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CAMBRIA

July 13, 2005

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

Re: **Site Investigation Work Plan**
Shell-branded Service Station
1601 Webster Street
Alameda, California
Incident # 97564701
SAP Code 135032
ACHCSA # 13-503

Dear Mr. Wickham:

Cambria Environmental Technology, Inc. (Cambria) prepared this work plan on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell) in response to a request from the Alameda County Health Care Services Agency (ACHCSA) in correspondence dated May 13, 2005. This correspondence was written to respond to recommendations presented in Cambria's *Soil and Groundwater Investigation Report* dated February 18, 2005 to further assess the soil and groundwater conditions at the above-referenced site. The proposed scope of work presented in this document complies with the Alameda County Health Care Services Agency (ACHCSA) and Regional Water Quality Control Board (RWQCB) guidelines.

SITE LOCATION AND DESCRIPTION

The subject property is an operating Shell-branded service station located on the northwest corner of Webster Street and Lincoln Avenue in Alameda, California (Figure 1). The station layout includes three underground storage tanks (USTs), a former waste oil UST, two current dispensers and two former dispensers islands, a station building, and a kiosk (Figure 2). The local topography is flat with a site elevation at approximately 13 feet above mean sea level. The site is surrounded by a mix of commercial and residential development.

Cambria Environmental Technology, Inc.

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SITE BACKGROUND AND PROJECT HISTORY

A detailed discussion of the site conditions, project background, previous site investigations and remedial activities at this site were presented in Cambria's above-referenced February 18, 2005 *Soil and Groundwater Investigation Report*. For brevity in this document, **Appendix A** contains the detailed historical information, including the discussion of the August 2004 product release and subsequent emergency response and remedial efforts, and Figure 2 herein shows the locations of historical samples. Following the completion of the Fall 2004 emergency response activities, a soil and groundwater investigation was performed in November and December 2004.

2004 Soil and Groundwater Investigation: Between November 30 and December 3, 2004, Cambria installed eight soil borings (SB-1 through SB-8) at the site for the collection of soil and groundwater samples to further assess the impacts of the August 2004 product loss event. The borings were augered to approximately 15 fbg. Soil samples were collected from each boring at 5 fbg and at 6 .5 fbg (capillary fringe). Grab groundwater samples were collected from shallow groundwater from each boring at approximately 6.5 to 8.0 fbg. Discrete (hydropunch-type) groundwater samples were also collected from the deeper groundwater as follows: From 10 fbg in only one boring, SB-1, and from 15 fbg in all borings except SB-3, which did not provide recharge for sampling at that interval.

The maximum concentrations in soil were 740 ppm of TPHg in SB-8-6.5', 1.5 ppm of MTBE in SB-4-6.5', and 53 ppm of ethanol in SB-8-6.5'. All of the other constituents were below the laboratory detection limits in soil. The maximum concentrations in the grab groundwater samples were 17,000 ppb of TPHg and 250 ppb of benzene in SB-8-W, 9,000 ppb of MTBE in SB-3-W, and 1,100 ppb of TBA in SB-4-W. None of the other constituents were reported from the grab groundwater samples. The maximum concentrations in the discrete groundwater samples were 920 ppb of TPHg in SB-7W-15', 5.3 ppb of benzene in SB-8W-15', 300 ppb of MTBE in SB-1W-10', 2,000 ppb TBA in SB-4W-15', and 4.0 ppb TAME in SB-4W-15'. None of the other fuel oxygenates or ethanol were detected in any of the discrete groundwater samples from 10 or 15 fbg.

These results were reported in Cambria's February 18, 2005 *Soil and Groundwater Investigation Report* along with specific recommendations for additional investigation. The ACHCSA concurred with the recommendations and made additional requests in their May 13, 2005 correspondence. The work plan for these activities is provided below.

TECHNICAL RATIONALE FOR PROPOSED SCOPE OF WORK

Based in part on Cambria's recommendations in the above-referenced February 18, 2005 document, and on the technical comments and requests in the ACHCSA May 13, 2005 correspondence, Cambria presents the following proposed scope of work to (1) evaluate the potential for subsurface utilities to be acting as preferential pathways, (2) assess the vertical and lateral extent of petroleum constituents on and offsite, (3) assess and monitor groundwater gradient and concentration trends, and (4) continue to perform remedial efforts related to the release:

- To assess the potential for the subsurface utilities to be acting as preferential pathways for contaminant migration, a detailed cross section will be prepared demonstrating the depth and diameter of utility conduits, site lithology, and groundwater elevation data.
- To assess the vertical and lateral extent of impact observed onsite, and in particular at 15 fbg in SB-1, Cambria proposes advancing direct-push borings (SB-9 through SB-16, **Figure 3**) to 40 fbg for the collection of additional soil and groundwater data.
- To confirm groundwater conditions and obtain groundwater gradient data beneath the site, groundwater monitoring wells with relatively short screened intervals that intercept first encountered groundwater are proposed to be installed onsite (S-2 through S-7, **Figure 3**) and monitored over time. Cambria will schedule the events to be concurrent with the monitoring of wells at the former 76 Service Station located north of the site. Cambria had previously proposed installing one deeper well near boring SB-1. **This work plan does not propose the installation of any deeper wells at this time because the information we will obtain from the vertical and lateral investigation activities will allow us to better locate and design any deeper monitoring wells. Installation of deeper wells will be proposed in the technical report of findings from this work.**
- Continuing monthly groundwater extraction (GWE) from, and sampling of, tank backfill well TBW-N until the stability of constituent concentrations in the UST pit is verified, and/or until groundwater conditions have been evaluated through sampling of onsite wells.

