Chevron Environmental Management Company
6001 Bollinger Canyon Rd, K2236
P.O. Box 6012
San Ramon, CA 94583-2324
Tel 925-842-9559
Fax 925-842-8370

Dana Thurman
Project Manager

ChevronTexaco

May 8, 2006
(date)

Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Chevron Service Station # 9-8139

Address: 16304 Foothill Boulevard, San Leandro, California

I have reviewed the attached report titled *Revised Investigation Workplan* and dated May 8, 2006.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Cambria Environmental Technology, Inc., upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Dana Thurman
Project Manager

Enclosure: Report

CAMBRIA

May 8, 2006

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

Re: **Revised Investigation Workplan**
Chevron Service Station 9-8139
16304 Foothill Boulevard
San Leandro, California

Dear Mr. Chan:

Cambria Environmental Technology, Inc. (Cambria) has prepared this revised workplan on behalf of Chevron Environmental Management Company (Chevron) in response to Alameda County Health Care Services Agency's (ACHCSA) November 23, 2005 letter (Attachment A). In addition to the work originally proposed in Cambria's October 17, 2005 workplan, ACHCSA requested additional on-site soil and groundwater evaluation, an extraction well in place of the originally proposed monitoring well, and a remedial proposal. Cambria's revised scope of work is presented below.

SITE DESCRIPTION

The site is located on the eastern side of Foothill Boulevard in San Leandro, California (Figure 1). The site is currently an active Chevron-branded Service Station with a convenience store. The station is owned and operated by Mr. Harv Dahliwal. Chevron ceased operation of its station in 1998, and removed the existing facilities including a station building, three gasoline-underground storage tanks (USTs), two dispenser islands, and associated product piping. The site's current facilities include two gasoline USTs and two dispenser islands. Current and former site facilities are illustrated on Figure 1.

The site is located on the western edge of the San Leandro Hills approximately four miles east of San Francisco Bay and approximately 1.25 miles south of Lake Chabot. The site is located approximately 125 ft above mean sea level.

Cambria Environmental Technology, Inc.

2000 Opportunity Drive
Suite 110
Roseville, CA 95678
Tel (916) 677-3407
Fax (916) 677-3687

PROPOSED SCOPE OF WORK

In order to address technical comments presented by ACHCSA (Attachment A), Cambria proposes the following revised scope of work. To further evaluate the vertical extent of soil and groundwater impact in the areas of the former USTs and former southern dispenser island, Cambria proposes advancing three soil borings at the locations shown on Figure 1. Following receipt of analytical data from the soil borings, a groundwater extraction well will be designed and installed in the area of the former USTs, where a monitoring well was previously proposed. Utilizing this new extraction well and existing extraction well E-2, Cambria proposes a surfactant extraction pilot test. The specific scope of work is discussed below.

Underground Utility Location: Cambria will review the as-built site plans and piping diagrams to assist in soil boring and well placement. Cambria will mark the boring locations as required and notify USA of proposed drilling activities at least 48 hours prior to field work in order for local utility companies to clear each boring location. The borings will be cleared to 8 feet below grade (fbg) by hand auger or air-knife before drilling begins to further ensure no utility lines are encountered.

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

Permits: Cambria will obtain soil boring/well installation permits from the ACHCSA prior to beginning field operations. A minimum of 72-hours notice will be given to the ACHCSA prior to field work.

Soil Borings: Cambria will advance three Geoprobe® borings at the locations shown on Figure 1. After clearing each boring to 8 fbg by hand auger, the borings will be advanced using direct push technology to approximately 35 fbg. Cambria's standard field procedures for soil borings are presented in Attachment B.

Soil Sampling: Soil samples will be collected from the borings for description and screening for hydrocarbons using a photo-ionization detector (PID), and samples will be collected at 5, 15, and 25 fbg for chemical analysis. Samples will be collected using split-barrel samplers lined with clean brass or acetate sampling tubes. Soil encountered will be recorded on a boring/well log.

Groundwater Sampling: Discrete groundwater samples will be collected from each boring at approximately 15 fbg (first encountered groundwater) and 30 fbg.

