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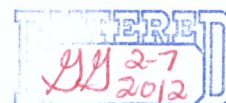
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**SOIL BORING AND SOIL VAPOR PROBE INSTALLATION
AND SAMPLING WORK PLAN
76 PRODUCTS FACILITY No. 351448
200 South 36th Street
Bellingham, Washington**

January 24, 2012

**Prepared for:
Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, California 94583**

**Prepared by:
SAIC Energy, Environment & Infrastructure, LLC
405 South 8th Street, Suite 301
Boise, Idaho 83702**



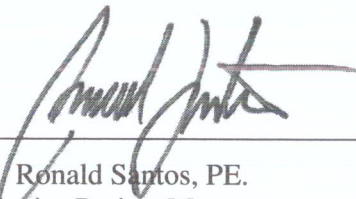
SAIC

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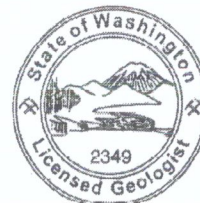
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Figure 1. Site Plan with Proposed Soil Boring and Soil Vapor Points Locations

1. INTRODUCTION

On behalf of Chevron Environmental Management Company, for itself and as Attorney-in-Fact for Union Oil Company of California (EMC); SAIC Energy, Environment, & Infrastructure, LLC (SAIC) prepared this work plan describing proposed soil boring, and soil vapor probe installation and sampling activities to be performed at 76 Products Facility No. 351448 located at 200 South 36th Street in Bellingham, Washington (Figure 1).

It is anticipated that the site will be redeveloped with a restaurant as shown in Figure 1. The current site surface and subsurface features will be removed prior to construction. The objective of the activities described in this workplan is to evaluate the presence or absence of hydrocarbons in shallow soil and evaluate the potential intrusion of petroleum hydrocarbon vapors to indoor air for a future occupational exposure pathway scenario.

1.1 SITE LOCATION AND DESCRIPTION

The subject property is currently owned by SYB Holdings, Inc. and is a 76-branded station with a convenience store. Bordering the property are to the north Bill McDonald Pkwy and a restaurant across the street, to the northeast intersection of Bill McDonald Pkwy and Samish Way and retail stores across the intersection, to the east Samish Way and a restaurant across the street, and to the south and west a shopping mall with a parking lot. The site encompasses an area of approximately 0.45 acres, and is mostly covered by buildings and asphalt.

The site was developed as a gasoline service station in 1965. Unocal operated the site beginning in 1972. Tosco Marketing Company purchased the property in 1997 and operated it until 2002, when it was sold to the current owner. The site features consist of a service building located in the central portion of the site, a shed located south of the building, a pump island with four dispensers and associated product piping located east of the building, and two 12,000-gallon gasoline underground storage tanks (USTs) located northwest of the building. The original two 5,000-gallon gasoline USTs and one 8,000-gallon gasoline UST were replaced in 1984. Product piping was replaced with fiberglass product lines in 1981. One of the hoists, located in the south portion of the service building, was replaced in 1985 because of a hydraulic oil leak. A shallow oil/water separator inside the station building was sealed with gravel and concrete in 1989. A 500-gallon waste oil UST and a 500-gallon heating oil UST located close to the building's west wall were removed from the site in 1998 (Figure 1).

1.2 PHYSICAL FEATURES, GEOLOGY, AND HYDROGEOLOGY

The site is located approximately 1.3 miles east of the Bellingham Bay at an elevation of approximately 200 feet (ft) above mean sea level. Topography of the immediate area is relatively flat. Based on November 2011 groundwater gauging data, the inferred direction of groundwater flow is to the northwest at a gradient of approximately 0.007 to 0.013 feet per foot; however, a southerly flow gradient exists in the southeast portion of the property as well. Groundwater is present at depths ranging from 4 to 9.3 feet below ground surface (bgs).

Based on subsurface investigations conducted at the site, sands and silty sands underlain by clay at a total depth explored of 27 feet bgs.

1.3 BACKGROUND

Detailed history of environmental activities completed at the site between 1995 and 2006 was provided in the previous *Subsurface Investigation* report [Secor International Incorporated (Secor), 2006].

