



Mr. Barney Chan  
Alameda County Health Care Service Agency (ACHCSA)  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

Re: **Revised Investigation Workplan**  
Former Chevron Service Station # 9-0517  
3900 Piedmont Avenue  
Oakland, California

Dear Mr. Chan:



On behalf of Chevron Environmental Management Company (Chevron), Cambria Environmental Technology, Inc. (Cambria) is submitting this workplan to further define the distribution of hydrocarbons in groundwater at the site referenced above. On September 15, 2004, Cambria submitted a workplan to ACHCSA to further define the horizontal extent of hydrocarbon impact in groundwater. In September 2005, Cambria attempted the proposed scope of work, but was unable to complete the work due to numerous underground utility lines located along Piedmont Avenue and Montell Street (Figure 2). Presented below is the site background and Cambria's revised scope of work, to define the horizontal extent of hydrocarbon impact in groundwater.

## **SITE DESCRIPTION AND BACKGROUND**

The site is located on the eastern corner of Piedmont Avenue and Montell Street in Oakland, California (Figure 1). The property is currently used for commercial purposes and bound by Piedmont Avenue to the northwest, Montell Street to the southwest, an apartment building to the southeast and a commercial property (restaurant) to the northeast. Local topography gently slopes to the south-southwest. A map illustrating the current and former site features is shown in Figure 2.

The site was a Chevron service station until 1978. At least four underground storage tanks (USTs) were located at the subject site. Other tanks include two used-oil tanks located along the eastern site boundary, a 7,500-gallon underground storage tank (UST) and one other UST of an unknown size and contents located further to the west. After the service station was removed in October 1978, a commercial building was constructed on the eastern portion of the property along Piedmont Avenue and the western portion of the property was converted into a parking lot. Before 1998, the building was used by Homestead Federal Savings Association. Pacific Bell mobile service agent PCS Smart Mart occupied the building before 2003. Currently, the site is occupied by a Cingular Wireless store.

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**Site Geology:** This site is located at the western edge of the Piedmont Hills, approximately 2 miles east of San Francisco Bay and 1 mile north of Lake Merritt. The soil in the site vicinity consists of Late Pleistocene alluvium consisting of weakly consolidated, slightly weathered, poorly sorted, irregularly interbedded clay, silt, sand and gravel. Coarser grained materials including clayey gravel and sandy to gravelly silt, were observed immediately below ground surface. These materials extended to depths ranging from 4 to 15.5 feet below grade (fbg) and are underlain by clay and sandy clay. The nearest surface water is Glen Echo Creek located approximately 400 feet east-southeast of the site.



**Groundwater Direction, Depth Trends and Gradient Trend:** Groundwater depth has varied from about 4.5 to 13 fbg. The groundwater flow direction fluctuated between southwest, west and northwest at gradients ranging from 0.005 to 0.04. A rose diagram showing the flow direction and gradient for various quarters between 2000 and February 2004 is presented on Figure 2.

## PROPOSED SCOPE OF WORK

To further evaluate the extent of hydrocarbons in groundwater, Cambria proposes four Geoprobe® soil borings with grab groundwater samples. Boring locations are shown on Figure 2. Cambria's standard operating procedures are presented as Attachment A. The specific scope of work is discussed below.

**Underground Utility Location:** Cambria will notify underground service alert (USA) prior to field work to clear boring locations with utility companies. A private utility line locator will be contracted to additionally clear boring locations of utility lines.

**Site Health and Safety Plan:** Cambria will prepare a site safety plan to inform site workers of known hazards and to provide health and safety guidance. The plan will be kept on site at all times and signed by all site workers.

**Permits:** Cambria will obtain boring permits from the Alameda County Water District (ACWD) and an encroachment permit from the City of Oakland prior to beginning field operations. A minimum of 72-hours notice will be given to the ACWD prior to field work.

**Access Agreements:** Cambria will obtain the necessary access agreements with the property owner's prior to beginning field work.