Chemical Analysis: The discrete groundwater and soil samples will be analyzed for:

- TPHg by EPA Method 8015M, and
- Benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tert-butyl ether (MTBE), tert-amyl methyl ether (TAME), and tert-butyl alcohol (TBA) by EPA Method 8260B.

Extraction Well Installation: Following receipt of analytical data from soil boring activities, one groundwater extraction well will be designed and installed in the area of the former USTs. The well boring will be advanced to approximately 25 fbg using 10-inch diameter hollow-stem augers and converted to a 4-inch diameter groundwater extraction well. The screened interval of the well casing will be constructed from approximately 10 to 25 fbg, using 0.020-inch slotted screen and number 2/12 filter sand. Actual well construction will be based on lithology and groundwater conditions encountered during the proposed soil borings activities. Cambria's standard field procedures for well installation are presented in Attachment B.

Groundwater Sampling: Gettler-Ryan (GR) will include the new extraction well in the regularly scheduled monitoring and sampling program for this site. Groundwater analytical results will be presented under separate cover in the monitoring and sampling report.

Well Elevation Survey: The top of casing elevation will be surveyed to mean sea level. Horizontal well coordinates will be measured in compliance with AB2886 (GeoTracker), and uploaded into Geotracker.

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. These wastes will be transported to an appropriate Chevron-approved disposal facility following receipt of sample analytical results.

SURFACTANT EXTRACTION PILOT TEST

Following installation of the newly installed extraction well, Cambria will conduct a pilot test utilizing that well and existing extraction well E-2 to determine if residual hydrocarbons in the 'smear-zone' can be liberated and recovered through the subsurface application of a non-ionic surfactant and subsequent enhanced vacuum fluid recovery (EVFR). The goal of the treatment is to expedite the removal of residual hydrocarbons, thereby mitigating the source of the dissolved

phase concentrations at the site and causing reduction in dissolved concentrations observed in source area monitoring wells.

Potential advantages of surfactant treatment for recovering residual hydrocarbons include:

- Residual hydrocarbons below the water table can be recovered;
- Recovery does not depend on dewatering the smear zone;
- Recovery is not restricted by hydrocarbon volatility or composition, or the thickness of the smear zone; and
- It is potentially an efficient, low cost, short term method to improve recovery.

Surfactants work by decreasing the interfacial surface tension between hydrocarbons and water, creating a micro-emulsion of oil in water. This significantly increases the mobility of the hydrocarbons during water extraction and can significantly enhance its recovery from soil contacted by the surfactant. Ideally, the residual hydrocarbons can be significantly reduced in the soil around the well resulting in significantly reduced dissolved concentrations in groundwater in the treated area.

A typical surfactant solution for remediation would consist of approximately 3 percent surfactant by volume in water. The surfactant we plan to use is Ivey-sol® selective phase transfer technology (Ivey-sol® SPTT) non-ionic surfactant, which is non-toxic, biodegradable, and is engineered for the specific hydrocarbon ranges impacting the site. A copy of the Ivey-sol® SPTT material safety data sheet (MSDS) is presented as Attachment C.

Surfactant will be injected at low pressure or gravity fed via the newly installed extraction well and extraction well E-2 to contact residual hydrocarbons in the source zone area. The rate of application will be low to minimize outward displacement of hydrocarbons during the surfactant application. The initial amount of surfactant solution to be injected will be based on a calculation of pore volume to reach a radius of at least 10 feet from each test well within the hydrocarbon-bearing soil horizon. The surfactant solution will then be allowed to equilibrate for a period of 24 to 48 hours to envelop and micro-emulsify any residual hydrocarbons in the vicinity of wells. This application will be followed by an EVFR event using a mobile vacuum truck to remove the surfactant solution and liberated hydrocarbons from the source area. During removal, the water will be periodically tested for surfactant and hydrocarbon concentrations in order to qualify the effectiveness of surfactant extraction during the pilot test. Typically, the volume of fluid withdrawn is at least three times the volume of injected surfactant solution. Cambria will repeat the surfactant application and EVFR events two times after the initial event at two-week intervals.

The efficiency of surfactant extraction will be evaluated by comparing pre- and post-treatment hydrocarbon concentrations in the extraction wells. Cambria will monitor for the rebound of hydrocarbon concentrations in the extraction wells monthly for approximately three months after the pilot test. We will compare pilot test rebound results with pre-treatment data to estimate the impact of surfactant extraction treatment on groundwater in the source area.

