

February 3, 2000

Mr. Don Hwang
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
1285 Bancroft Avenue
San Leandro, California
Incident #98996067
Cambria Project #241-0504-008



Dear Mr. Hwang:

On behalf of Equiva Services LLC (Equiva), Cambria Environmental Technology, Inc. (Cambria) is submitting this Site Investigation Work Plan for the above-referenced site. This work plan responds to Alameda County Health Care Services Agency (ACHCSA) correspondence dated November 5, 1999. In this letter, ACHCSA requested a work plan to further characterize the site. This work plan was originally due on January 3, 2000, but this due date was extended to February 3, 2000 in ACHCSA correspondence dated December 17, 1999.

PROPOSED SCOPE OF WORK

ACHCSA notes elevated levels of benzene and methyl tertiary butyl ether (MTBE) in recently installed downgradient well MW-6. As a result of these detections, further site characterization and delineation are requested. The possibility of employing measures to expedite degradation of the benzene plume is also mentioned in this correspondence.

We propose the following measures to expedite remediation of the contaminant plume beneath the site and to monitor down-gradient groundwater conditions:

- Enhanced biodegradation through injection of hydrogen peroxide into wells MW-2 and MW-3,
- Periodic groundwater extraction from well MW-6,
- Conduct a soil vapor survey investigation for collection of site specific parameters to incorporate into a Tier II RBCA, and
- Continued monitoring and sampling of the offsite irrigation well located down-gradient of the plume.

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Portland, OR
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ENVIRONMENTAL
PROTECTION

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1% = 10,000 ppm

Specific tasks proposed to complete these objectives are as follows:

Site Health and Safety Plan: We will prepare a comprehensive site safety plan to protect site workers. The plan will be kept on site during field activities and signed by each site worker.

Hydrogen Peroxide Injection: We will add an approximate 4% solution of hydrogen peroxide into two onsite wells (MW-2 and MW-3) located adjacent to primary source areas (Figure 1). During each injection event, approximately 30 gallons of hydrogen peroxide solution will be added into each well and allowed to infiltrate. Following the addition of the hydrogen peroxide, a slug of tap water will be added to the well to help facilitate the infiltration of the hydrogen peroxide into the aquifer. The amount of hydrogen peroxide and tap water added to each well will be based on the diameter of the well, depth to groundwater, and the permeability of the soil. Hydrogen peroxide will be added immediately following the next scheduled quarterly monitoring event and will be added on a weekly basis for a period of six weeks. The concentration of hydrogen peroxide solution may be increased throughout the series of injections, depending on temperature measurements.

Following the six-week period, the wells will be allowed to equilibrate prior to the collection of subsequent quarterly groundwater samples.

Bioparameter Monitoring: Measurements of groundwater for dissolved oxygen, oxidation/reduction potential (ORP or Eh), pH, conductivity and temperature will be collected in the field. Groundwater samples will also be analyzed for alkalinity, nitrate, sulfate and ferrous iron by EPA Methods 310.2, 353.2, 375.4, and 200.7, respectively. These measurements will be collected prior to the initial hydrogen peroxide injection for background, and during each quarterly sampling event to monitor the effectiveness of the treatment.


Periodic Groundwater Extraction: Weekly groundwater extraction from well MW-6 will be initiated to lower benzene concentrations and minimize plume migration to the adjacent residential area. Each extraction event will consist of pumping from this well until 500 gallons are removed or until the well dewateres.

Plume Delineation: In its letter, ACHCSA requests further delineation of the contaminant plume. However, petroleum hydrocarbons and MTBE were not detected in the existing offsite irrigation well located down-gradient of the plume. We will continue to collect and analyze groundwater samples from this well on a quarterly basis to ensure that the plume is delineated in the downgradient direction.

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Soil Vapor Survey Investigation

Cambria will conduct a soil vapor survey investigation. Our objective is to collect in-situ vapor and physical soil property samples for a Tier II RBCA evaluation of the potential risk to offsite receptors by hydrocarbon vapor migration. Cambria will complete six geoprobe borings at the locations shown on Figure 1 for the collection of soil vapor, soil chemical, and physical soil property samples. Our proposed scope of work for the soil vapor survey investigation is detailed below:



Boring Locations: Cambria will install six geoprobe borings at the locations shown on Figure 1. In addition to soil and groundwater chemical samples, Cambria will collect in-situ soil vapor samples and soil property samples. The borings will be installed to about 30-35 feet below grade.

Sample Collection: Soil samples for chemical analysis will be collected at 5-ft intervals from the unsaturated zone and from the capillary fringe at about 35-ft. Soil vapor samples will be collected at depths of 5-ft, 10-ft, 20-ft, and from the capillary fringe at about 35-ft. Soil physical samples will be collected from the vadose zone at 10-ft and from the capillary fringe at about 35-ft.

