Shell Oil Products US

January 6, 2003

Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Subject: **Shell-branded Service Station**
6039 College Avenue
Oakland, California

Dear Mr. Chan:

Attached for your review and comment is a copy of the *Subsurface Investigation Work Plan* for the above referenced site. Upon information and belief, I declare, under penalty of perjury, that the information contained in the attached document is true and correct.

As always, please feel free to contact me directly at (559) 645-9306 with any questions or concerns.

Sincerely,

Shell Oil Products US

Karen Petryna

Karen Petryna
Sr. Environmental Engineer

P.O. Box 7869 Burbank, CA 91510-7869 Phone (559) 645-9306 Facsimile (559) 645-5643

CAMBRIA

January 6, 2003

Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: **Subsurface Investigation Work Plan**
Shell-branded Service Station
6039 College Avenue
Oakland, California
Incident # 98995745
Project # 245-0503

Dear Mr. Chan:

Cambria Environmental Technology, Inc. (Cambria) is submitting this *Subsurface Investigation Work Plan* on behalf of Equilon Enterprises LLC dba Shell Oil Products US (Shell). The objective of this investigation is to define the extent of the methyl-tertiary-butyl ether (MTBE) plume southwest of the site and to determine whether offsite utility trenches provide preferential pathways for chemical migration. The site background and proposed scope of work for this investigation are presented below.

SITE BACKGROUND

Location and Site Use: The Shell service station at 6039 College Avenue, Oakland, California is situated in a mixed commercial/residential neighborhood. The service station has been in operation since 1940. Ground water sampling has been performed at the site since 1990.

1957 Underground Storage Tank (UST) Removal and Replacement: In 1957, one 550-gallon and three 1,000-gallon steel USTs containing gasoline, and one 110-gallon single-walled steel waste oil tank were removed. These tanks were apparently installed when the station first opened in 1940. The tanks were replaced by three 5,000-gallon leaded gasoline tanks and one 1,000-gallon waste oil tank, all of single-wall steel construction.

1978 UST Removal and Installation: In 1978, one 8,000-gallon and three 5,000-gallon steel USTs and one 1,000-gallon waste oil tank were removed. It is not clear from the available data when the 8,000-gallon tank was installed. The tanks were replaced by three 10,000-gallon fiberglass USTs for gasoline storage.

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1989 Unauthorized Release: In September 1989, the Alameda County Department of Environmental Health received notification of an unauthorized release from a UST. The source of the release was reported as a slight weep at the piping connection to the submersible pump for a gasoline tank.

1990 Soil Borings: In January 1990, Harding Lawson Associates (HLA) drilled soil borings B-1 through B-6 to a depth of approximately 25 feet below ground surface (bgs). Up to 610 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHg), 5,900 ppm total petroleum hydrocarbons as diesel (TPHd), 110,000 ppm total petroleum hydrocarbons as motor oil, and 0.57 ppm benzene were detected in soil samples from borings B-3 and B-6. Petroleum hydrocarbon concentrations were near or below laboratory detection limits in soil samples collected from borings B-1, B-2, B-4, and B-5.

1990 Soil Boring and Well Installations: In February 1990, HLA drilled and installed groundwater monitoring wells MW-1 through MW-4 to a depth of 25 feet bgs. Up to 230 ppm TPHg and 1.1 ppm benzene were detected in soil samples collected from the MW-3 and MW-4 borings. Petroleum hydrocarbon concentrations were near or below laboratory detection limits in soil samples collected from the MW-2 boring.

1991 Soil Boring and Well Installation: In August 1991, HLA installed monitoring well MW-5 to a depth of 28 feet bgs. Although 23 ppm of a petroleum mixture other than gasoline was detected in a soil sample from 16 feet, no benzene was detected in any of the samples.

1993 Soil Boring and Well Installation: In March 1993, Weiss Associates (WA) drilled soil borings BH-A through BH-E and converted boring BH-E into monitoring well MW-6. Up to 580 ppm TPHg, 0.42 ppm benzene and 930 ppm petroleum oil and grease were detected in soil samples collected from borings BH-A, BH-C and BH-D. No petroleum hydrocarbons were detected in soil samples collected from boring BH-B and only 3.5 ppm TPHd were detected in soil samples collected from boring BH-E (well MW-6).