Chemical Analysis: All groundwater samples will be analyzed for:

- TPHg by N. California LUFT Methods, and
- BTEX, MTBE, TBA and TAME by EPA Method 8260B.

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,
- A description of the drilling technique,
- Sampling methodology and soil boring and well locations,
- Boring logs,
- Tabulated soil and groundwater sample analytic results,
- A figure illustrating the location of borings and wells, and former site features,
- Analytic reports and chain-of-custody forms,
- Soil/water disposal methods,
- A summary of pilot test activities and results,
- A discussion of hydrocarbon and MTBE distribution at the site, and
- Conclusions and recommendations.

CLOSING

Cambria will coordinate and perform the above activities after receiving written approval of this work plan from the ACHCSA. We will submit our investigation report approximately six to eight weeks after completion of field activities. Please contact me at (916) 677-3407 (ext 112), if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

David W. Herzog, PG
Senior Project Geologist

Figures: Figure 1 –Site Plan

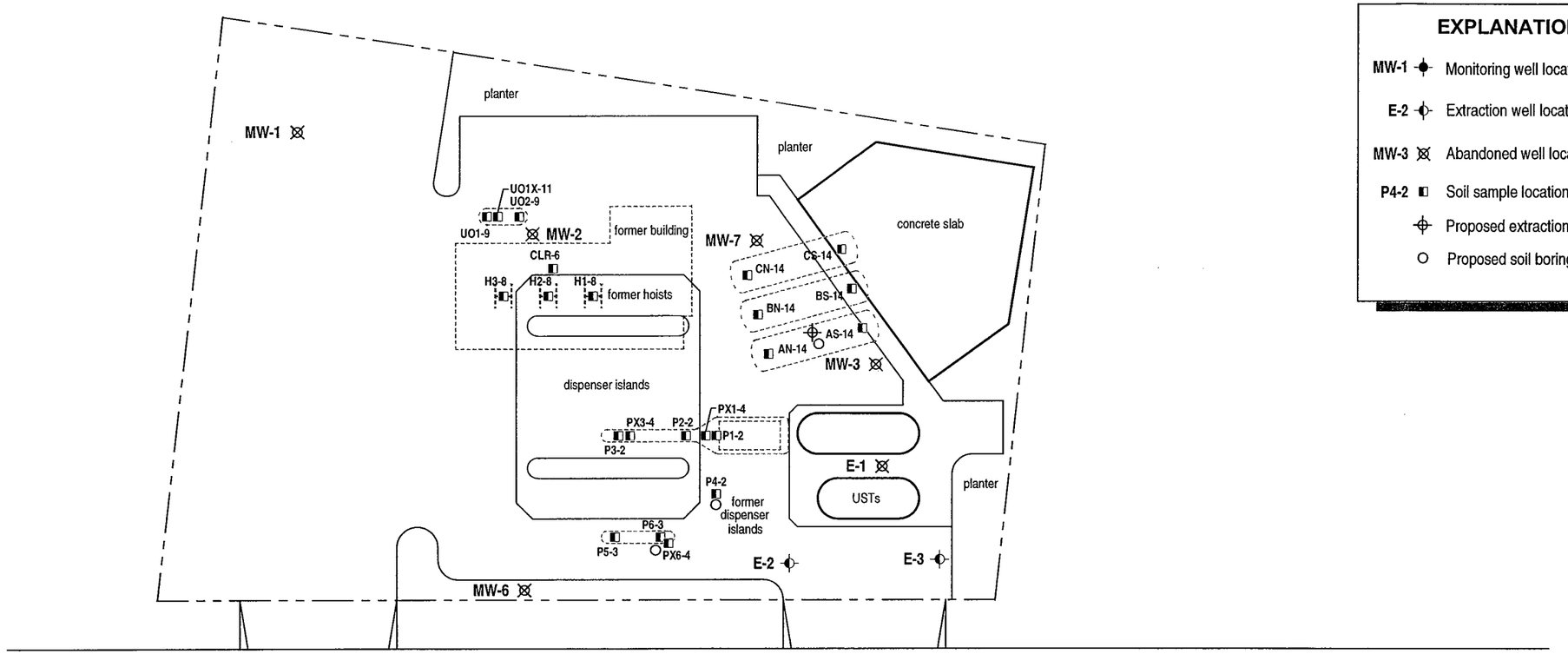
Attachments:
A – ACHCSA November 23, 2005 Letter
B – Standard Field Procedures for Soil Borings and Monitoring Well Installations
C – Ivey-sol® SPTT MSDS