WORK TASKS

Utility Cross Section: To assess the potential for the subsurface utilities on and near the site to be intercepting the groundwater and thereby acting as preferential pathways for contaminant migration, a detailed cross section will be prepared demonstrating the depth and diameter of utility conduits, site lithology, and groundwater elevation data. Following completion of the utility cross section, preliminary screening of the accessible manholes or vaults for the utilities that intercept groundwater will be performed using a photo-ionization detector (PID). Following completion of these activities and the proposed investigation work, Cambria will evaluate whether more aggressive investigation of the utilities is warranted. With respect to the sanitary sewer line depicted on the utility map as crossing the UST pit, Cambria has confirmed through photographs that the sewer line is located above the USTs, and therefore is not a preferential pathway for groundwater migration.

Permits: Cambria will obtain appropriate permits for drilling and encroachment from the Alameda County Public Works Department (ACPWD), and will request access from the adjacent property owner (in progress).

Site Safety Plan: Cambria will prepare a Site Safety Plan for the field work, including a traffic control plan.

Utility Clearance: Cambria will review the "As-Built" drawings previously received from Shell prior to field work. Cambria will mark proposed drilling locations and will clear the boring locations through Underground Service Alert (USA) prior to drilling. Although we have obtained a significant amount of information relating to the presence and location of utilities in the area, a private utility line-locating service will also be retained to further clear each proposed boring location prior to any intrusive work. For safety purposes, using an air-knife or a hand auger, the first five feet of each boring will be cleared to a diameter of 3-inches larger than the lead auger to minimize potential damage to underground structures not identified through the above-listed efforts. Traffic control measures will be required for the utility line-locator service and for clearing the top five-feet any locations within or near Webster Street.

Site Investigation – Vertical and Lateral Assessment: Eight soil borings (SB-9 through SB-16) are proposed at the approximate locations shown on Figure 3. These borings will be installed using a cone penetration test (CPT) rig. Following clearance of the first five feet as described above, each boring will be extended to a total depth of 40 fbg to log lithology using the electronic CPT technology. Since groundwater is expected to be encountered at approximately 6

to 7 fbg, only one soil sample will be collected from between 5-6.5 fbg in the unsaturated zone, to further assess the lateral extent of impact in near-surface soils. Groundwater samples will be collected from first encountered groundwater using a bailer. For vertical assessment, a hydropunch sampler (or similar technology) will be used to obtain depth-discrete groundwater samples from approximately 15 fbg, 25 fbg, and 35 fbg. The targeted sample intervals may be adjusted based on the soil types identified by the electronic CPT log.

A Cambria geologist will supervise the drilling, and encountered soils will be continuously logged using electronic CPT technology. Soil samples will be retained in brass or stainless steel sample tubes and will be covered on both ends with Teflon sheets and plastic end caps. Groundwater samples collected by a bailer or with CPT groundwater sampling equipment will be 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 of California certified laboratory for analyses.

Site Investigation – Monitoring Well Installations: Six soil borings (S-2 through S-7) are proposed at the locations shown on Figure 3. These borings will be drilled using hollow-stem auger (HSA) equipment and will be converted into groundwater monitoring wells (S-2 through S-7). After clearing the first five feet at each location as described above, the borings will extend to 12 fbg for well installation. Each well will be installed to screen the first-encountered shallow groundwater at the site, which is expected to be encountered between 6- and 7-fbg. Although a 5-foot screen interval is preferred by ACHCSA, Cambria recommends that these shallow groundwater monitoring wells be installed with screens extending from 4 fbg to 12 fbg to allow for seasonal fluctuations of the water table. Historical depth to water measurements from wells MW-1 through MW-3, and S-1, and also recent data from TBW-N indicate that the shallow groundwater at this site fluctuates between 3.5 to 10 fbg.

A Cambria geologist will supervise the drilling and describe encountered soils in the borings using the Unified Soil Classification System and Munsell Soil Color Charts. Soil samples will be collected continuously from 5 feet below grade (fbg) to the bottom of the boring for lithologic description. Soil samples will be screened in the field for organic vapors using a photo-ionization detector (PID). Exploratory boring logs will be prepared for each boring. PID measurements will be recorded on the boring logs.

Unsaturated soil samples designated for chemical analyses will be retained in steel, brass, or plastic tubes from between 5 to 6.5-fbg. The tubes will be covered on both ends with Teflon sheets and plastic end caps, labeled, entered onto a chain-of-custody record, and placed into a

cooler with ice for transport to a State of California certified laboratory for analysis. A standard two week turn-around time will be requested for laboratory results.