Soil Chemical Analysis: Soil and groundwater samples collected for chemical analysis will be analyzed for TPHg by EPA Method 8015, and BTEX and MTBE by EPA Method 8020. All MTBE detected by EPA Method 8020 will be confirmed by EPA Method 8260.

Soil Vapor Chemical Analysis: In-situ soil vapor samples will be collected from each of the proposed six borings in one liter Summa-type canisters. Soil vapor samples will be analyzed for TPHg and BTEX by EPA Method TO-3. TO-3 is the appropriate method as the primary compound of concern is benzene. Method TO-3 can achieve a method detection limit of .001 parts per million for BTEX compounds.

Soil Property Analysis: Soil samples designated for soil physical properties will be analyzed for dry bulk density, moisture content, porosity, and fraction organic carbon.

Vapor Purge Protocol: Cambria field personnel will calculate the volume of air within the vapor sample tube. After the known volume of the sample tube is determined, a minimum of three tube volumes will be purged by a bladder air pump equipped with a flow gauge. This protocol for pre-purging the sample tube will be followed for each discrete sample location. Sample tubing will be replaced between each sample to avoid cross contamination of samples.

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Implementation of Proposed Activities: Quarterly monitoring for the third quarter and fourth quarters of 1999 has been completed. Implementation of the activities described in this work plan is proposed concurrent with the second quarter 2000 quarterly monitoring event, subject to ACHCSA approval. This quarterly event is scheduled for April 2000.

Reporting: After the analytical results are received from the quarterly monitoring event subsequent to the series of hydrogen peroxide injections, Cambria will prepare an expanded quarterly monitoring report that, at a minimum, will contain:

- Descriptions of field activities, including the volume of hydrogen peroxide added,
- Volume of groundwater extracted from well MW-6,
- Tabulated groundwater analytic and bioparameter measurement results,
- Analytic reports and chain-of-custody forms, and
- A summary of the effectiveness of the hydrogen peroxide injection and groundwater extraction.

Tier II RBCA: Cambria will prepare a Tier II RBCA incorporating the data collected from the soil vapor survey investigation. The RBCA will also include a summary of the soil vapor survey investigation.

Mr. Don Hwang
February 3, 2000

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CLOSING

Thank you for your assistance with this project. Please call Darryk Ataide at (510) 420-3339 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.