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

R:\9-8139 SAN LEANDRO\9-8139 SAN LEANDRO\REVISED WORKPLAN 5-06.DOC

12/10/03

Site Plan



EXPLANATION

- MW-1 — Monitoring well location
- E-2 — Extraction well location
- MW-3 — Abandoned well location
- P4-2 — Soil sample location
- Proposed extraction well
- Proposed soil boring

0 15 30 60

Scale (ft)

FIGURE

1

Chevron Service Station 9-8139
16304 Foothill Boulevard
San Leandro, California

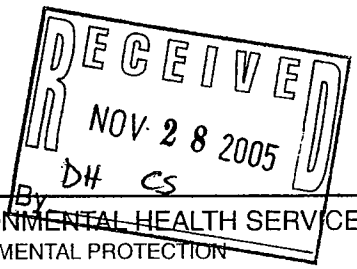
CAMBRIA

I:\9-8139 SAN LEANDRO\FIGURES\SITEPLAN.DWG

ATTACHMENT A

ACHCSA November 23, 2005 Letter

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director



ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

November 23, 2005

Mr. Dana Thurman
Chevron
6001 Bollinger Canyon Rd., K2236
P.O. Box 6012
San Ramon, CA 94583-2324

Dear Mr. Thurman:

Subject: Fuel Leak Case RO0000368, Chevron Station # 9-8139, 16304 Foothill Blvd., San Leandro, CA 94578

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the subject site including the October 17, 2005 *Investigation Workplan* by Cambria. The work plan proposes the installation of one monitoring well in the area of the former USTs. Although we concur with this proposal, we believe additional information is needed to progress toward case closure. We request you address the following technical comments when performing the proposed work and submit the technical report requested below.

TECHNICAL COMMENTS

1. The continued presence of TPHg, MTBE and other oxygenates detected in monitoring/extraction wells indicates a significant residual source exists on-site. It is unclear whether the source is predominantly within the former UST pit and dispenser areas or whether there is additional contribution from the existing USTs. We believe that additional remediation of the residual contamination in groundwater will be needed, therefore, the proposed well within the former tank pit should be enlarged to allow for groundwater extraction. We also request that prior to well installation and construction, the vertical extent of contamination be determined by taking depth discrete soil and groundwater samples. The well should be constructed to target impacted areas detected in your initial sampling. A gravelly sand lens was observed in at least one boring at a depth of 25' bgs, therefore, we recommend your boring be advanced beyond this depth, until the contamination is defined within a competent layer. Please confirm the well's construction design prior to installation. A remediation proposal should be part of your investigation report. If needed, an additional monitoring well of more conventional construction may be proposed down-gradient of the extraction well.

2. Groundwater impacts from the former dispenser areas have not been adequately investigated although elevated MTBE concentrations were detected in soil samples. Therefore, we request that an additional boring be advanced near former dispenser sample P6 for soil and groundwater sampling. Sampling should be based upon what is detected in the samples and the boring/well installation results within the former tank pit.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health, according to the following schedule:

- December 23, 2005- Response and clarification of subsurface investigation.
- 60 days after completion of investigation- Well installation, Soil and groundwater and remediation proposal report.

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) now request submission of reports in electronic form. The electronic copy is intended to replace the need for a paper copy and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the Geotracker database over the Internet. Beginning July 1, 2005, electronic submittal of a complete copy of all reports is required in Geotracker (in PDF format). Please visit the State Water Resources Control Board for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and

recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

If you have any questions, please call me at (510) 567-6765.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: files, D. Drogos
Mr. David Herzog, Cambria Environmental, 4111 Citrus Ave., Suite 12, Rocklin, CA 95677

11_23_05 16304Foothill Blvd

ATTACHMENT B

Standard Field Procedures for Soil Borings and Monitoring Well Installations

STANDARD FIELD PROCEDURES FOR REMEDIATION WELL INSTALLATION

This document presents standard field methods for drilling and sampling soil borings and installing remediation wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORING AND SAMPLING

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 Professional Geologist (PG) or a Certified Engineering Geologist (CEG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or push technologies such as the Geoprobe. Prior to drilling, the first 5 ft of the boring are cleared using an air or water knife and vacuum extraction. This minimizes the potential for impacting utilities.