Each well will be constructed using 4-inch diameter Schedule 40 PVC casing. Because the lithology is known to be predominantly poorly graded sands and sands with silt, Cambria recommends using a screen slot size of 0.020 and a #2/12 filter pack, or similar. Because the well screens will extend up to 4 fbg, the sandpack in each well will be placed from the bottom of the well screen up to a maximum 1-foot above the top of the well screen followed by a 1 to 1.5-foot thick bentonite seal and cement grout to grade. Actual well construction details may be modified based on field conditions encountered during drilling. Each well will be secured with a locking cap under a traffic-rated well box.

Well Development and Sampling: Following at least 24-hours after installation, Blaine Tech Services, Inc. (Blaine) of San Jose, California will develop wells S-2 through S-7 prior to sampling. No sooner than 48-hours after well development, Blaine will sample the wells according to the existing sampling schedule, and will submit the samples to a State of California certified laboratory for chemical analyses.

Chemical Analyses: Based on the results of previous samples, the groundwater and selected soil samples will be analyzed for TPHg, BTEX, and the five oxygenates (MTBE, TBA, DIPE, ETBE and TAME) by EPA Method 8260B. Following an evaluation of the initial analytical results, a modification of the analytical suite may be proposed. In addition, during the first sample event, groundwater samples from the monitoring wells will also be analyzed for total dissolved solids.

Wellhead Survey Activities: Following monitoring well installation, a licensed surveyor will survey wellhead elevations of all new wells and the existing tank backfill wells to a common datum relative to mean sea level as well as the latitude and longitude of each well location. The information will be uploaded into the State of California Geo-Tracker database, as required.

Quarterly Monitoring Program: The six new wells on the site will be gauged and monitored on a quarterly basis, in conjunction with the existing wells at the former 76 Station 0843, located just north (and down gradient) at 1629 Webster Street.

Report Preparation: Following the receipt of analytical results from the laboratory, Cambria will prepare a written report which will include a description of the field procedures, a presentation of the analytical results, tabulated data, figures showing sample locations, the complete analytical laboratory reports, boring logs with well construction details, findings and conclusions.

Groundwater Extraction: Groundwater extraction and groundwater sampling of tank backfill well TBW-N will continue to be conducted monthly, while the stability of the chemical concentrations in the UST pit is verified, and until the chemical concentration sample results from the new wells have been reviewed to sufficiently evaluate groundwater conditions at the site. The results of the groundwater extraction and sampling of well TBW-N will be reported along with the quarterly monitoring reports that will be submitted for the site.

CERTIFICATION

The scope of work described in this work plan will be performed under the supervision of a California professional geologist or engineer.

SCHEDULE

Cambria has initiated the access and encroachment permitting activities, and will schedule this work upon approval of this work plan by ACHCSA and receipt of approved drilling permit(s), encroachment permit(s), and an executed access agreement. At a minimum, the onsite monitoring wells can be scheduled as soon as approval of the work plan is received, based on drill rig availability.

Cambria anticipates submitting the technical report of findings 60-days following receipt of the analytical results from the groundwater monitoring wells. Cambria will update ACHCSA as activities are scheduled.

CLOSING

If you have any questions regarding the scope of work outlined in this work plan, please call Ana Friel at (707) 268-3812.

Sincerely,
Cambria Environmental Technology, Inc.