Groundwater monitoring and sampling activities have been conducted on a semi-annual or quarterly basis since March 1999.

2. SCOPE OF WORK

2.1 PRE-FIELD ACTIVITIES

To evaluate the presence or absence of hydrocarbons in shallow soil, and evaluate the potential intrusion of petroleum hydrocarbon vapors to the indoor air for future occupational exposure pathway scenario, site and vapor assessment activities will be conducted. Twenty onsite soil borings will be completed and at least six (6) of the borings will be converted to soil vapor sampling points at locations within the proposed building footprint. The proposed soil boring and soil vapor point locations are presented on Figure 1.

Prior to beginning any fieldwork, SAIC will obtain any necessary permits and authorizations from the City of Bellingham and the current site property owner. A private utility locator will be contracted to survey each boring location for underground utilities, and the Utility Notification Center will be contacted at least 72 hours before field activities.

SAIC will conduct a “tailgate” safety meeting at the beginning of each field day to discuss pertinent health and safety issues. A site-specific health and safety plan (HASP) will be prepared in accordance with the Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1910.120. In addition, a site-specific Journey Management Plan (JMP) will also be prepared.

2.2 SOIL BORING AND VAPOR PROBE INSTALLATIONS

The scope of work includes advancing twenty onsite soil borings and completing six (6) of these borings as soil vapor sampling points. Soil borings will be advanced to a depth of 5 ft bgs using a hand auger.

Once each vapor probe location (SV-1 through SV-6) has been advanced to its maximum depth of approximately 5 feet bgs, a soil vapor sampling probe consisting of a 6-inch long by 0.75-inch diameter stainless steel screen with a pore diameter of 0.0057 inch will be installed. The screened section of each vapor sampling probe will be capped on one end and fitted with a Swagelok® fitting connected on the other end. A length of 0.25-inch outer diameter Teflon® or nylon (Nylaflo®) tubing will be attached to the probe. Prior to installation of one of the vapor sampling probes, an air equipment blank sample will be collected (see Section 2.4).

Each 6-inch long screen tip will be vertically centered in a 1-foot long interval containing standard sand pack, resulting in 3 inches of sand being above and below the screen. Each sand pack will be covered with a 1-foot interval of dry granular bentonite, which is then covered with greater than 2 ft of hydrated granular bentonite slurry. The dry granular bentonite is emplaced immediately above the sand pack to ensure that hydrated granular bentonite slurry does not flow down to the probe screen and seal it off from the adjacent soil. The remainder of the borehole will be filled with hydrated granular bentonite slurry (mixed at the surface and poured in), and

the boring seal and the surface will be completed with a 1-foot thick cement cap. A 12-inch flush-mounted well box will be installed to protect the tubing line that is set in the cement cap.

Once each of the soil boring location (B-1 through B-14) has been advanced to its maximum depth and samples have been collected, the borings will be backfilled with hydrated bentonite chips and Portland cement.

2.3 SOIL SAMPLE COLLECTION AND ANALYSIS

During boring advancement, soil samples will be collected at 2 and 5 feet bgs and field screened (using FID readings and field observations) for evidence of petroleum hydrocarbons. Select borings (B-2 and SV-3) may be completed at greater depths if field observations indicate hydrocarbons are present. The maximum depth in the vicinity of the dispensers will be 14 feet bgs. Under the supervision of a state-registered engineer or geologist, soils encountered during the soil boring activities will be classified and logged in the field by an SAIC field technician using ASTM D 2488 *Standard Practice for Description and Identification of Soils* (Visual-Manual Procedure). Soil samples collected for VOC analysis will be field preserved according to United States (U.S.) Environmental Protection Agency (EPA) Method 5035.

Soil samples will be shipped to Lancaster Laboratories of Lancaster, Pennsylvania. Based on field screening results, a minimum of two soil samples per boring will be analyzed for constituents listed in Table 830.1 "Required Testing for Petroleum Release" in Ecology's MTCA Cleanup Regulation including as follows:

- TPH-G using Northwest Method NWTPH-Gx.
- TPH-D and TPH-O using Northwest Method NWTPH-Dx.
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8260B.