Separate-Phase and Dissolved-Phase Hydrocarbon Removal: Weekly extraction of separate-phase hydrocarbons (SPH) and dissolved-phase hydrocarbons was initiated at this site in September of 1999. Between September 22 and November 10, 1999, Advanced Cleanup Technologies, Inc. of Benicia, California extracted SPH and groundwater from wells MW-3 and MW-4 with a vacuum truck. Beginning November 10, 1999, Blaine Tech Services, Inc. (Blaine) of San Jose, California took over the weekly purging events as the volume of groundwater and SPH removed each week was not sufficient to warrant using a vacuum truck. Due to the absence of SPH in MW-4, weekly purging events by Blaine were discontinued on June 8, 2000. No SPH was detected in the first quarter of 2001. SPH reappeared in the second and third quarters of 2001, and monthly extraction was resumed in December 2001. Monthly mobile groundwater

extraction was restarted in December 2001 and has removed an approximate total of 2.2 pounds of hydrocarbons and 2.3 pounds of MTBE to date.

August 2001 Site Conceptual Model and Well Receptor Survey and Conduit Study: Shell voluntarily instructed Cambria to prepare and submit a site conceptual model and well receptor survey. The receptor survey identified three surface water bodies and five potential receptor wells within a ½-mile radius of the site. Due to either their distance from the site or their location upgradient and crossgradient of the site, it is unlikely that any of these wells would be impacted by hydrocarbons originating from the site. The findings from the conduit investigation indicated that there is potential for preferential pathway migration of petroleum hydrocarbons in existing horizontal utility trenches.

PROPOSED SCOPE OF WORK

To define the extent of the hydrocarbon and MTBE plume on- and offsite, Cambria will install a total of five Geoprobe® soil borings. Soil borings SB-1 and SB-2 will be installed onsite, downgradient of the existing pump islands; boring SB-3 will be installed near the southwestern boundary of the site; and borings SB-4 and SB-5 will be installed in Claremont Avenue to determine whether hydrocarbons or oxygenates from the site have impacted utility trenches downgradient of the site. The soil borings will be advanced to the current groundwater depth of approximately 15 feet below grade. The borings will be continuously sampled for lithologic logging. Soil samples from onsite borings SB-1 and SB-2 will be collected at 5-foot intervals and submitted for chemical analysis. At least one soil sample from each of borings SB-3, SB-4 and SB-5 will be collected close to, but above the water table and submitted for chemical analysis. Additional soil samples may be selected for chemical analysis based on field observations such as odor, staining and PID screening of the samples. In addition, grab groundwater samples will be collected from each of the borings.

Upon approval of this work plan by Alameda County Health Care Services Agency (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. Due to the proximity of the proposed borings to underground utilities, a contracted subsurface utility locator will also be used to clear the locations of the borings prior to drilling.

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: We will obtain required permits for well installation from the Alameda County Public Works Agency and an encroachment permit from the City of Oakland.

Soil Borings: A total of five soil borings will be advanced using a limited-access, direct-push (Geoprobe®) drilling rig. Cambria's standard procedures for soil borings are included as Attachment A. Upon completion, the borings will be sealed with cement grout to match the existing grade. Samples will be transported to a state-approved analytical laboratory for chemical analysis. Cambria's Standard Field Procedures for Geoprobe® Sampling are presented as Attachment B.

Laboratory Analyses: Soil samples will be analyzed for TPHg, benzene, toluene, ethylbenzene, xylenes, and MTBE by EPA Method 8260B.

Subsurface Investigation Report: After the analytical results are received, Cambria will prepare a report that, at a minimum, will contain:

- A summary of the site background and history;
- Descriptions of drilling and sampling activities;
- Soil boring logs;
- Tabulated analytical results for groundwater;
- Analytical reports and chain-of-custody forms;
- A discussion of the hydrocarbon and MTBE distribution in the subsurface; and
- Conclusions and recommendations

SCHEDULE

Upon receiving written approval of this work plan from the ACHCSA, Cambria will apply for the necessary permits and schedule drilling. We will provide you with a 72-hour notice prior to field activities. We anticipate submitting our investigation report within 60 days of completing the fieldwork.

CLOSING

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

Sincerely,
Cambria Environmental Technology, Inc.

Melody Munz
Project Engineer

Matthew W. Derby, P.E.
Senior Project Engineer

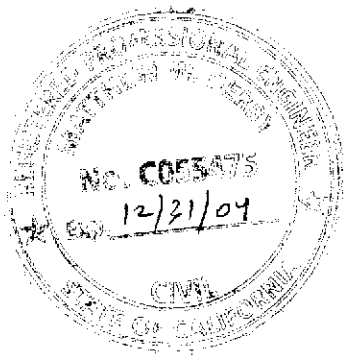

Figure: 1 - Proposed Soil Boring Location Map

Attachments: A - Standard Field Procedures for Soil Borings and Monitoring Well Installation
B - Standard Field Procedures for Geoprobe® Sampling

cc: Karen Petryna, Shell Oil Products US, P.O. Box 7869, Burbank, CA 91510-7869
Russell J. Bruzzone, Inc. 899 Hope Lane, Lafayette, CA 94549
Montrose Investment Co., 242 Rivera Circle, Greenbrae Marina, Larkspur, CA 94939, Attn: Jim Graham