for

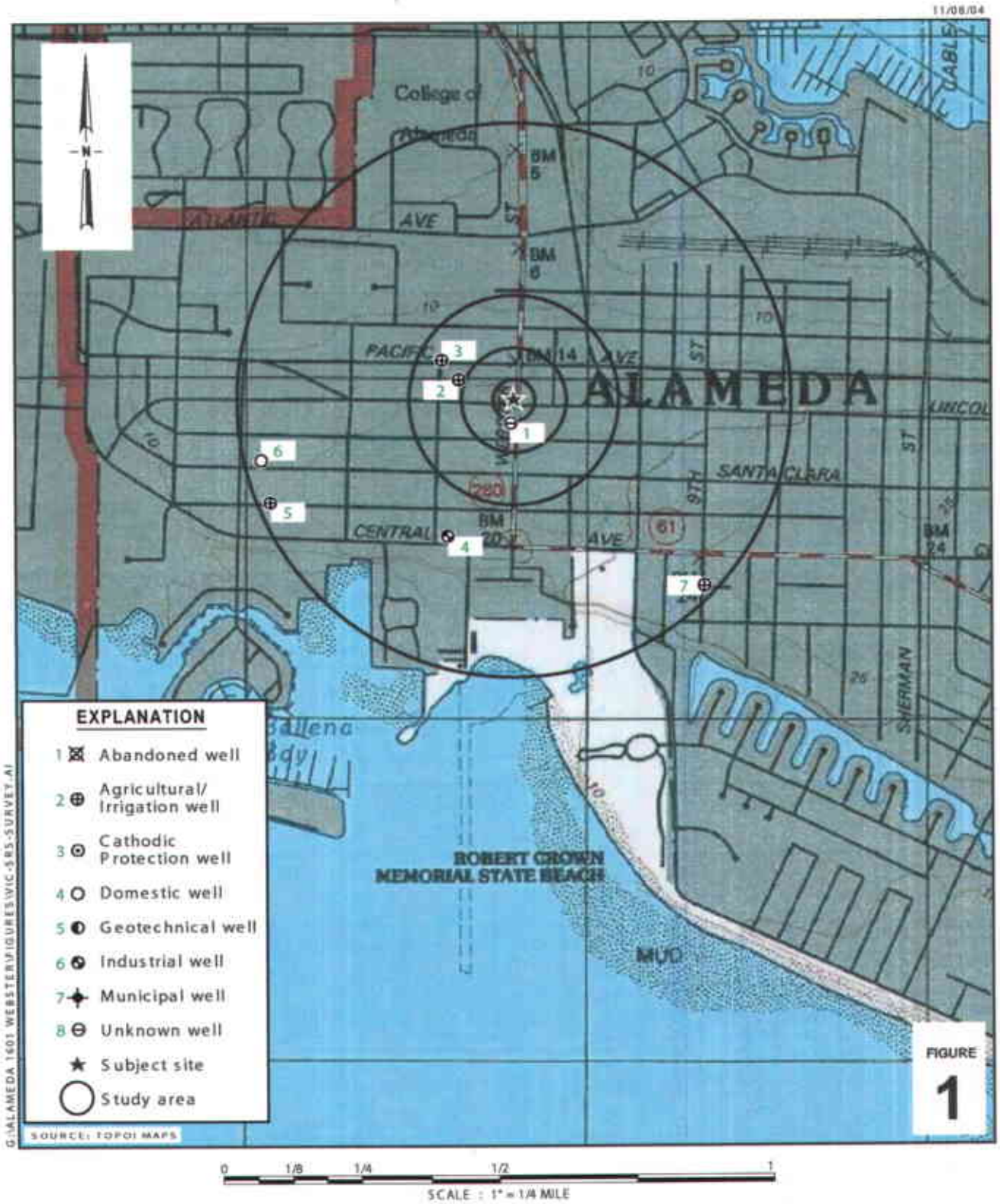
Ana Friel
Senior Project Geologist
PG 6452

Attachments

Figure 1. Vicinity/Sensitive Receptor Survey Map
Figure 2. Site Plan/Historical Sample Location Map
Figure 3. Proposed Boring/Well Locations

Appendix A. Summary: Site Background and Previous Investigations/Activities

cc: Mr. Denis Brown, Shell Oil Products US
Mr. Thomas H. Kosel, ConocoPhillips Risk Management & Remediation, 76 Broadway, Sacramento, CA 95818
Mr. James C. Kirschner, ATC Associates, Inc., 6602 Owens Drive, Suite 100, Pleasanton, CA 94588 (consultant for ConocoPhillips)



Shell-branded Service Station
1601 Webster Street
Alameda, California
Incident #97437680

