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Alameda County
Environmental Health

April 25, 2012

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Re: Terradev Jefferson LLC Property
645 Fourth Street, Oakland, CA 94607
Fuel Leak Case No. RO0003001
Blue Rock Project No. ASE-1

Dear Mr. Wickham,

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.

Sincerely,

Sara May
Director of Operations
Metrovation, LLC, managing agent for
Terradev Jefferson, LLC

Attachment:

Blue Rock Environmental, Inc.'s
Sub-Slab Soil Vapor Sampling Workplan and Project Schedule dated April 25, 2012

OAKLAND IRONWORKS BUILDING

580 SECOND STREET, SUITE 260, OAKLAND CA 94607 TELEPHONE (510) 839-4000 FAX (510) 465-4472

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

April 23, 2012

Re: Sub-Slab Soil Vapor Sampling Workplan and Project Schedule
Terradev Jefferson LLC Property
645 4th Street, Oakland, CA 94607
Fuel Leak Case No. RO0003001
Blue Rock Project No. ASE-1

Dear Mr. Wickham,

This workplan was prepared by Blue Rock Environmental, Inc. (Blue Rock), on behalf of Terradev Jefferson, LLC, for the site at 645 4th Street, Oakland, California (site) (Figure 1). This workplan was requested in the Alameda County Health Care Services Agency – Environmental Health Services (ACHCSA) in a letter dated March 22, 2012.

Background

Site Description and UST History

The site is located southeast of the intersection of 4th Street and Martin Luther King Jr. Way in Oakland, California (Figure 1). The site consists of a single story commercial building, bounded closely on the sides and back by other commercial buildings. One single-walled steel underground storage tank (UST) was discovered beneath the sidewalk immediately adjacent to the front of the building during renovation in 2006. The UST is located on the upgradient edge of a developed city block.

In their *Tank Closure Report* dated September 21, 2006, Golden Gate Tank Removal, Inc. (GGT) reported that the UST contained gasoline with an approximate holding capacity of 1,000-gallons, measuring approximately 10 feet in length and 4 feet in diameter. The bottom of the UST was estimated to be located 7.5 to 8 feet below ground surface (ft bgs). The fill port was reported to be located at the west end of the tank (Figure 2).

GGT abandoned the UST in place by triple washing followed by filling to capacity with concrete slurry because of structural considerations due to the proximity of the UST to the building foundation. Abandonment was performed with the permission and under the oversight of the City of Oakland Fire Prevention Bureau.

Two soil samples were collected from below the UST at a depth of 9 ft bgs during abandonment activities. Both samples contained elevated concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and xylenes (BTEX); however, TPH as diesel (TPHd) and the five fuel oxygenates MTBE, TBA, ETBE, DIPE, and TAME were not detected (Table 2). No groundwater was encountered during abandonment activities, though the soil samples collected beneath the tank were reported as "wet".

<u>Summary of Investigation Activities</u>

Subsurface investigation began in 2009. A total of two soil borings have been drilled (B-1 and B-2) and three extraction wells have been installed (DPE-1 through DPE-3) at the site. A summary of well construction details is included in Table 1, and summaries of soil and groundwater sample analytical data are included in Tables 2 and 3, respectively.

In 2009, Ninyo & Moore Geotechnical and Environmental Sciences Consultants (Ninyo & Moore) completed a limited subsurface investigation, the findings of which were presented in their *Limited Phase II Environmental Site Assessment* dated July 24, 2009. Two borings (B-1 and B-2) were advanced on each side of the UST by direct push drilling methods to a depth of 20 ft bgs. No soil samples were submitted for laboratory analysis; however, soil samples were screened in the field with a photo-ionization detector (PID) meter. In B-1, PID readings increased with depth to a maximum of 1,422 parts per million (ppm) at 9 ft bgs, and attenuated below that depth. Temporary wells were built in each boring, in which groundwater stabilized at a depth of approximately 9.6 ft bgs and was sampled. Concentrations of TPHd, TPHg, BTEX, and MTBE were present in groundwater samples collected from both borings (Table 3), although TPHg levels were an order of magnitude greater than TPHd levels suggesting the former is the primary hydrocarbon range of interest at the site.