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 photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

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.

REMEDIATION WELL INSTALLATION

Well Construction

Remediation wells are commonly installed for dual phase extraction (DPE), soil vapor extraction (SVE), groundwater extraction (GWE), oxygenation, air sparging (AS), and vapor monitoring (VM). Well depths and screen lengths will vary depending upon several factors including the intended use of the well, groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines.

Well casing and screen are typically one to four inch diameter 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 ft thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement. Well-heads are typically connected with remediation piping set in traffic-rated vaults finished flush with the ground surface. Typical well screen intervals for each type of well are described below.

DPE Wells: DPE wells are screened in the vadose zone targeting horizons with the highest hydrocarbon concentrations and a few feet into the saturated zone, targeting SPH on or submerged by the water table. A vacuum is applied to the well casing and/or a 'stinger' (a one-inch diameter tube) placed in the well about 1 to 2 feet below the static fluid level. Vacuums can be adjusted to fine tune the performance of the well/system and to optimize the removal of SPH without excessive production of ground water.

SVE Wells: SVE wells are screened in the vadose zone targeting horizons with the highest hydrocarbon concentrations. SVE wells are also occasionally screened as concurrent soil vapor and groundwater extraction wells with screen interval above and below the water table.

GWE Wells: Groundwater extraction wells are typically screened ten to fifteen ft below the first water-bearing zone encountered. The well screen may or may not be screened above the water table depending upon whether the water bearing zone is unconfined or confined.

Oxygenation Wells: Oxygenation wells are installed above or below the water table to supply oxygen and enhance naturally occurring hydrocarbon biodegradation. Oxygenation wells installed in the vadose zone typically have well screens that are two to ten feet long and target horizons with the highest hydrocarbon concentrations. Oxygenation wells installed below the water table typically have a two foot screen interval set ten to fifteen ft below the water table.

AS Wells: Air sparging wells are installed below the water table and typically have a two foot screen interval set ten to fifteen ft below the water table.

VM Wells: Vapor monitoring wells are installed in the vadose zone to check for hydrocarbon vapor migration during air injection. The wells are typically constructed with short screens to target horizons through which hydrocarbon vapor migration could occur. These wells can also be constructed in borings drilled using push technologies such as the Geoprobe by using non-collapsible Teflon tubing set in small sand packed regions overlain by grout.

Well Development

Groundwater extraction 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.

STANDARD FIELD PROCEDURES FOR GEOPROBE® SOIL AND GROUNDWATER SAMPLING

This document describes Cambria Environmental Technology, Inc.'s standard field methods for GeoProbe® soil and groundwater 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, and
- Other significant observations (i.e., cementation, presence of marker horizons, mineralogy)

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 Groundwater Sampling

Groundwater 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.

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ATTACHMENT C

Ivey-sol® SPTT MSDS

Ivey International Inc. MSDS NUMBER: 100764/02

MATERIAL SAFETY DATA SHEET
SELECTIVE PHASE TRANSFER TECHNOLOGY

IVEY-SOL® • Selective Phase Transfer Technology (SPTT®)

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	Ivey-sol/SPTT (Stock Mixtures: SPTT#101-104)
Chemical Name:	Not Applicable (mixture)
Chemical Family:	Non-ionic Surfactant
Formula:	Not Applicable (mixture)
Synonym(s):	Ivey-sol® and SPTT®

COMPANY IDENTIFICATION

Ivey International (USA) Inc.	26 Berkeley Place, Newington, CT USA 06111
Ivey International (CAN) Inc	PO Box 706 Campbell River BC Canada V9W 6J3
Prepared By:	Technical Products Department
Telephone Number:	1-800-246-2744 (Emergency Also)
Prepared:	April 2005 (Last Updated)

Ivey International Inc. (III) urges each customer or receipt of this MSDS to study it carefully to become aware of and understand the proper use and handling of the subject product. The reader should consider consulting reference materials, and/or III technical support personal, and/or other recognized experts, as necessary or appropriate to the use and understanding of the data contained in this MSDS. To promote the safe handling, storage and use of this product, each customer or recipient should (1) notify his employees, agents, contractors, and others whom he knows or believes will use this product, of the information in this MSDS and any other information regarding product use, storage and handling, (2) furnish this same information to each of his customers for the product, and (3) request his customers to notify their employees, customers, and other users of the product, and of this information.