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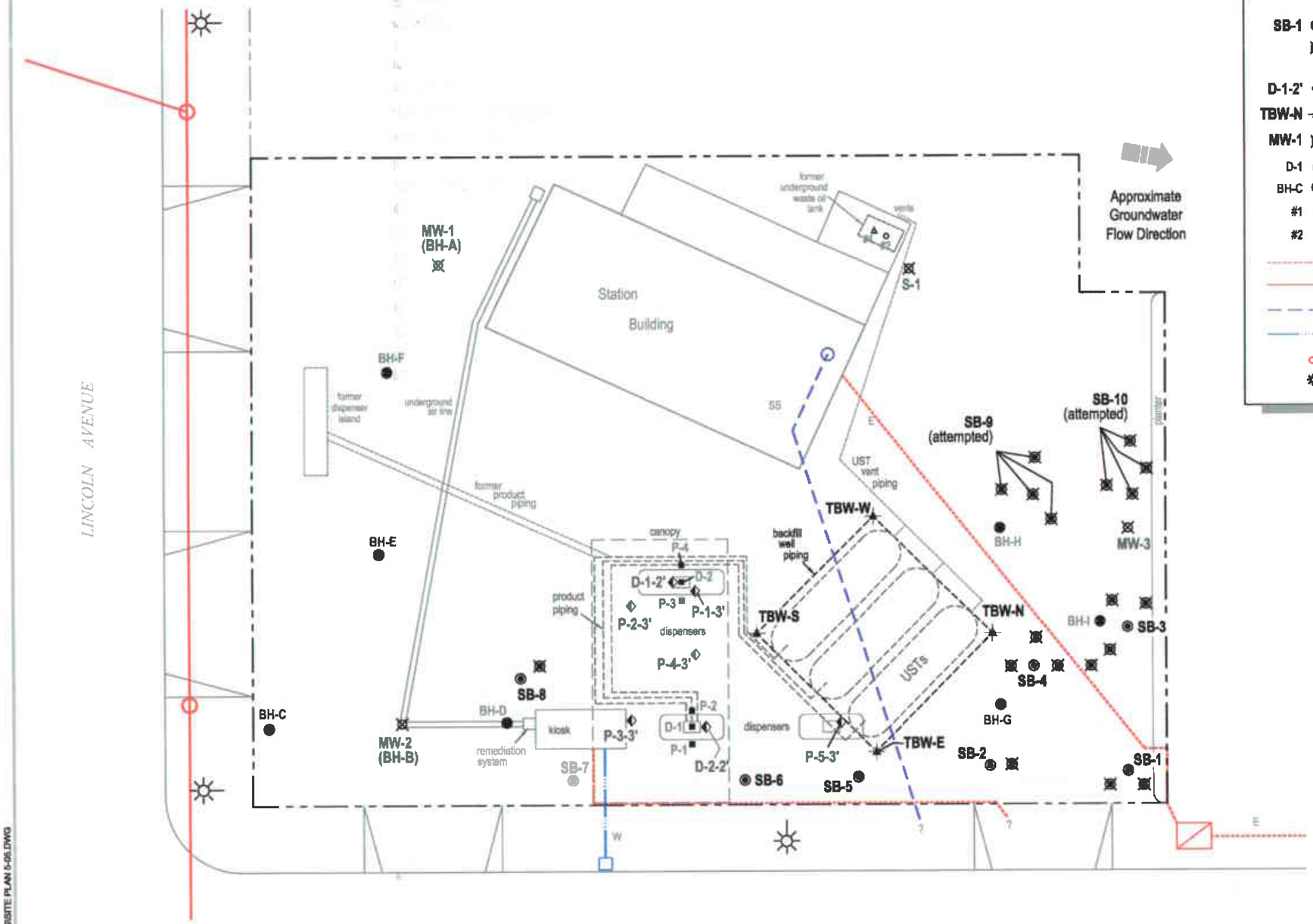
Vicinity/Sensitive Receptor Survey Map
(200, 500, and 1,000 Ft., and1/2 Mile Radii)

05/10/05

Site Plan/Historical Sample Location Map

EXPLANATION

- SB-1 ● Soil boring location (11/30/04, 12/1-2/04)
- ⊠ Attempted soil boring location (11/30,12/1-2/04), not completed due to refusal
- D-1-2' ◇ Soil sample location (8/10/04)
- TBW-N ✳ Tank backfill well location
- MW-1 ⊠ Destroyed monitoring well location
- D-1 ■ Soil sample location (WA, 1997)
- BH-C ● Soil boring location (WA, 10/92)
- #1 △ Soil sample location (Blaine, 6/87)
- #2 ○ Grab water sample location (Blaine, 6/87)
- Electrical line (E)
- Overhead electrical line (OE)
- Sanitary sewer line (SS)
- Water line (W)
- Power pole
- Street light



0 10 20 40

Scale (ft)

FIGURE

2

Shell-branded Service Station

1601 Webster Street
Alameda, California
Incident No.97564701

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G:\ALAMEDA 1601 WEBSTER\FIGURES\SITE PLAN 5-05.DWG

07/01/05

EXPLANATION

- SB-9 — Proposed soil boring location
- S-2 — Proposed shallow monitoring well location
- MW-1 — Destroyed monitoring well location
- TBW-N — Tank backfill well location
- MW-1 — Monitoring well location (former Tosco)
- Electrical line (E)
- Overhead electrical line (OE)
- Storm drain line (SD)
- Sanitary sewer line (SS)
- Water line (W)
- Gas line (G)
- Telecommunications line (T)
- Storm drain inlet
- Flow direction
- Manhole
- Power pole
- Street light

Approximate Groundwater Flow Direction

637 Lincoln
639 Lincoln
643 Lincoln
642-644 Pacific
643 Pacific
1701 Webster
1600-1604 Webster
1606-1614 Webster
1615-1615 1/2 Webster

LINCOLN AVENUE
PACIFIC AVENUE
WEBSTER STREET

Shell Service Station
(1601 Webster)

Former 76 Service Station # 0843
(1629 Webster)

Building
Former W/O UST
Former USTs
Former Dispenser
Former dispenser island
former underground waste oil tank
former product piping
underground air line
dispenser
kiosk
USTs

MW-1 MW-2 MW-3 MW-4 MW-6
S-1 S-2 S-3 S-4 S-5 S-6 S-7
TBW-W TBW-S TBW-N TBW-E
SB-9 SB-10 SB-11 SB-12 SB-13 SB-14 SB-15 SB-16

W (6"Ø)
W (2"Ø)
OE
SS (8"Ø)
SD (18"Ø RCP)
W (20"Ø)
W (24"Ø)
W (12"Ø)
G
E
inlet = 11.20'
FL = 7.70'
inlet = 10.80'
FL = 7.60'
rim = 11.70'
FL = 2.86'
FL = 4.32'

0 15 30 60
Scale (ft)