In 2010, Blue Rock supervised the installation of three extraction wells (DPE-1 through DPE-3). Wells DPE-1 and DPE-2 were installed on either side of the UST proximal to former borings B-1 or B-2, respectively. Well DPE-3 was installed on the north side of the UST. All eight soil samples collected from these locations contained varying concentrations of gasoline range hydrocarbons, and diesel range hydrocarbons to a lesser degree. The maximum TPHg concentration (160,000 mg/kg) in soil was detected in the sample from DPE-2 at 11 ft bgs. Water samples collected from the wells contained elevated concentrations of dissolved-phase gasoline hydrocarbons. The maximum TPHg concentration (120,000 μg/L) in groundwater was detected in the sample from DPE-1.

During the January 2011 groundwater monitoring event, light non-aqueous phase liquid (LNAPL) petroleum was observed in DPE-3 at a thickness of 0.13-ft.

Site Conceptual Model

The site conceptual model for the project was initially developed by Amicus in their September 13, 2009 correspondence. The following section presents a summary of the current site conceptual model, which will be modified as new information regarding site conditions is acquired.

The subject site is located in a commercial/industrial neighborhood along the San Francisco Bay-Margin. The site is underlain by sediments characterized as silty and clayey sand with some layers of sandy clay and sand to a depth of 20 ft bgs (the maximum depth previously explored) and groundwater is present in unconfined conditions at a depth of approximately 9 ft bgs. Groundwater flows generally to the southeast, towards the estuary, based on information from nearby sites.

Gasoline range hydrocarbons are present in soil and groundwater proximal to the abandoned UST. Interestingly, the contaminant signature also includes MTBE, a gasoline additive not used abundantly in California until the early/mid 1990s (MTBE became a mandated addition to California gasoline following passage of the Clean Air Act Amendments in 1990). Although it is uncertain when the subject UST was removed from service, it is expected that it was not in service during MTBE's lifespan as a gasoline additive.

The abandoned UST is located beneath the sidewalk along 4th Street, at the upgradient edge of a city block. The location of densely packed, low ceiling (occupied) buildings prohibits implementation of a traditional environmental investigation (i.e. an array of downgradient borings and wells). The nearest location for the construction of downgradient monitoring wells is the street or sidewalk along 3rd Street, on the other side of the city block. Review of the results of UST studies at nearby sites (Allen property at 345 Martin Luther King Jr. Way and Markus Hardware at 632-638 Second Street) suggest that a 3rd Street location for downgradient monitoring wells for would simply be too far from the expected downgradient edge of the plume to serve any practical purpose. Yet, the results of corrective action at nearby sites can be used to predict aspects of the subject case.

The Allen property, located across Martin Luther King Jr. Way (formerly Grove Street), provides a useful example. Contamination originating from a 10,000-gallon UST at that property extended approximately 75 feet downgradient. According to Allen property reports, a 10,000-gallon UST was used at that property to fuel fleet vehicles prior to its in-place abandonment. Available reports do not describe the installation date, throughput, or contents of the tank; however, the analytes detected in proximal groundwater suggest the tank may have held gasoline. It is notable that the UST at the subject site is much smaller than the Allen UST, and not obviously associated with a business employing a fleet of delivery trucks (implying a possibly lower throughput). Consequently, a conservative approximation of Terradev migratory extent may be the extent of migration of the Allen release (i.e. approximately 75 feet downgradient of the UST). This approximation is clearly far from the 3rd Street edge of the developed block, which is approximately 235 feet downgradient of the UST. Groundwater beneath this area of Oakland is not presently used for beneficial purposes (consumption or irrigation). Additionally, it is reasonable to assume that the shallowest water-bearing zone in the vicinity of the subject site will plausibly not be used for beneficial consumption for the indeterminate future, if ever (in terms of City habitation). The residual hydrocarbons in groundwater do not, therefore, pose a threat to human health via consumption. Residual hydrocarbons in soil and groundwater may represent an exposure risk to construction or utility workers, and serve as a source for vapor intrusion of adjacent buildings.

