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CAMBRIA

ENVIRONMENTAL PROTECTION

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May 14, 1998

Ms. Pamela Evans
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Re: **Investigation Work Plan**
Shell Service Station
9750 Golf Links Road
Oakland, California
WIC #204-5508-2808
Cambria Project #240-0735-984

Dear Ms. Evans:

On behalf of Shell Oil Products Company (Shell), Cambria Environmental Technology, Inc. (Cambria) is submitting this *Investigation Work Plan* for the site referenced above. This work plan was requested by the Alameda County Department of Environmental Health (ACDEH) in an April 10, 1998 letter. The objective of this investigation is to define the vertical extent of hydrocarbons in soil and ground water on site. A site summary and the proposed scope of work for this investigation are presented below.

SITE SUMMARY

Site Location: This operating Shell service station is located at the intersection of Golf Links Road and Mountain Boulevard in Oakland, California (Figure 1). The area surrounding the site is both commercial and residential. Highway 580 runs near the northern boundary of the site.

1995 Waste Oil Underground Storage Tank (UST) Removal: On March 7, 1995, Weiss Associates of Emeryville, California (WA) observed the removal of a 550-gallon, single-walled, steel waste oil UST and collected soil samples from the tank excavation floor and sidewalls. The highest hydrocarbon concentrations were 190 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg) and 3,900 mg/kg total petroleum hydrocarbons as diesel (TPHd). No benzene was detected.

1995 Subsurface Investigation: On December 15, 1995, WA installed one soil boring in the vicinity of the former waste oil UST. The only hydrocarbons detected were 2.8 mg/kg TPHd at 30.5 feet below ground surface (ft bgs) and 56 mg/kg petroleum oil and grease at 40.5 ft bgs. No ground water was encountered at a maximum depth explored of 48 ft bgs.

CAMBRIA
ENVIRONMENTAL
TECHNOLOGY, INC.
1144 65TH STREET,
SUITE B
OAKLAND,
CA 94608
PH: (510) 420-0700
FAX: (510) 420-9170

1998 Dispenser Upgrade: On February 4, 1998, Cambria observed station upgrade activities and collected soil samples from beneath one dispenser based on field observations. **The highest hydrocarbon concentrations were 7,800 mg/kg TPHg and 37 mg/kg benzene beneath** dispenser D-4 at 4.0 ft bgs (Figure 1). No field indications of hydrocarbons were observed beneath the other dispensers.

PROPOSED SCOPE OF WORK

Because no indications of hydrocarbons were observed beneath the three down gradient dispensers, we propose to determine the vertical extent of hydrocarbons in the impacted area by drilling one soil boring using a Geoprobe® direct-push rig (Figure 1). Soil and grab ground water samples will be analyzed for TPHg, benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tert-butyl ether (MTBE).

Our scope of work for this investigation includes the following tasks.

Utility Location: Cambria will notify Underground Service Alert (USA) of our drilling activities. USA will have the utilities in the site vicinity identified. Due to proximity of the proposed soil boring to the active USTs and pump islands, we will review available engineering plans for the site, and if necessary, survey the location using a private line locating firm.

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.

Permits: We will obtain permits for the installation of the boring from the Alameda County Public Works Agency.

Soil Boring: Assuming the absence of overhead and subsurface obstructions, Cambria will drill one soil boring at the location shown on Figure 1. We will collect soil samples at five foot intervals, at lithologic changes, and from just above the water table, if encountered. The boring will be advanced until no hydrocarbons are detected by field screening methods or until refusal is encountered, and will have an anticipated total boring depth of 25 to 30 ft bgs. Upon completion of the sampling, the boring will be sealed with cement grout to match the existing ground surface. We will select soil samples for chemical analysis based on observations of staining and odor and on the results of field screening with a photo-ionization detector. If ground water is encountered in the boring, we will also collect a grab ground water sample to measure hydrocarbon concentrations. Our standard field procedures are presented as Attachment A.

Chemical Analysis: Selected soil and ground water samples will be analyzed for TPHg by modified EPA Method 8015, and BTEX and MTBE by EPA Method 8020.

Reporting: After we receive the analytic results, we will prepare a report that, at a minimum, will contain:

- A summary of the site background and history;
- Descriptions of the drilling and sampling methods;
- The boring log;
- Tabulated soil and ground water analytical results;
- Analytical reports and chain-of-custody forms; and
- A discussion of the hydrocarbon distribution in soil and ground water.

SCHEDULE

Upon receiving written approval of this work plan from the ACDEH, Cambria will obtain any necessary permits and schedule drilling. We plan to submit our investigation report approximately six weeks after completing the field work.

