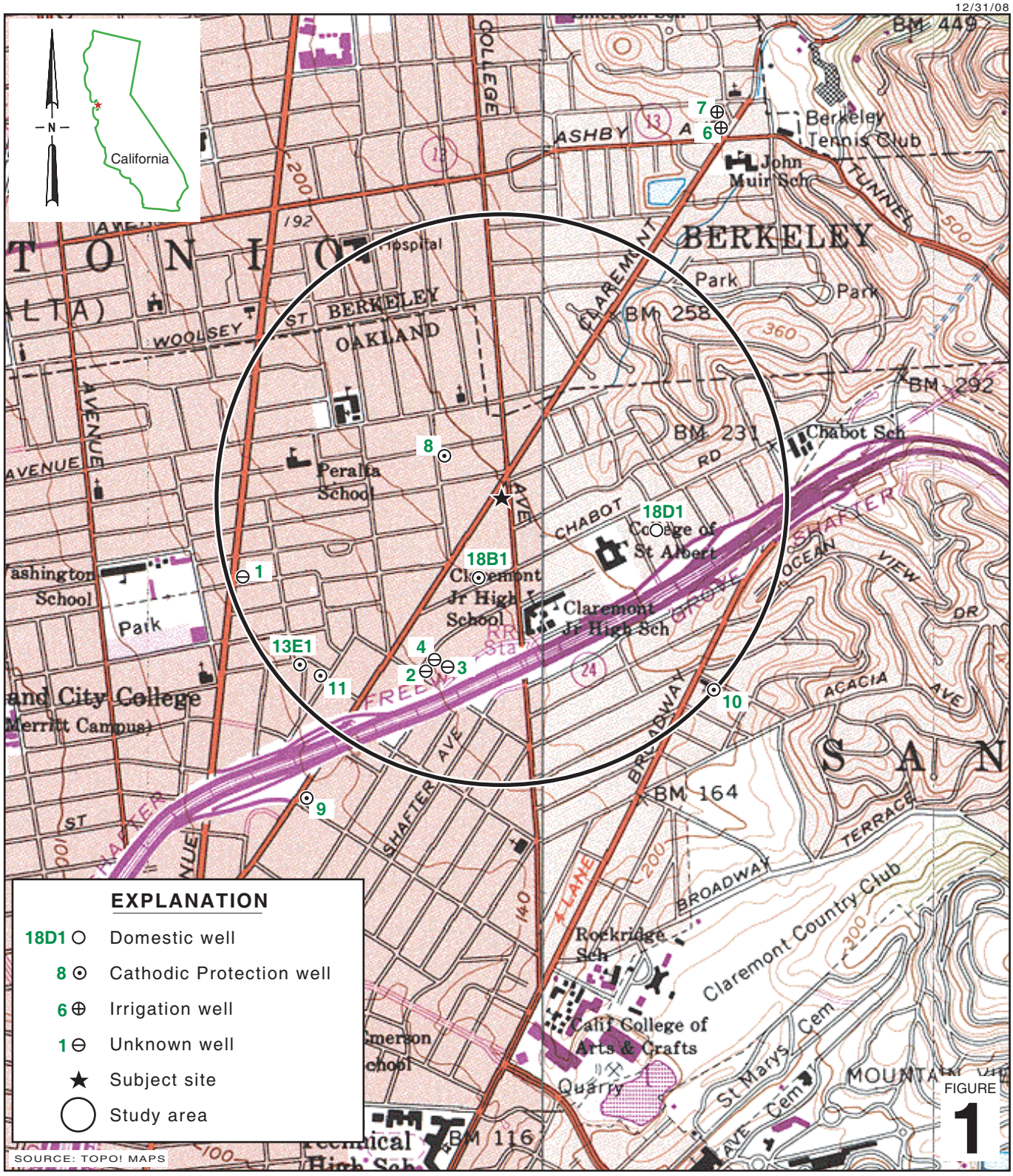


FIGURE
1

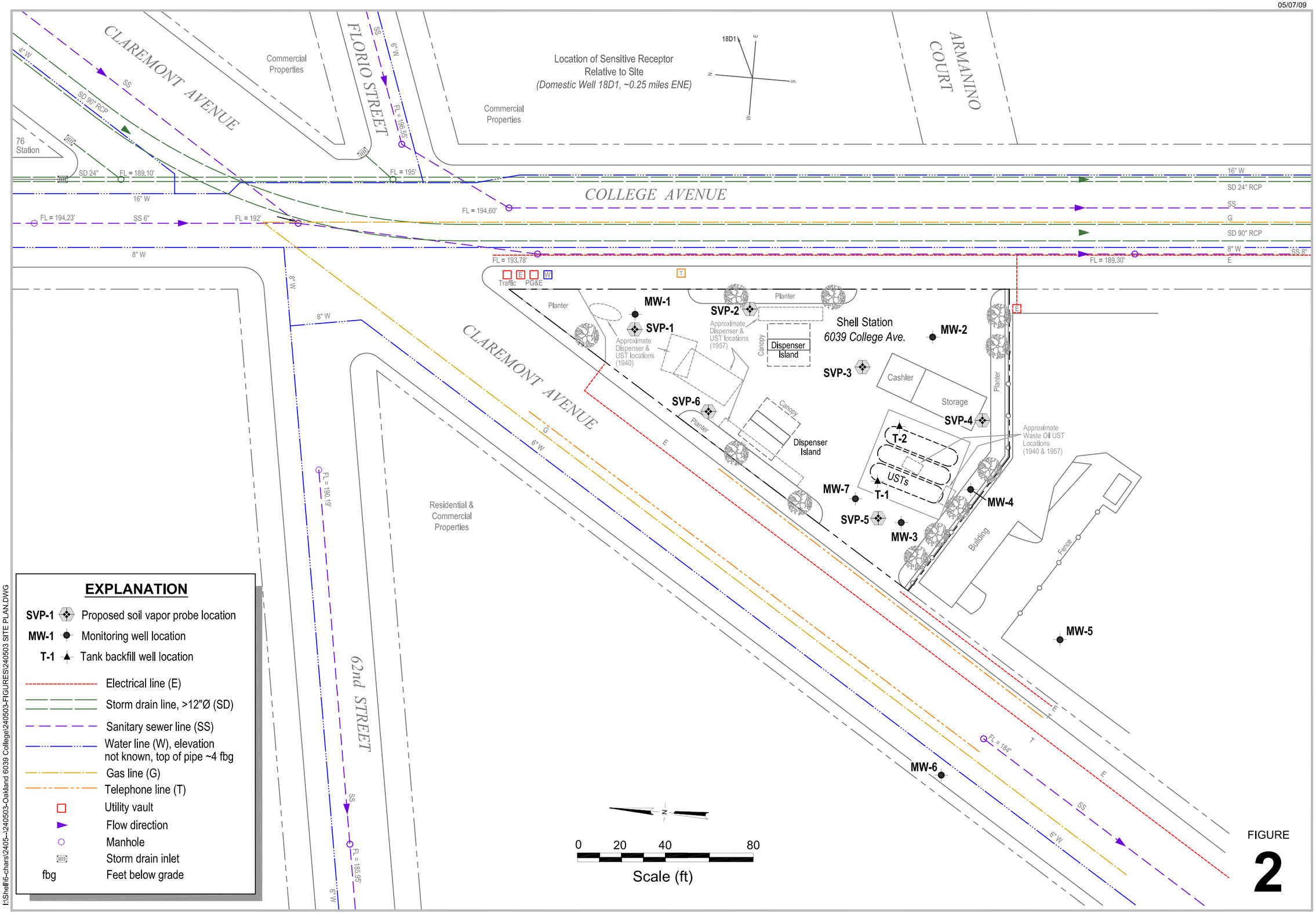
Shell-branded Service Station
6039 College Avenue
Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

05/07/09

Site Plan



EXPLANATION

- SVP-1 — Proposed soil vapor probe location
- MW-1 — Monitoring well location
- T-1 — Tank backfill well location
- Electrical line (E)
- Storm drain line, >12"Ø (SD)
- Sanitary sewer line (SS)
- Water line (W), elevation not known, top of pipe ~4 fbg
- Gas line (G)
- Telephone line (T)
- Utility vault
- Flow direction
- Manhole
- Storm drain inlet
- fbg — Feet below grade