SECTION 2: COMPOSITION INFORMATION

Components:	
Ivey-sol 101	3% (By-volume)
Ivey-sol 102	3% (By-volume)
Ivey-sol 103	3% (By-volume)
Ivey-sol 104	3% (By-volume)

Ivey-sol® / SPT® Technology - Stock Mixtures. Patented and or proprietary blends. Information in this MSDS is applicable for all component products listed.

SECTION 3: HAZARDS IDENTIFICATION

Effects Of A Single Exposure	
Swallowing:	Slightly toxic. May cause abdominal discomfort, nausea, vomiting, and diarrhea.
Skin Absorption:	No evidence of harmful effects from available information.
Inhalation:	No evidence of harmful effects from available information.
Skin Contact:	Brief contact should result in not significant effects. Prolong exposure may cause mild irritation with local itching and redness.
Eye Contact:	May cause mild to moderate irritation, experienced as discomfort or pain.
Effects Of Repeated Exposure:	Repeated skin contact may cause mild dermatitis.
Medical Conditions:	Existing dermatitis may be aggravated through repeated skin contact.
Other Effects:	None currently known.

Section 4: FIRST AID MEASURES

Swallowing:	If patient if fully conscious, give two glasses of water
Skin Absorption:	Wash with soap and water. Obtain medical attention if irritation or dermatitis persists. Wash any exposed clothing before reuse.
Inhalation:	Not applicable.
Eye Contact:	Immediately flush eyes with water and continue to flush as required. Remove any contact lenses, if worn. Obtain medical attention if deemed necessary
Note To Physician:	There is no antidote. Treatment should be directed tat the control of symptoms and the clinical condition of the patient.

Section 5: FIRE FIGHTER MEASURES

Flammability:	Not Flammable.	
Auto Ignition Temp.	Not Available	
Upper Flammable Limit	Not Established	
Lower Flammable Limit	Not Established	
Explosive Date:	Explosive Power	Not Available
	Rate Of Burning	Not Available.

Hazardous Combustion Products:	Burning can produce the following combustion products: Carbon monoxide, and/or Carbon Dioxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide is sufficient concentrations can act as an asphyxiant.
Special Protective Equipment:	Use self contained breathing apparatus and protective clothing.
Extinguishing Media:	Apply alcohol type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use water spray, carbon dioxide, or dry chemical for small fires.
Extinguishing Media To Be Avoided:	None.
Special Fire Fighting Procedures:	Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.

Section 6: ACCIDENTAL RELEASE MEASURES

Step To Be Taken If Material Is Released or Spilled:	Eliminate and/or contain source with inert material (sand, earth, absorbent pads, etc.). Wear eye and skin protective. Floor may be slippery; use care to avoid falling. Avoid discharge to natural waters. Transfer liquids and solid dyking material to suitable containers for recovery or disposal. Contact III for technical assistance if required.