Blue Rock understands that an upgradient property at the corner of 5th Street and Martin Luther King Jr. Way was formerly used as a gas station, the tanks for which were removed many years ago under Alameda County oversight. Additional data is not currently available to evaluate if the downgradient extent of any impact from that property has encroached onto the subject site.

Recommended Source Area Remediation

Amicus evaluated investigative and remedial options available at the site in the September 13, 2009 correspondence. It was noted that corrective actions would be necessarily constrained by the location of the abandoned UST relative to existing development - i.e. assessment proximally downgradient is prohibited, inadequate space to build a traditional fixed in-situ remediation system, and remedial excavation would undermine the existing building. Yet the persistence of elevated concentrations of gasoline range hydrocarbons in the subsurface merit remedial action. As a result, the use of mobile high-vacuum extraction (HVDPE) equipment was recommended as an aggressive approach to reduce the remaining gasoline mass in the vicinity of the UST for which details were proposed in the *Removal Action Workplan* dated February 3, 2010, which was conditionally approved by the ACHCSA in a letter dated February 19, 2010. The plan called for the installation of three wells proximal to the former UST to serve as both extraction and source area monitoring points to be sampled before and after a five-day HVDPE event.

High-Vacuum Dual-Phase Extraction Event (September-October 2010)

A five-day mobile HVDPE remedial event was performed at the site from September 28 to October 3, 2010. The event was completed using a truck-mounted unit consisting of a 25-horsepower oil sealed liquid-ring pump capable of producing 29 "Hg vacuum, and a thermal oxidizer capable of treating an air flow of approximately 450 ACFM. Wells DPE-1, DPE-2, and DPE-3 were used as extraction wells. A stinger hose was lowered into each well through a vacuum tight cap and placed approximately one foot off the bottom of each well. Depth to water at the beginning of the event was approximately 9.5 ft bgs in all three wells. At the beginning of the event, influent TPHg levels at individual wells ranged from 1,700 ppmv to 3,530 ppmv; however, they dropped to less 1,000 ppmv by the end of the event.

The total average hydrocarbon mass recovered was **174 lbs** (based on 122 lbs calculated from field PID data and 225 lbs calculated from lab data), which equates to an average extraction rate of nearly 35 lbs/day. A total of approximately 7,950 gallons of water were produced by the HVDPE remedial event, which were transported to the Seaport Environmental facility in Redwood City, California for disposal. The average water production rate was ~1.1 gpm.

Workplan for Sub-Slab Soil Vapor Sampling

Purpose and Scope

The proposed site activities described below are designed to comply with the scope of work requested in the ACHCSA letter dated March 22, 2012. In that letter, the ACHCSA requested sampling of sub-slab soil vapor in locations within the building adjacent to and downgradient of the closed UST.

Proposed Sub-Slab Soil Vapor Point Locations

Blue Rock proposes to install three sub-slab soil vapor points at the site: VP-1, VP-2, and VP-3 (Figure 2). Soil vapor point VP-1 will be located adjacent to the closed UST – approximately 12 feet south of the UST. This vapor point will be representative of source area conditions. Soil vapor points VP-2 and VP-3 approximately 40 feet south-southwest and south-southeast of the closed UST, and these locations will be representative of conditions further downgradient of the UST. All proposed points are located within buildings currently occupied by commercial tenants. It is expected that all vapor point installation and sampling activities will occur on the weekends, so as to minimize disruption to the tenants' businesses.

Proposed Drilling and Soil Vapor Point Installation

Prior to vapor point installation, permits will be obtained from the Alameda County Public Works Agency (ACPWA), as needed, and the site will be marked by Underground Service Alert to identify utilities leading to the site. A private utility locator may be used to further clear exact drilling locations. Blue Rock and drilling personnel will review and sign a Site Safety Plan.