FIGURE **2**

Shell-branded Service Station
6039 College Avenue
Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

I:\Shell\6-chars\2405--\240503-Oakland 6039 College\240503-FIGURES\240503 SITE PLAN.DWG

APPENDIX A

SITE HISTORY

SITE HISTORY

1957 Underground Storage Tank (UST) Removal and Replacement: According to Shell's records, one 550-gallon, and three 1,000-gallon steel USTs containing gasoline, and one 110-gallon single-walled steel waste-oil tank were removed in 1957. These tanks were apparently installed when the station first opened in 1940. The tanks were replaced by three 5,000-gallon leaded gasoline tanks and one 1,000-gallon waste-oil tank, all of single-wall steel construction.

1978 UST Removal and Installation: According to Shell's records, one 8,000-gallon and three 5,000-gallon steel USTs and one 1,000-gallon waste oil tank were removed in 1978. It is not clear from the available data when the 8,000-gallon tank was installed. The tanks were replaced by three 10,000-gallon fiberglass USTs for gasoline storage.

1989 Unauthorized Release: In September 1989, Alameda County Environmental Health received notification of an unauthorized release from a UST. The source of the release was reported as a slight weep at the piping connection to the submersible pump for a gasoline tank.

1990 Soil Borings: In January 1990, Harding Lawson Associates (HLA) drilled soil borings B-1 through B-6 to a depth of approximately 25 feet below grade (fbg). Up to 610 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg), 5,900 mg/kg total petroleum hydrocarbons as diesel (TPHd), 110,000 mg/kg total petroleum hydrocarbons as motor oil, and 0.57 mg/kg benzene were detected in soil samples from borings B-3 and B-6. Petroleum hydrocarbon concentrations were near laboratory detection limits or not detected in soil samples collected from borings B-1, B-2, B-4, and B-5. Details of the investigation are included in HLA's April 13, 1990 *Quarterly Technical Report, First Quarter 1990.*

1990 Soil Boring and Well Installations: In February 1990, HLA drilled and installed groundwater monitoring wells MW-1 through MW-4 to a depth of 25 fbg. Up to 230 mg/kg TPHg and 1.1 mg/kg benzene were detected in soil samples collected from well borings MW-3 and MW-4. Petroleum hydrocarbon concentrations were near laboratory detection limits or not detected in soil samples collected from well boring MW-2. Details of the investigation and well installations are included in HLA's July 10, 1990 *Quarterly Technical Report, Second Quarter 1990.*

1991 Soil Boring and Well Installation: In August 1991, HLA installed monitoring well MW-5 to a depth of 28 fbg. Although 23 mg/kg of a petroleum mixture other than gasoline was detected in a soil sample from 16 fbg, no benzene was detected in any

samples collected. HLA's October 10, 1991 *Quarterly Technical Report, Third Quarter 1991* documents the investigation and well installations.

1993 Soil Boring and Well Installation: In March 1993, Weiss Associates (WA) drilled soil borings BH-A through BH-E and converted boring BH-E into monitoring well MW-6. Up to 580 mg/kg TPHg, 0.42 mg/kg benzene, and 930 mg/kg petroleum oil and grease were detected in soil samples collected from borings BH-A, BH-C, and BH-D. No petroleum hydrocarbons were detected in soil samples collected from boring BH-B and only 3.5 mg/kg TPHd was detected in soil samples collected from boring BH-E (well MW-6). The report detailing this investigation is unavailable at this time.

Separate-Phase and Dissolved-Phase Hydrocarbon Removal: Weekly extraction of separate-phase hydrocarbons (SPHs) and dissolved-phase hydrocarbons was initiated at this site on September 22 and November 10, 1999. Advanced Cleanup Technologies, Inc. of Benicia, California extracted SPHs and groundwater from wells MW-3 and MW-4 with a vacuum truck. Beginning November 10, 1999, Blaine Tech Services, Inc. (Blaine) of San Jose, California assumed the weekly purging events as the volume of groundwater and SPHs removed each week was not sufficient to warrant using a vacuum truck. Due to the absence of SPHs in MW-4, weekly purging events by Blaine were discontinued on June 8, 2000. No SPHs were detected in the first quarter of 2001. SPHs reappeared in the second and third quarters of 2001, and monthly extraction was resumed in December 2001. No SPHs were detected in the first quarter of 2005 and monthly extraction was suspended. Mobile groundwater extraction removed an approximate total of 2.6 pounds of hydrocarbons, 0.15 pounds of benzene, and 2.5 pounds of methyl tertiary-butyl ether (MTBE).