Select samples (B-2, SV-3, and B-13) will be analyzed for the following:

- BTEX, methyl tertiary-butyl ether (MTBE), ethylene dibromide (EDB), ethylene dichloride (EDC), and naphthalenes (naphthalene, 1-methyl, and 2-methyl) using EPA Method 8260B.
- Extractable petroleum hydrocarbons (EPH) and volatile petroleum hydrocarbons (VPH) using Washington EPH and VPH Methods, respectively.
- Total lead by EPA Method 6010B.

The proposed soil sampling locations are presented on Figure 1. Soil borings will be advanced in the following areas:

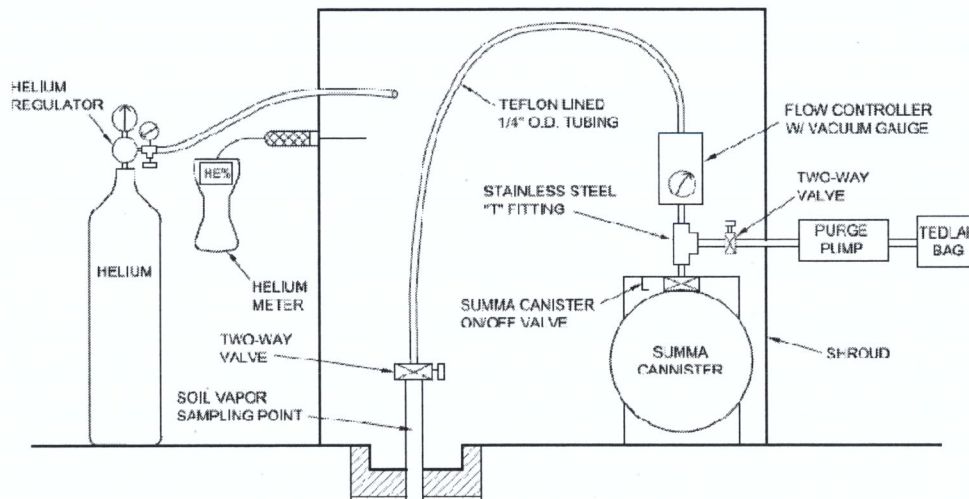
- B-1 through B-3 within the footprint of the proposed building;
- B-4 through B-6 east of the proposed building,
- B-7 and B-8 north of the proposed building,
- B-9 through B-11 west of the proposed building in close proximity to the USTs, and
- B-12 through B-14 to the south of the current and proposed buildings.

The locations have been selected based on the historical analytical soil data and to laterally define hydrocarbon-affected soils across the site. Based on field observations additional soil boring locations may be completed as soil vapor points.

2.4 SOIL GAS SAMPLING

Once the soil probes are installed, and the concrete well seal at each vapor point has fully cured, vapor sampling activities will commence (minimum of 48 hours). Sampling will not be conducted during or immediately after a significant rain event due to the reduced effective diffusion coefficient and decrease in relative vapor saturation in the unsaturated zone. If rain is encountered prior to sampling, the event will be postponed at least 24 hours. Written documentation will be kept of field conditions including temperature, barometric pressure, wind direction and speed, humidity, and surface soil conditions. Records will also be kept of names of field personnel, dates and times of sampling, purge volumes and purge rate, sampling volume, and leak testing description. Below is a figure depicting the sampling equipment set-up.

Example of Typical Sampling Train



Once the soil probes have equilibrated for at least 48 hours, the soil gas sampling equipment will be setup and two volumes will be purged. Purging will be completed using a Summa® canister, graduated syringe, or battery powered flow-calibrated pump. The maximum flow rate during purging will not exceed the flow rate limit used for subsequent sampling (less than 200 milliliters per minute [ml/min]), and care will be taken not to over purge.

After the sampling train has been purged, soil gas samples will be collected over a 30 minute period at a flow rate of less than 200 ml/min. Soil vapor samples will be collected in 100-percent certified and pre-evacuated 1 liter Summa® canisters supplied by Air Toxics Laboratories of Folsom, California. Each Summa® canister will be supplied with an analytical test report certifying the canister is "clean" to concentrations below the respective method recording limits (MRLs). Each canister will be equipped with a pre-calibrated flow controller sampling train to allow collection of the desired sample. The sampling train will be checked for leaks by capping the timers, then turning the canister valve on and off momentarily. If the sampling train maintains vacuum for 5 minutes, the equipment will be assumed to be functional.