Darryk Ataide, REA I
Project Manager

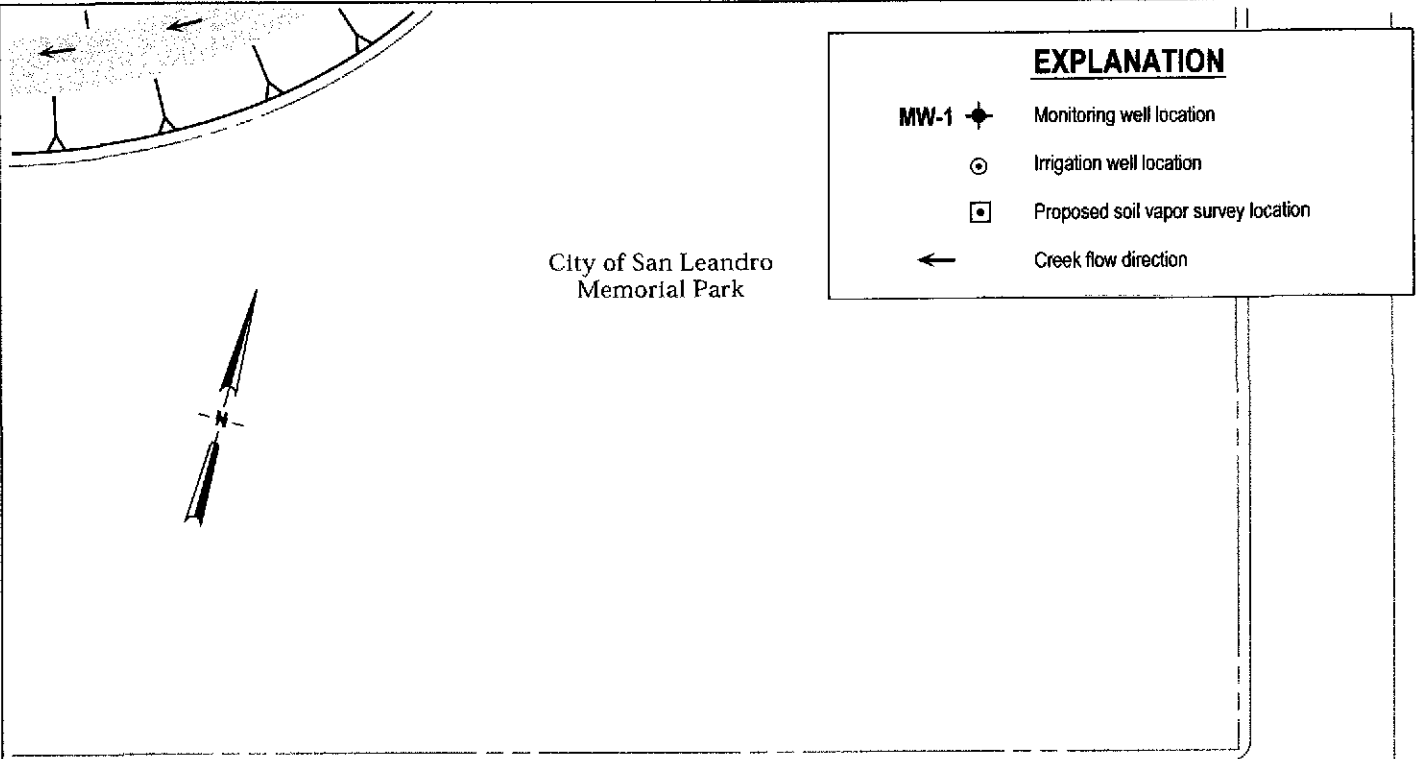


Ailsa S. Le May, R.G.
Senior Geologist

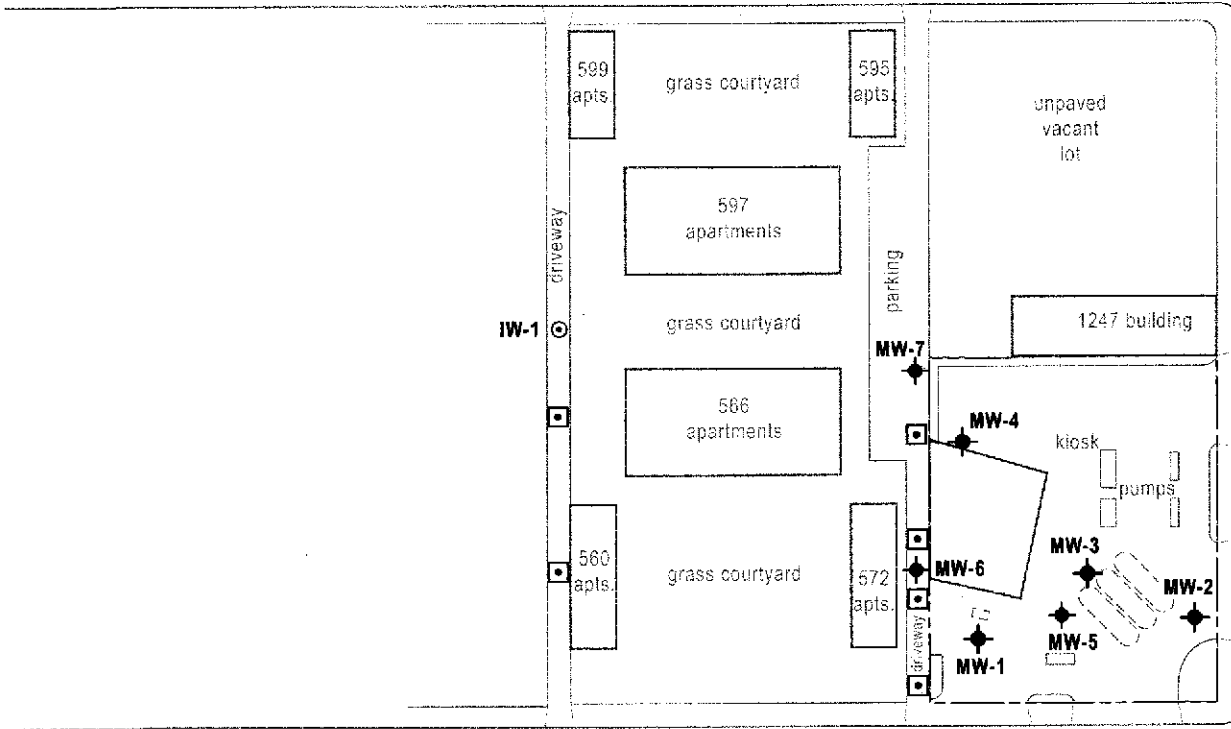


cc: Karen Petryna, Equiva Services LLC, P.O. Box 7869, Burbank, CA 91510-7869
Mr. Mike Bakaldin, City of San Leandro, 835 E. 14th Street, San Leandro, CA 94577

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CALLAN AVENUE



BANCROFT AVENUE

ESTUDILLO AVENUE

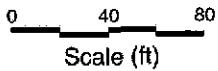


FIGURE 1

G:\SNL-1285\FIGURES\SITE PLAN.A1

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**Site Plan with Soil Vapor
 Survey Locations**