Section 7: HANDLING AND STORAGE

Handling Procedures:	Avoid contact with eyes, skin, and clothing. Do not swallow. Keep containers closed or sealed when not in use. Wash thoroughly after handling.
Storage:	Keep closed or sealed when not in use. Do not allow to freeze.
Ventilation:	General (mechanical) room ventilation is expected to be satisfactory.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Gloves / Type Gloves / Type:	Latex would be sufficient.
Respiratory / Type:	None expected to be needed. However, if an engineered / industrial application where vapors and/or misting may occur, wear MSHA/NIOSH approved half mask air purifying respirator.
Eye / Type:	Mono Goggles
Footwear / Type:	No special requirements.
Clothing / Type:	Wear an apron and /or coveralls.
Other / Type:	Eye bath.
Engineering Controls:	General (mechanical) room ventilation is expected to be satisfactory.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Appearance:	Transparent
Odor:	Mild
Molecular Weight:	Mixture (Not Applicable)
Boiling Point:	260 C (Average At 760 mm Hg)
Freezing Pint:	Not Applicable
Pour Point:	Not Applicable
Melting Point:	Not Applicable
Specific Gravity:	0.99-1.04 (Water = 1.0)
Vapor Pressure:	<0.01 mm Hg
Vapor Density:	> 1 (Air = 1.00)
Ph:	Not Available
Solubility In Water:	100%
Evaporation Rate:	<0.01
Coefficient of Oil/Water Distribution	Not Determined

Section 10: STABILITY AND REACTIVITY

Stability:	Stable
Conditions To Avoid:	Prolonged excessive heat may cause product decomposition. Freezing should also be avoided as it may cause product decomposition.
Incompatible Materials:	Normally un-reactive; however avoid strong bases at high temperatures, strong acids, strong oxidizing agents, and materials with reactive hydroxyl compounds.
Hazardous Decomposition Products:	Burning may produce carbon monoxide and/or carbon dioxide.
Hazardous Polymerization:	Will not occur.

Section 11: TOXICOLOGICAL INFORMATION

Exposure Limit of Material:	Not Established	
LD/50:	48 Hour: 0.11 %,	Species: Daphnia magna
	96 Hour: 0.07695%	Species: Daphnia magna
LC/50:	Not Available	(Route Species)
EL:	Not Established	
Carcinogenicity of Material:	None Known	
Reproductive Effects:	Not Available.	
Irritancy of Material:	See Section 3	
Sensitizing Capability:	Not Available	
Synergistic Materials:	Not Available	

LD: Lethal Dose LC: Lethal Concentration EL: Exposure Limit

Section 12: ECOLOGICAL CONSIDERATIONS

Environmental Toxicity:	Low Potential to affect aquatic organisms*
Biodegradability:	>90% in 28 days**

* When used in accordance with Ivey International Inc. In-situ and Ex-situ Remediation Application Guidelines.

** Based on actual testing or on data for similar material(s). Degradation Biodegradation reached in Modified OECD Screening Test (OECD Test No.301 E) after 28 days: 90 %. Biodegradation reached in CO2 Evolution Test (Modified Sturm Test, OECD Test No. 301 B) after 28 days: 70 %.

All available ecological data have been taken into account for the development of the hazard and precautionary information contained in this Material safety data Sheet.

Section 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: For aqueous Ivey-sol mixture solutions; aerobic biological wastewater treatment systems are effective in treating said mixtures.

Disposal methods identified are for the product as sold. For proper disposal of used materials, an assessment may be required to determine the proper and permissible waste management option permissible under applicable rules, regulations, and/or laws.

Section 14: TRANSPORTATION INFORMATION

UN Number:	Not Applicable
TDG Classification:	Not Required
Shipping Name:	Selective Phase Transfer Mixture (Ivey-sol)
Packing Group:	Not Applicable
Special Shipping Instructions:	Do not allow to freeze

Section 15: REGULATORY INFORMATION

WHMIS Classification:	D2B
CPR Compliance:	This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

Section 16: OTHER INFORMATION

Available Literature and Brochures: Additional information on this product may be obtained by calling our customer service representative.

Recommended Uses and restrictions: For the application of air, soil, groundwater, shoreline, and off-shore spill petroleum reclamations purposes. Secondary recoveries of petroleum products form crude-oil, oil-shale, and oil-sands. Additional information on uses can be made available by contacting out technical sales director.

Legend:

TS	- Trade Secret
D2B	- Toxic Material causing Other Effects.
<	- Less Than
mm	- Millimeters
LD	- Lethal Dose
LC	- Lethal Concentration
EL	- Exposure Limit
Hg	- Mercury (760 mm Hg = 1 Atmosphere, Sea Level)

Notes:

i) Revised Sections In This Issue: Section 5: Fire-Fighter Measures
Section 8: Latex Gloves Sufficient
Section 1: Trade Mark Registrations ®

REF:C:Ivey-sol/MSDS(April 2005)