February 1998 Dispenser and Piping Upgrade Soil Sampling: In February 1998, Cambria Environmental Technology, Inc. (Cambria) collected soil samples for analysis during an upgrade of the site's four gasoline dispensers. The maximum hydrocarbon concentrations were detected in soil samples collected at Dispenser C. TPHg, TPHd, and benzene were detected at concentrations of 5,300 mg/kg, 420 mg/kg, and 10 mg/kg, respectively. Samples from the other dispenser locations contained significantly lower concentrations. Soil sampling details are included in Cambria's April 30, 1998 *Dispenser Soil Sampling Report.*

March 1998 Potential Receptor Survey: In March 1998, Cambria completed a potential receptor survey to identify sensitive groundwater receptors within a ½-mile radius of the site. Three surface water bodies and one potential receptor well were located within the study area. However, due to their distance and location up gradient and cross-gradient of the site, Cambria concluded that none would be impacted by

hydrocarbons detected at the subject site. Survey details are included in Cambria's March 5, 1998 *Potential Receptor Survey Report.* Figure 1 includes area well survey results.

August 2001 Site Conceptual Model (SCM) and Well Receptor Survey and Conduit Studies: In 2001, Shell voluntarily instructed Cambria to prepare and submit an SCM and well receptor survey for the site. The receptor survey identified three surface water bodies and five potential receptor wells within a ½-mile radius of the site. Due to either their distance from the site or their location up gradient and cross-gradient of the site, it is unlikely that any of these wells would be impacted by hydrocarbons originating from the site. The conduit investigation findings indicated that there is potential for preferential pathway migration of petroleum hydrocarbons in existing horizontal utility trenches. Cambria's August 9, 2001 *Site Conceptual Model and Well Receptor Survey* report presents the SCM and details of the well receptor and conduit studies.

May 2004 Dispenser and Piping Upgrade Soil Sampling: In May 2004, Cambria collected soil samples for analysis during an upgrade of the site's fueling system. MTBE and benzene were not detected in any soil samples collected during the upgrade activities. TPHg was detected in only one sample (P-3-4'), at a concentration of 17 mg/kg. Cambria's July 7, 2004 *Dispenser and Piping Upgrade Sampling Report* documents the soil sampling.

September 2005 Subsurface Investigation: In September 2005, Cambria advanced six soil borings to assess subsurface conditions off site and down gradient of the site and on site in the vicinity of the fuel dispensers and USTs. Borings SB-1, SB-3, SB-6, and SB-8 were advanced to 35 fbg, SB-7 to 45 fbg, and SB-2 to 50 fbg. Soil samples were collected every 5 feet for soil description, possible chemical analysis, and headspace analysis. TPHg was detected in nine soil samples, at concentrations up to 740 mg/kg. The hydrocarbon impact to soil in the area investigated was minimal and likely indicative of impacted groundwater.

Grab samples of the first-encountered groundwater were collected from each boring. TPHg was detected in five groundwater samples, at concentrations up to 43,000 micrograms per liter (µg/l). Benzene was detected in SB-8 at a concentration of 170 µg/l. MTBE was detected in all samples at concentrations up to 340 µg/l. Tertiary-butyl alcohol (TBA) was detected in five samples, at concentrations up to 3,400 µg/l. Di-isopropyl ether (DIPE) was detected in two samples, with concentrations of 210 µg/l and 380 µg/l in samples from SB-2 and SB-8, respectively. Ethylene dibromide (EDB) was detected in SB-7 at a concentration of 2.9 µg/l. Cambria's December 14, 2005 *Subsurface Investigation Report* presents investigation details.

Groundwater Monitoring Program: There are five on-site groundwater monitoring wells associated with the site (MW-1 through MW-4 and MW-7) and two off-site wells (MW-5 and MW-6) which are sampled semiannually during the first and third quarters.