Prior to collecting the samples, the Summa® canister ID numbers will be recorded in the field notebook along with the initial canister vacuums.

Soil vapor samples will be collected per the following steps: (1) Begin sampling by opening the valve on the top of the Summa® canister and record the time in the log book; (2) As the canister fills, observe the pressure gauge on the sampling train to ensure that the vacuum in the canister is decreasing over time. If the sampling train is working correctly, the planned sampling completion time will be reached when the pressure has decreased to approximately 5 inches of mercury (in. Hg). To ensure sufficient sample volume to achieve data quality objectives, the Summa® canisters should be filled until no more than 5.5 in. Hg is observed on the canister.

Once the sampling period is completed, the inlet valve on the canister will be closed, the final vacuum will be recorded, the sampling train will be removed from the canister, a Swagelok® cap will be tightly fitted to the inlet port of the canister, and the canister will be packaged for shipping and sent to the laboratory under chain of custody protocol. Chain of custody will be maintained and documented at all times, including sealing the shipping container with chain of custody seals.

Soil gas samples will be submitted to Air Toxics, Inc. in Folsom, California and analyzed for the following:

- A calculation of estimated TPH-G concentrations will be made by the laboratory based on the EPA Method TO-15 analysis;
- BTEX, ethylene dibromide (EDB), and naphthalenes (naphthalene, 1-methyl, and 2-methyl) using EPA Method TO-15;
- Oxygen, methane, nitrogen, and carbon dioxide using ASTM D 1946; and
- Helium using ASTM D 1945 for the leak test.

The proposed soil gas sampling locations are presented on Figure 1. As described above, samples from six (6) soil vapor probes will be collected, along with a duplicate from SV-3. In addition, an equipment field blank will be collected at the site during sampling activities by collecting a sample of clean air or nitrogen through the probe materials before installation in the ground. The vapor sampling locations are summarized below.

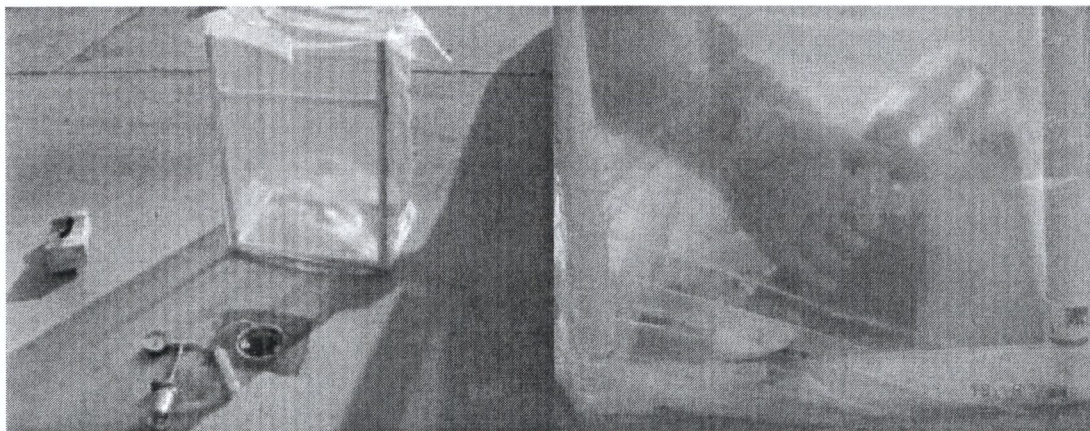
Location	Description	No. of Containers	Sample Duration (minutes)	Sample Container
SV-1	S of the USTs; within proposed building footprint	1	30	1 liter Summa
SV-2	N of pump island, within proposed building footprint	1	30	1 liter Summa
SV-3	Between dispensers; within proposed building footprint	1	30	1 liter Summa

SV-3 DUP	Duplicate Sample of SV-3	1	30	1 liter Summa
SV-4	S of pump island; within proposed building footprint	1	30	1 liter Summa
SV-5	SW of pump island; within proposed building footprint	1	30	1 liter Summa
SV-6	W of the current building	1	30	1 liter Summa
Equipment Blank	Sample probe materials before installation	1	30	1 liter Summa