CAMBRIA

CLOSING

We appreciate this opportunity to work with you on this project. Please call if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

Maureen Feineman
Staff Geologist

Diane Lundquist, P.E.
Principal Engineer

REGISTERED PROFESSIONAL ENGINEER
DIANE M. LUNDQUIST
NO. C46725
CIVIL
STATE OF CALIFORNIA

Attachments: A - Standard Field Procedures for Geoprobe®

cc: A. E. (Alex) Perez, Shell Oil Products Company, P.O. Box 8080, Martinez, California 94553

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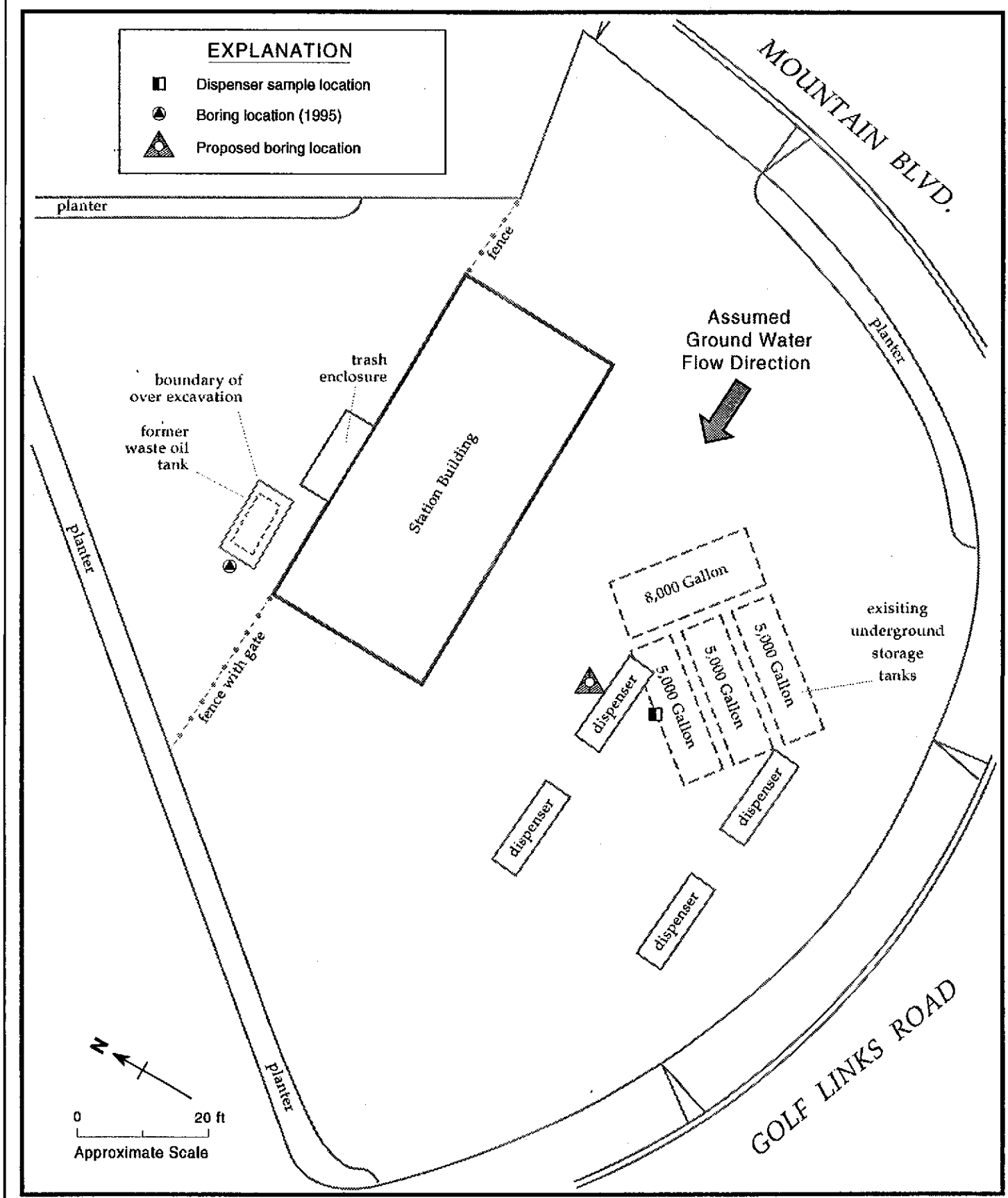

Figure 1. Dispenser Sample Location - Shell Service Station, 9750 Golf Links Road, Oakland, California

Attachment A

Standard Field Procedures for Geoprobe®

STANDARD FIELD PROCEDURES FOR GEOPROBE® 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 Registered Geologist (RG) 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.

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.

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.

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.