FIGURE
3

Proposed Boring/ Well Locations

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Shell-branded Service Station
1601 Webster Avenue
Alameda, California
Incident No.97564701

G:\ALAMEDA 1601 WEBSTER\FIGURES\PHOP_BORS 8-05.DWG

APPENDIX A
SUMMARY: Site Background & Previous Investigations/Activities
Shell-branded Service Station
1601 Webster Street, Alameda, California

SITE BACKGROUND

Site Conditions

Site Location and Topography: The site is located at the northwest corner of Webster Street and Lincoln Avenue in Alameda, California in a mixed commercial and residential area (Figures 1 and 2). The site is located approximately ½ mile from the San Francisco Bay. The site's address is known to Shell as 1601 Webster Street; however, the Alameda County Assessor's office lists the property address as 1607 Webster Street. Local topography is flat, and the site's elevation is approximately 13 ft above mean sea level.

Property Owner: As requested in the ACHCSA's September 3, 2004 *Notice of Responsibility* letter the current fee title owner of the referenced property is identified on behalf of Shell in compliance with section 25297.15(a) of Chapter 6.7 of the Health Safety Code. The property owner is Shell (Equilon Enterprises LLC). Shell's address for tax purposes is P.O. Box 4369, Houston, TX 77210. Shell's address for environmental correspondence is: Denis Brown, Shell Oil Products US, 20945 South Wilmington Avenue, Carson, California 90810.

Nearby Leaking Underground Fuel Tank (LUFT) Sites: According to the Geotracker database, several LUFT sites are present in the area near the site. These include:

- Former 76 Service Station 0843 at 1629 Webster Street, north of the site. According to the Geotracker database, this case is currently open due to a gasoline release, and is located downgradient of the subject Shell site.
- BP Oil Service Station #11104 at 1716 Webster Street, northeast of the site. Open case, gasoline, downgradient of the site.
- Chevron station at 1802 Webster Street, northeast of the site. Open case, gasoline, downgradient of the site.
- Devon Home Center, 1701 Webster Street, south of the site. Case closed on March 9, 1996, gasoline release, upgradient of the site.
- Ogden Service Corporation, 1700 Webster Street, southeast of the site. Case closed on June 24, 1992, waste oil/used oil release, upgradient of the site.
- Pacific Properties, 1628 Webster Street, southeast of the site. Case closed on August 28, 1996, gasoline release, upgradient of the site.
- Jiffy Lube, 1435 Webster Street, south of the site. Open case, upgradient of the site.

- Bank of America, 1528 Webster Street, south of the site. Case closed January 6, 1997, diesel release.
- Alameda Fire Station #2, 635 Pacific Avenue, north-northwest of the site. Case closed February 28, 1994, gasoline release.

Subsurface Geology: Boring logs from previous site investigations at the site and the adjacent former 76 site indicate that the site is underlain by sand and silty sands to 21.5 feet below ground (fbg). Some prior reports identified the sediments as the Merritt Sand, an unconsolidated Pleistocene beach and near shore deposit. Review of the boring logs shows consistent poorly sorted sand to silty sand in the shallow water bearing zone. A cross-section is not required to observe the relative homogeneity of the shallow water-bearing sediments.

Groundwater Depth: The historical depth to groundwater has previously ranged from approximately 4.5 fbg to 10.5 fbg. During August 2004 upgrade activities and emergency response actions, the depth to water in the tank backfill wells was measured at approximately 6 fbg before pumping of the wells.

Groundwater Flow Direction: Based on previous groundwater monitoring data at the site and the adjacent former 76 site, groundwater generally flows northerly to northeasterly. Review of the groundwater elevation contour maps indicates a consistent north to northeastern groundwater gradient.

PREVIOUS SITE INVESTIGATIONS AND ACTIVITIES

1987 Waste Oil Tank Removal: In June 1987, a 550-gallon underground waste oil tank that was originally installed in 1962 was removed from the site. Blaine Tech Services (Blaine) of San Jose, California reported that the tank contained more than 77 holes and that hydrocarbon sheen was observed on the water in the excavation. Soil samples from 9.5 fbg in the excavation contained 133 parts per million (ppm) petroleum oil and grease (POG), 14 ppm total petroleum hydrocarbons (TPH), and 29 ppm 1,1,1-trichloroethane (TCA). A grab water sample collected from the water surface at about 12.5 fbg contained 244 ppm POG, 132 ppm TPH, 11 ppm TCA, and 59 ppm methyl chloride. These results were reported in Blaine's July 16, 1987 *Field Sampling at Shell Station* letter report, and Blaine's June 26, 1989 letter report summarizing previously unpublished notes.

1987 Well S-1 Installation: In September 1987, Pacific Environmental Group (PEG) of Santa Clara, California drilled one soil boring and installed groundwater monitoring well S-1 immediately down gradient of the former waste oil tank to assess whether hydrocarbons detected during the excavation were in groundwater (Figure 2). TOG was detected in the boring from 3.5 and 15.5 fbg at a maximum concentration of 130 ppm at about 5 fbg. TPH as gasoline (TPHg) was detected at 50 ppm in soil at about 4 fbg. No halogenated volatile organic compounds

(HVOCs) were detected in soil or groundwater. These results were reported in PEG's October 23, 1987 letter report.