**Soil borings:** Cambria proposes advancing four Geoprobe® soil borings. After clearing to 8 fbg using a combination of air knife and hand auger, each boring will be advanced to approximately 15 feet below first encountered groundwater. Soil will be logged and sampled at 5 foot intervals beginning at 5 fbg. Upon completion of each boring and collection of groundwater samples as described below, the borings will grouted to surface with neat Portland cement. Cambria's Standard Field Procedures are presented as Attachment A.

**Soil Screening:** Soil samples will be screened using a photoionization detector (PID). PID readings, evidence of discoloration, stratigraphic location, the depth to groundwater, and the collection depth of previous samples containing hydrocarbons will be used to select soil samples for laboratory analysis.

**Grab Groundwater Sampling:** A grab groundwater sample will be collected from each borehole at first encountered groundwater and a second sample will be collected at approximately 10 to 15 feet below first encountered water. The ground water samples will be decanted into the appropriate containers supplied by the analytic laboratory. Samples will be labeled, placed in protective foam sleeves, stored on crushed ice at or below 4° C, and transported under chain-of-custody to the laboratory.

**Chemical Analysis:** The grab-groundwater samples and select soil samples will be analyzed for:

- TPHg by Northern California LUFT method, and
- Benzene, toluene, ethylbenzene, and xylenes (BTEX), fuel oxygenates methyl tert-butyl ether (MTBE), tert-butyl alcohol (TBA), di-isopropyl ether (DIPE), tert-amyl methyl ether (TAME), ethyl tert-butyl ether (ETBE), 1,2-dichloroethane (1,2-DCA), and ethyl dibromide (EDB) by EPA Method 8260B, and

**Soil and Water Disposal:** Soil cuttings will be temporarily stockpiled and covered with plastic or placed in sealed DOT-approved drums on-site. Rinsate water will be stored in drums pending proper disposal. Following review of laboratory analytical reports, wastes will be transported to a Chevron approved disposal facility.

**Reporting:** Upon completion, Cambria will document all field activities and analytical results in a report that, at a minimum, will contain:

- A brief summary of the site background and history,
- Boring logs,

- Tabulated soil and groundwater sample analytical results,
- A figure illustrating the location of the borings,
- Analytical reports and chain-of-custody forms,
- Soil/water disposal methods,
- A discussion of hydrocarbon distribution in soil and groundwater at the site, and
- Cambria's conclusions and recommendations.

**SCHEDULE**



Cambria will coordinate and perform the above activities after receiving written approval of this work plan from the ACHCSA Agency. Cambria will submit an investigation report approximately six to eight weeks after completion of field activities.

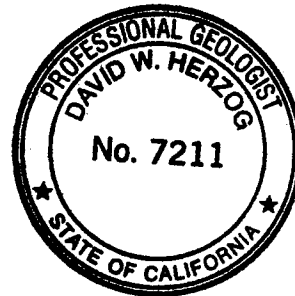
**CLOSING**

We appreciate this opportunity to work with you on this project. Please contact Mr. John Bostick at (916) 677-3407 (ext. 107) if you have any questions or comments.