The location of each vapor point will be cleared of flooring material (i.e. carpet) and the concrete slab will be cored to approximately 1 to 1.25-inches diameter. The hole will extend approximately 3 to 4 inches into the sub-slab material. A vapor probe will be constructed in each hole with the following general specifications:

Vapor probes are typically constructed of 1/8 inch or 1/4 inch diameter brass or stainless steel pipe, with a permeable probe tip. A Teflon™ sealing disk is typically placed between the probe tip and the blank pipe. Bentonite chips are typically used to fill the borehole annular space between the probe pipe and sub-slab gravel from the Teflon sealing disk to the base of the concrete foundation. Sufficient water is added to hydrate the bentonite to insure proper sealing, and care is taken in placement of the bentonite to prevent post-emplacement expansion which might compromise both the probe and cement seal. If needed, the vapor probe tip is covered with sand. The probe pipe is tightly sealed to the foundation slab with quick-setting contaminant-free Portland cement. Each probe is constructed with a recessed threaded cap with a brass or stainless steel threaded fitting or compression fitting so the probe completion is flush with the foundation slab to reduce the tripping hazard. An example of a sampling probe is shown in the attached schematic diagram.

Sub-Slab Soil Vapor Point Equilibration Time

The installation of soil vapor sampling points can introduce atmospheric levels of air into soil around the borehole. In order to allow for the subsurface to re-equilibrate to pre-drilling conditions, Blue Rock will sample the vapor points no earlier than 72 hours after installation.

Precipitation Conditions Suitable for Vapor Point Sampling

Sub-slab Soil vapor sampling will not be performed within 72 hours of measurable rainfall greater than 0.5-inches. If precipitation exceeding the amount identified above occurs, the sampling event will be rescheduled.

Sub-Slab Soil Vapor Sampling Equipment

The sample train for soil vapor sampling will consist of tubing, connectors, valves, and vacuum (Figure 3). All gauges and canisters will be connected by laboratory-supplied stainless steel tubing and dedicated flexible Teflon or nylon tubing. The sample train will be assembled using dedicated ¼-inch (outer diameter) tubing for all vapor sampling. Swagelok® connectors will be used for all connections between tubing and other sampling components. A flow regulator of 100 – 200 mL/min will be placed in-line between the manifold and the downhole side Swagelok® valve. Sampling equipment will be inspected to ensure tight fittings between all components. A shroud will be placed over the wellhead and the entire sampling train.

Leak Testing and Tracer Gas

The sampling manifold will be leak tested by inducing a vacuum on the manifold. In preparation for manifold leak testing, the downhole side Swagelok® valve will remain closed, as will the valves going to the purge and sample ends of the sample train. To commence leak testing, an electric air pump will be connected to the purge valve end of the sample train. The purge valve will be opened and the air pump turned on to induce a vacuum on the assembly, and the purge valve will be closed again. The vacuum on the manifold assembly will be monitored for at least 15 minutes. The manifold will be considered to have passed the leak test if vacuum was maintained for at least 15 minutes with <0.2” Hg vacuum loss. After ensuring that all connections between the purge and sample valves, flow controller, and sample manifold are tight, soil vapor purging and sampling activities will commence.

During sample collection (discussed below), helium (He) will be used as a tracer gas to test for air leakage into the sampling system. The shroud will be filled with helium, which will be supplied by a cylinder. The helium concentration inside the shroud will be maintained at a minimum of 5% to 10%, so as to have detectable levels of tracer gas should leakage into the sampling train occur. The helium concentration inside the shroud will be determined using a He field meter. Laboratory analysis for helium in the collected vapor sample will be used to assess if leakage occurred during sampling.

Vapor Point Purging

Prior to collecting a vapor sample, the sub-slab vapor points will be purged to ensure that the vapor samples were representative of actual sub-slab concentrations. The dead-space volume for each vapor point as proposed is approximately 0.05-liters (i.e. the total volume of casing, annular pore space, and sample train tubing). For the purpose of this sampling, approximately three dead-space volumes (or 0.15–liters) will be purged. The resulting purge time is estimated at approximately 1.5 minutes using 100 mL/min flow regulator. Of course, the actual volume and estimated purge time will be determined based on final vapor point construction details and sample train assembly. After purging is completed, the sample train purge valve will be closed in preparation for sample collection.