1990 Well MW-1 and MW-2 Installation: In April 1990, Weiss Associates (WA) installed wells MW-1 and MW-2 (Figure 2). TPHg was detected at a maximum concentration in soils of 32 ppm in the boring for well MW-2, with the highest concentration detected below the water table. Unsaturated soil samples from the two borings contained less than 0.1 ppm benzene, ethylbenzene, toluene, and/or xylenes (BTEX). No POG or HVOCs were detected in soil from either boring. These results were reported in WA's July 6, 1990 *Subsurface Investigation at Shell Service Station* report.

1992-1993 Subsurface Investigation: On October 12 and 22, 1992 and February 19, 1993, WA installed eight soil borings, BH-C through BH-J, ranging from 12.5 to 21.5 fbg, and one monitoring well, MW-3 (Figure 2). TPHg was detected at a maximum concentration in soil of 170 ppm from 10.5 fbg in boring BH-E. Benzene was detected at a maximum concentration in soil of 0.11 ppm from boring BH-E at 13.5 fbg. Grab groundwater samples from each boring resulted in a maximum TPHg concentration of 26,000 parts per billion (ppb), and a maximum benzene concentration of 6,900 ppb. These results were reported in WA's April 16, 1993 *Subsurface Investigation Report.*

1997 Pipeline and Dispenser Upgrades: On August 27, 1997, Cambria conducted soil sampling under the product piping and below dispenser locations on-site at approximately 5 fbg (Figure 2). The highest concentrations in soil were found in sample D-2 at a depth of 5 fbg with 11,000 ppm TPHg, 6.3 ppm benzene, 7.8 ppm toluene, 96 ppm ethylbenzene and 440 ppm total xylenes. TPHg concentrations for the same location at a depth of 10-fbg decreased to 760 ppm. No MTBE was detected in the analytical samples. Cambria's October 8, 1997 *Pipeline and Dispenser Soil Sampling Report* presented the results.

1998 Waste Oil Remote Fill Pipe Removal: Paradiso Mechanical Inc., of San Leandro, California upgraded the site's waste oil system and removed the remote fill pipe associated with the waste oil tank. Cambria confirmed with ACHCSA regulator Rob Weston prior to the upgrade that no samples would be required as the pipeline was pressurized at above 20 psi and tested overnight, therefore requiring no sample to be taken. Cambria's December 1, 1998 *1998 Upgrade Site Inspection Report* presented the findings.

Prior Groundwater Monitoring: Groundwater was monitored and sampled generally quarterly prior to the destruction of the on-site monitoring wells in 1999 and subsequent case closure. Following initial sampling of well S-1 in September 1987, groundwater was monitored consistently between September 1989 and April 1998. During that time, the groundwater

gradient near the USTs was consistently north-easterly, ranging between north-northwest and northeast. Depth to water has ranged between approximately 4.5 and 10.5 fbg at the site.

Prior Groundwater Remediation: Groundwater remediation by oxygenation was implemented by using an air compressor to inject air into MW-2 from March 2, 1995 until March 18, 1996.

1999 Monitoring Well Abandonment and Case Closure: On January 15, 1999, Cambria oversaw the destruction of all four on-site monitoring wells to facilitate case closure with the ACHCSA. Cambria's February 26, 1999 *Monitoring Well Abandonment Report* documented the work. ACHCSA's March 15, 1999 *Remedial Action Completion Certification and Fuel Leak Site Case Closure* letters confirmed completion of site investigation and remedial action and granted UST case closure for the site. The case closure letter also documented that up to 100 ppm TPHg and 0.026 ppm benzene existed in soil, and up to 3,800 ppb TPHg and 190 ppb benzene existed in groundwater at the time of case closure.

March 2004 Well Survey: At Shell's request, Cambria performed a search of California Department of Water Resources (DWR) records for water producing wells within one-half mile of the site. Monitor, cathodic, test, abandoned or destroyed wells were not researched. No public water supply (PWS) wells were identified from DWR records or from the Geotracker database. Records of seven non-PWS wells were found. The approximate well locations are depicted on Figure 1.

The nearest identified well was located by address approximately 150 ft south of the site. The DWR well record was undated, and did not record the well's intended use. Cambria's site inspection indicated that the address is currently occupied by a café, and the visit did not indicate the presence of a well; therefore the well is presumed to be abandoned. The next closest wells, irrigation wells installed in 1977, are estimated to be about 525 and 800 feet northwest of the site, and drilled to 25 and 32 fbg, respectively. Since groundwater is known to flow generally northward, these wells are cross-gradient of the site, and are therefore unlikely to be affected by impacted groundwater from the site. All other identified wells are located more than 1,000 feet to the southeast, south, and southwest (upgradient) of the site and therefore would not likely be affected by impacted groundwater from the site.