Sincerely,  
**Cambria Environmental Technology, Inc.**

John Bostick  
Staff Scientist

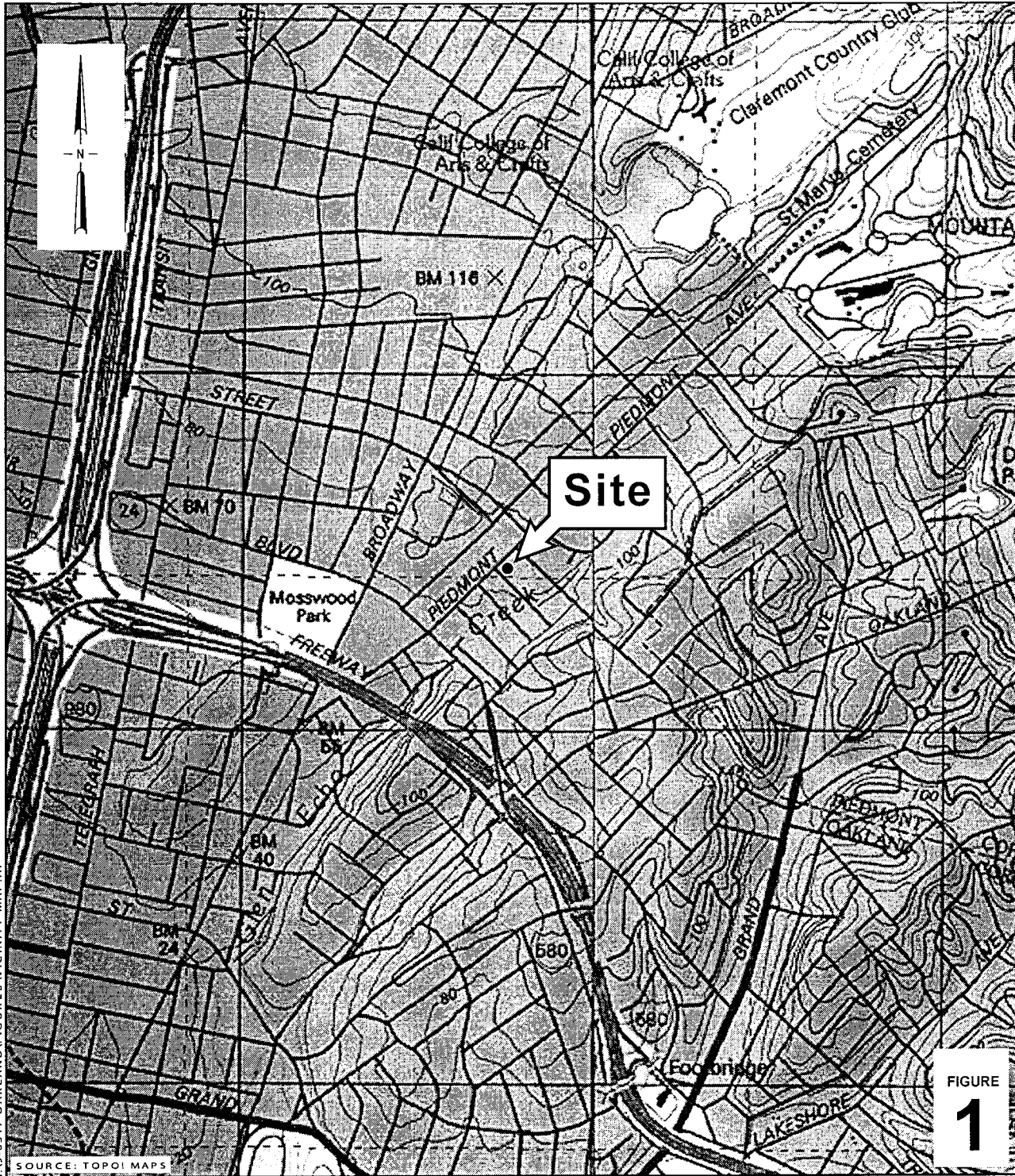
David W. Herzog  
Senior Project Geologist # 7211



Figures:        Figure 1 – Vicinity Map  
                    Figure 2 – Site Plan

Attachments:   A - Standard Field Procedures for Geoprobe Soil and Groundwater Sampling

cc:                Mr. Dana Thurman, Chevron Environmental Management Company  
                    P.O. Box 6012, K2236, San Ramon, CA 94583  
                    Cambria File Copy