2.5 EVALUATION OF POTENTIAL LEAKS IN THE SAMPLING TRAIN

In addition to soil gas sampling activities, leak testing will be performed at all sampling locations. Leak testing will be performed using the following soil gas sampling set-up procedures: A large plastic bag will be sealed around the Summa® canister, sampling apparatus, and vapor probe. A small hole will be cut in the bag to allow tubing to be inserted through it to introduce helium and to subsequently fill the plastic bag. Detections of helium in the soil gas samples will indicate that the canister, valves or connection to the sample probe have potentially leaked ambient air into the sample. In addition, prior to sampling, a helium detector will be used to determine if there is a leakage in the sampling train. Below is a picture showing the leak test apparatus.

Helium Shroud Pictures



2.6 CONSTITUENTS OF INTEREST EVALUATION

Results of laboratory analyses will be evaluated to confirm if there are complete vapor intrusion pathways to future occupational receptors for the proposed future site use.

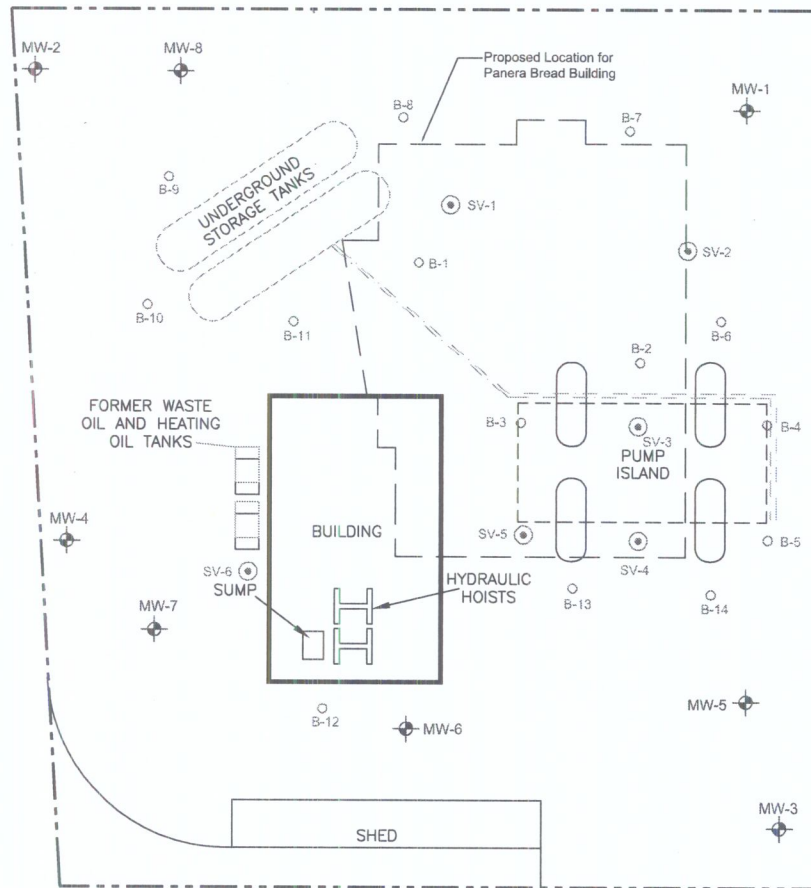
2.7 REPORT PREPARATION

A report will be prepared and submitted to property owner and Ecology that will include a site description, background information, description of assessment activities, figures, laboratory results, analytical report, discussion and evaluation of results, and conclusions and recommendations, if warranted.

Figure

SAIC.

BILL McDONALD PARKWAY



LEGEND

- MW-1 Monitoring Well Location
- - - Site Boundary
- B-1 Proposed Soil Boring Location
- SV-1 Proposed Soil Vapor Point Location



NOTE: Features were adapted from a Stantec Corporation figure, *Site Map with Analytical Results (June 4, 2010)*, dated June 17, 2010.

76 Products Facility No. 351448
 200 South 36th Street
 Bellingham, Washington

FIGURE 1
 Site Plan with Soil Boring and
 Soil Vapor Point Locations

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