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CAMBRIA

AUG 10 2001

August 8, 2001

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: **Additional Subsurface Investigation Work Plan**
Former Shell Service Station
1230 14th Street
Oakland, California
Incident #: 97088250
Cambria Project #: 243-0233

Dear Mr. Chan,

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Subsurface Investigation Work Plan* on behalf of Equiva Services LLC. The work plan was prepared in response to the Alameda County Health Care Services Agency's (ACHCSA) letter dated July 13, 2001, which requested additional characterization of the tank pit area as well as the installation of downgradient monitoring wells. The objective of this project is to further define the lateral extent of the dissolved gasoline plume downgradient of the site, to assess the extent of residual hydrocarbons in the former underground storage tank (UST) area, and to provide data for further study of plume attenuation and stability. Our proposed scope of work is presented below.

PROPOSED SCOPE OF WORK

Putting wells in prior locations will not determine extent of plume. Hottest soil samples were @ GW (~15') ; put well w/ former pit for remediation.

Cambria proposes to install three new two-inch-diameter monitoring wells (MW-5, MW-6 and MW-7) to a depth of approximately 20 feet below grade (fbg) in the locations shown on Figure 1. To prevent inconvenience to neighboring residential property owners and occupants, dis'agree the new wells will be installed within the site property limits. One well will be installed near the northern boundary of the property in the vicinity of soil boring GP-3, which exhibited elevated concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene during Cambria's December 2000 investigation. Another well will be installed in the extreme northeast corner of the site in the prevailing downgradient direction. A third well will be installed along the eastern boundary of the site, near soil boring GP-1, which also exhibited elevated concentrations of TPHg and benzene during the previous investigation.

Oakland, CA
San Ramon, CA
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Cambria also proposes to collect a groundwater sample from within the former UST excavation area to assess the residual hydrocarbon impact in that area. The proposed sample location is shown in Figure 1.

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

Utility Location: Cambria will notify Underground Service Alert (USA) of our proposed drilling activities. USA will have the utilities in the vicinity identified.

Site Health and Safety Plan: Pursuant to OSHA requirements, Cambria will prepare a comprehensive site safety plan to protect site workers. The plan will be kept onsite during field activities and will be reviewed and signed by each site worker.

Permits: Cambria will obtain necessary permits from the City of Oakland and the Alameda County Public Works Agency.

Well Installation and Sampling Activities: Using a hollow-stem-auger drill rig, Cambria will install three two-inch diameter groundwater monitoring wells to an approximate depth of 20 fbg. Based on depth to water measurements in site wells since 1996, Cambria plans to screen the wells from 5 to 20 fbg. Well construction will be completed as described in our "Standard Field Procedures for Monitoring Well Installation," which are included as Attachment A. Given the recent sampling in the proposed well locations, no soil or groundwater samples will be submitted for analysis. However soil samples will be collected below 10 fbg for stratigraphic logging purposes.

Well Development and Top of Casing Survey: Blaine Tech Services, Inc. of San Jose, California will develop and sample the new monitoring wells. Well sampling will coincide with periodic sampling of the other site wells, and sampling results will be reported in the subsequent quarterly groundwater monitoring report. Virgil Chavez Land Surveying of Vallejo, California will survey the top of casing elevation relative to mean sea level.

Groundwater Sampling in Tank Pit Area: Using a hollow-stem-auger drill rig, Cambria will advance one boring in the former UST excavation area to the depth of groundwater and collect a grab-groundwater sample.

Laboratory Analyses: The grab-groundwater sample will be analyzed by a State-certified laboratory for total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, xylenes and methyl tert butyl ether by EPA Method 8260.

CLOSING

Please call Melody Munz at (510) 420-3324 if you have any questions or comments. Thank you for your assistance with this project.

Sincerely,
Cambria Environmental Technology, Inc.

Melody Munz
Project Engineer

Stephan A. Bork, C.E.G., C.HG.
Associate Hydrogeologist

REGISTERED GEOLOGIST
STEPHAN A. BORK
No. EG 2058
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

Figure: 1 - Proposed Monitoring Well Location Map

Attachment: A - Standard Field Procedures for Monitoring Well Installation

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Tom Saberi, 1045 Airport Boulevard, Suite 12, South San Francisco, CA 94080
Matthew Dudley, Sedgwick, Detert, Moran, & Arnold, 1 Embarcadero Center, 16th Floor, San Francisco, CA 94111-3628