FIGURE

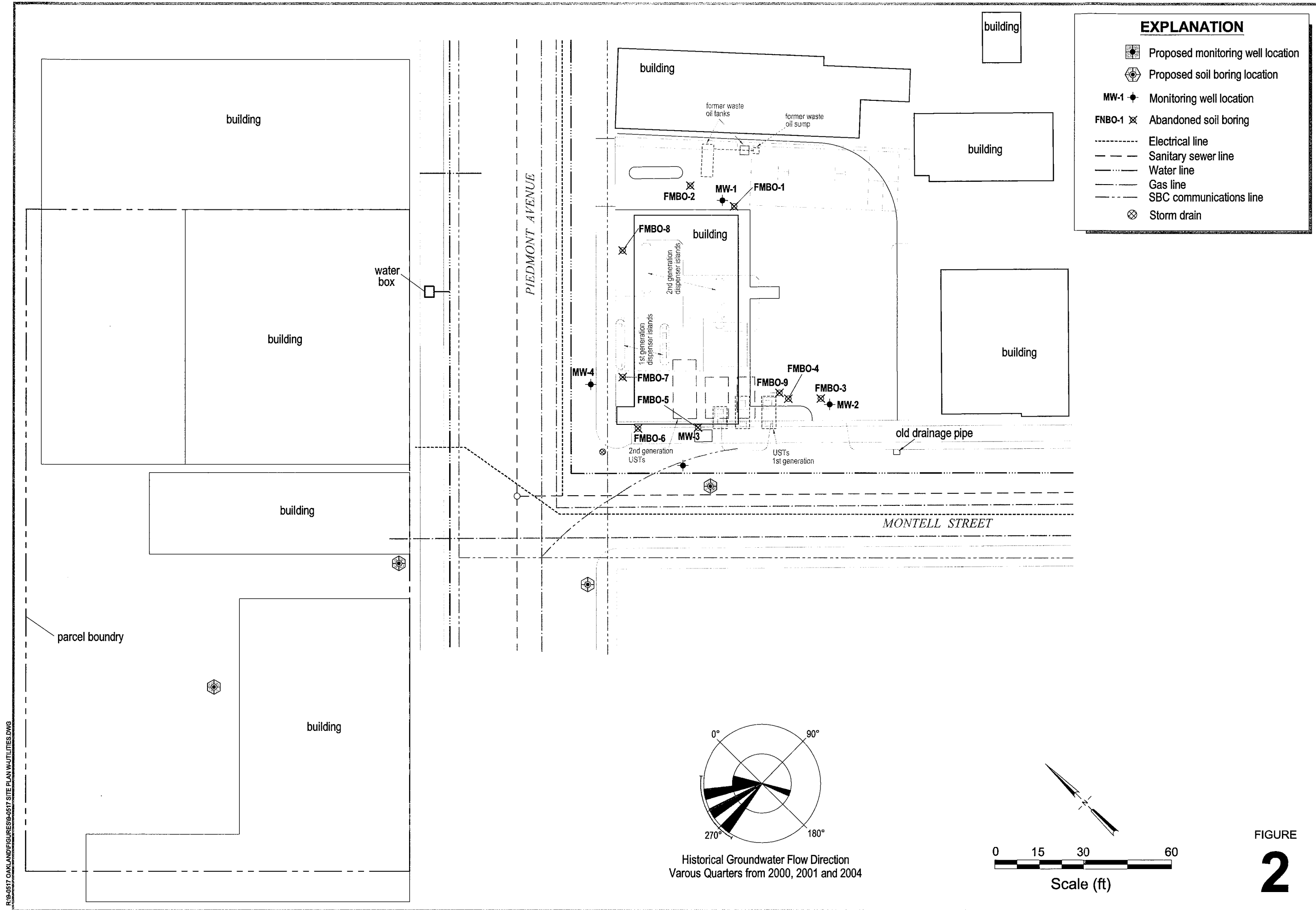
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**Former Chevron Station 9-0517**  
 3900 Piedmont Avenue  
 Oakland, California



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Vicinity Map



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Site Plan with  
Approximate Utility Locations



Former Chevron Service Station 9-0517  
3900 Piedmont Avenue  
Oakland, California

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**ATTACHMENT A**

**Standard Field Procedures for Geoprobe Soil and Groundwater  
Sampling**



# CAMBRIA

## STANDARD FIELD PROCEDURES FOR GEOPROBE® SOIL AND GROUNDWATER SAMPLING

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

### Objectives

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

### Soil Classification/Logging

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

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

### Soil Sampling

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

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

### Sample Storage, Handling and Transport

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

# CAMBRIA

## Field Screening

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

## Grab Ground Water Sampling

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

## Discrete Depth Soil and Ground Water Sampling

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

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

## Duplicates and Blanks

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

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## **Grouting**

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

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