August 2004 Fuel System Upgrades: S.J. Weaver Contracting, Inc. of Signal Hill, California upgraded the station's fuel dispensers, piping, and vapor recovery system during August 2004. Due to the high water table, groundwater from the UST excavation was pumped into a storage tank periodically, and was off-hauled as non-hazardous waste to Shell's Martinez refinery for disposal. Cambria collected soil samples beneath removed dispensers and piping on August 10, 2004. No benzene or MTBE was detected in any soil samples collected during these

activities. TPHg was detected in one soil sample and xylenes were detected in two soil samples from beneath fuel piping. The soil analytical results indicated that the highest residual hydrocarbon concentrations were located near the northwest corner of the kiosk building at sample location P-3-3'. Due to the reported presence of TPHg and xylenes in soil, Shell filed an August 11, 2004 **Unauthorized Release Report Form** with ACHCSA.

Following re-installation of one fuel pump into one 10,000 gallon UST, S.J. Weaver identified a product loss in one 10,000-gallon UST by manual tank gauging. S.J. Weaver personnel pumped water from the tank excavation into an open-top storage tank on-site. As fuel had leaked out of the damaged UST, the pumped water contained free product. The resulting gasoline vapor concentrations warranted site evacuation, cessation of work, and emergency response. As a result, Shell's contractors conducted emergency response and remediation beginning on August 19, 2004. On August 19, 2004, the remaining fuel in the damaged UST was removed by a tanker truck, and groundwater pumping from one of the tank backfill wells was initiated. Cambria oversaw emergency response efforts including on-going groundwater extraction from an on-site tank backfill well to recover product lost during the release. The product loss, emergency response activities, and emergency remediation efforts associated with this event are presented in further detail in Cambria's November 30, 2004 *Soil & Groundwater Investigation Work Plan and Agency Response*. As a result of the product loss, Shell filed an August 19, 2004 **Unauthorized Release Report Form** with ACHCSA. In addition, the Alameda Fire Department filed a report with the California Governor's Office of Emergency Services. ACHCSA subsequently opened a new environmental case for the site on September 3, 2004.

August 2004 - Groundwater Extraction (GWE): Following the August 2004 product release at the site, Cambria supervised Philip Services Corporation's (PSC) groundwater extraction (GWE) from the northern-most tank backfill well (TBW-N). Initially, groundwater was extracted several times per day from August 19 until August 23, 2004. Then, daily GWE was conducted from August 24 until September 10, 2004. From September 13 through November 16, GWE was conducted weekly. Cambria gauged product thickness in well TBW-N, and estimated product recovery by measurement of product thickness in the tanker truck while separate phase hydrocarbons (SPH) were present. Cambria periodically collected grab groundwater samples from TBW-N for analysis for TPHg, BTEX, and MTBE. On November 1, 2004, Cambria switched the GWE contractor to Onyx Industrial Services. Beginning with the November 8, 2004 sample, all samples are also analyzed for four additional oxygenate compounds DIPE, TAME, TBA, and ETBE, EDB, 1, 2-DCA and ethanol. The sample analytical results and evaluation, and details regarding product removal and groundwater extraction are also presented in Cambria's November 30, 2004 *Soil & Groundwater Investigation Work Plan and Agency Response*. As of May 2005, monthly GWE was still ongoing.

November 2004 Soil and Groundwater Investigation: Between November 30 and December 3, 2004, Cambria installed eight soil borings (SB-1 through SB-8) at the site for the collection of soil and groundwater samples to further assess the impacts of the August 2004 product loss event. The borings were augered to approximately 15 fbg. Soil samples were collected from each boring at 5 fbg and at 6 .5 fbg (capillary fringe). Grab groundwater samples were collected from shallow groundwater from each boring at between 6.5 to 8.0 fbg. Discrete (hydropunch-type) groundwater samples were also collected from the deeper groundwater as follows: At 10 fbg in only one boring, SB-1, and at 15 fbg from all borings except SB-3, which did not produce any deeper groundwater samples.

The maximum concentrations in soil were 740 ppm of TPHg in SB-8-6.5', 1.5 ppm of MTBE in SB-4-6.5', and 53 ppm of ethanol in SB-8-6.5'. All of the other constituents were below the laboratory detection limits in soil.

The maximum concentrations in the grab groundwater samples were 17,000 ppb of TPHg and 250 ppb of benzene in SB-8-W, 9,000 ppb of MTBE in SB-3-W, and 1,100 ppb of TBA in SB-4-W. None of the other constituents were reported from the grab groundwater samples.

The maximum concentrations in the discrete groundwater samples were 920 ppb of TPHg in SB-7W-15', 5.3 ppb of benzene in SB-8W-15', 300 ppb of MTBE in SB-1W-10', 2,000 ppb TBA in SB-4W-15', and 4.0 ppb TAME in SB-4W-15'. None of the other fuel oxygenates or ethanol were detected in any of the discrete groundwater samples from 10 or 15 fbg.

These results were reported in Cambria's February 18, 2005 *Soil and Groundwater Investigation Report.*