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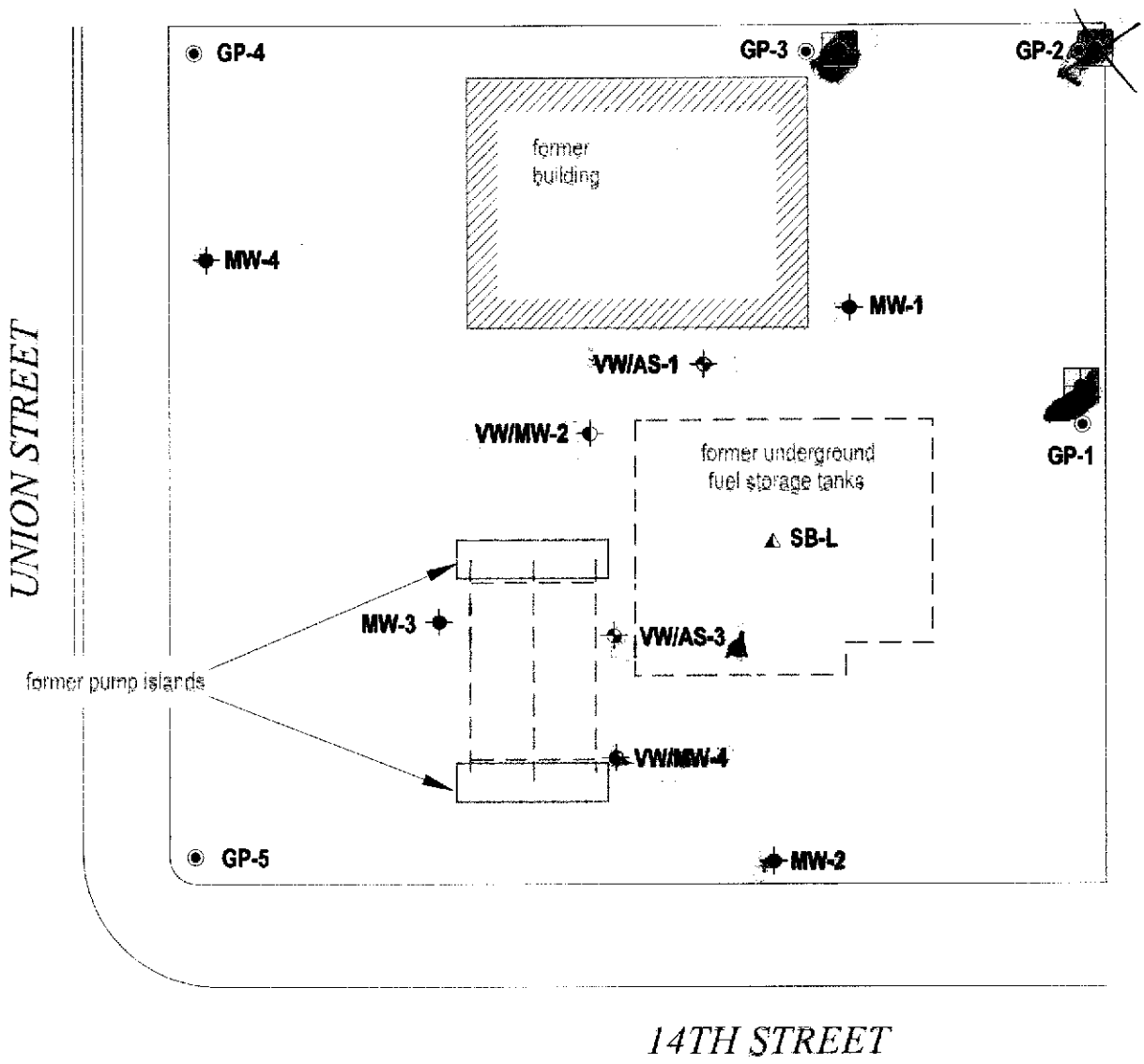

EXPLANATION

- SB-L ▲ Proposed groundwater sample location
- MW-1 ⊕ Monitoring well location
- VW/AS-1 ⊕ Combination air sparge/soil vapor extraction well
- VW/MW-2 ⊕ Combination soil vapor extraction well/monitoring well
- GP-1 ◉ Soil boring location (12/11/00)

N

0 10 20

Scale (ft)

FIGURE 1

G:\OAKLAND\1230-14TH\FIGURES\PROP-WELL.DWG

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Proposed Monitoring Well Location Map

ATTACHMENT A

Standard Field Procedures for Monitoring Well Installation

STANDARD FIELD PROCEDURES FOR MONITORING WELL INSTALLATION

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

Well Construction and Surveying

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

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

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

Well Development

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

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

Groundwater Sampling

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