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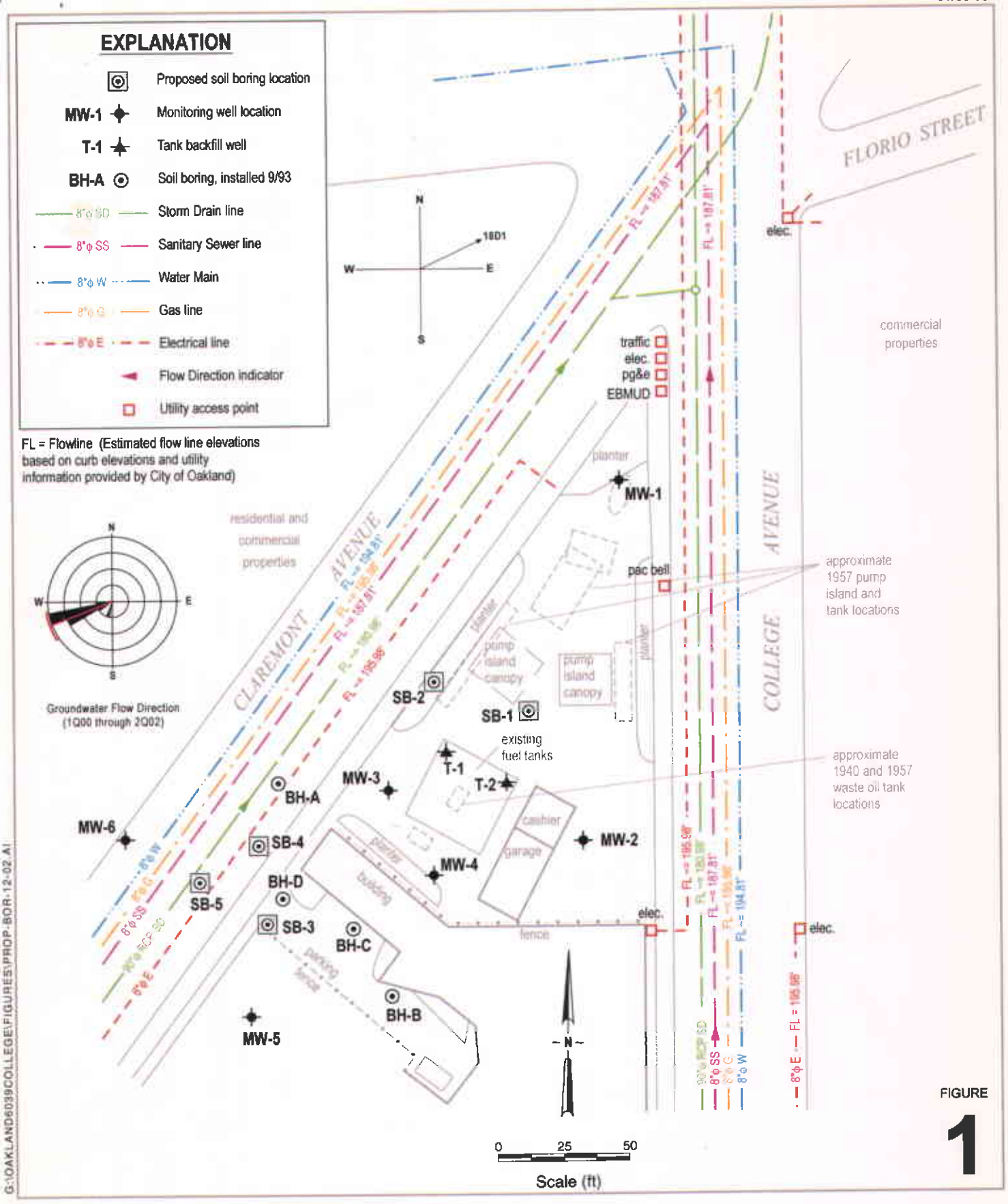

FIGURE

1

Shell-branded Service Station
6039 College Avenue
Oakland, California
Incident #98995745

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Proposed Soil Boring Location Map

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ATTACHMENT A

Standard Field Procedures
for Soil Borings and Monitoring Well Installation

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STANDARD FIELD PROCEDURES FOR SOL BORING AND MONITORING WELL INSTALLATION

This document presents standard field methods for drilling and sampling soil borings and 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.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned 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 Analysis

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

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater 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. 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.

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.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Groundwater monitoring wells are installed 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 fee 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 feet 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.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples in addition to any analytes required by the receiving disposal facility. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling is typically stored onsite in sealed 55-gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Upon receipt of analytic results, the water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

ATTACHMENT B

Standard Field Procedures for Geoprobe® Sampling

CAMBRIA

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.