Sub-Slab Vapor Point Sampling

All samples will be collected in certified clean 1-liter Summa® canisters provided by the analytical laboratory. Each canister will be field verified to have a starting vacuum of approximately 25 "Hg before sampling. Sample collection from the soil vapor well will begin immediately after purging. Leak testing will be performed concurrently with sampling as described above. To begin sampling, the valve on the sample Summa® canister will be opened and the time and initial vacuum documented. As the canister fills, the vacuum gauge on the flow controller is observed to ensure that the vacuum in the canister is decreasing over time. When the vacuum on the sample canister decreases to approximately 5 "Hg, sampling will end and the valve will be shut.

The samples will be labeled, documented on a chain-of-custody form, and transported to the project laboratory for analysis.

Sub-Slab Vapor Sample Analysis

The sub-slab soil vapor samples will be analyzed by a certified laboratory for:

- TPHg by modified EPA Method TO-3
- BTEX and MTBE by modified EPA Method TO-15
- Helium, Oxygen, Carbon Dioxide, and Methane by Modified ASTM D-1946

Data Evaluation

The sub-slab vapor data will be evaluated as recommended per DTSC guidance (2005) and will be compared to Shallow Soil Gas ESLs from Table E of *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, Interim 2007 (Revised 2008)* and CHHSLs published in *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties (CALEPA 2005)* for commercial / industrial land use scenarios. Blue Rock recommends that at least two sub-slab soil vapor sampling events occur before a risk determination is made, in order to account for seasonal and temporal variability. If a potential risk is found, Blue Rock recommends performance of indoor air sampling as discussed in Steps 8 and 9 of the DTSC's *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*.

Proposed Project Schedule

Activity	Estimated Date
Submit Workplan	April 23, 2012
Receive Workplan Approval	May 15, 2012
Obtain ACPWA Permits (as needed)	June 1, 2012
Install Soil Vapor Points	June 15, 2012
Sample Soil Vapor Points	June 20, 2012
Perform Additional HVDPE Event	July 1, 2012
Submit Soil Vapor Sampling and HVDPE Report	August 15, 2012

References

Amicus Strategic Environmental Consulting, 2009, letter regarding Terradev Jefferson, LLC Property, 645 Fourth Street, Oakland, September 13.

Blue Rock, 2010, *Removal Action Workplan*, 645 Fourth Street, Oakland, California, February 3.

Blue Rock, 2010, *Well Installation and Removal Action Report*, 645 Fourth Street, Oakland, California, October 29.

Blue Rock, 2011, *Groundwater Monitoring Report – First Quarter 2011*, 645 Fourth Street, Oakland, California, February 1, 2011.

California EPA - DTSC. 2004. *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air.* December 15 (Revised February 7, 2005).

California EPA. 2005. *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties.* January.

Ninyo & Moore, 2009, *Limited Phase II Environmental Site Assessment*, 645 Fourth Street, Oakland, California, July 24.

Golden Gate Tank Removal, Inc. 2006, *Tank Closure Report*, 645 Fourth Street, Oakland, California, September 21.

San Francisco Bay RWQCB. 2008. *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater - Interim Final November 2007 (Revised May 2008).* May.

Certification

This report was prepared under the supervision of a California Professional Geologist at Blue Rock. All statements, conclusions, and recommendations are based upon published results from past consultants, field observations by Blue Rock, and analyses performed by a state-certified laboratory as they relate to the time, location, and depth of points sampled by Blue Rock. Interpretation of data, including spatial distribution and temporal trends, are based on commonly used geologic and scientific principles. It is possible that interpretations, conclusions, and recommendations presented in this report may change, as additional data become available and/or regulations change.

Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.

The service performed by Blue Rock has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

If you have any questions regarding this project, please contact us at (650) 522-9292.

Sincerely,
Blue Rock Environmental, Inc.

PROFESSIONAL GEOLOGIST
BRIAN M. GWINN
No 6505
exp 4/30/13
STATE OF CALIFORNIA

Brian Gwinn, PG
Principal Geologist

Attachments:

Figure 1: Site Location Map
Figure 2: Site Plan
Figure 3: Soil Gas Sampling Apparatus

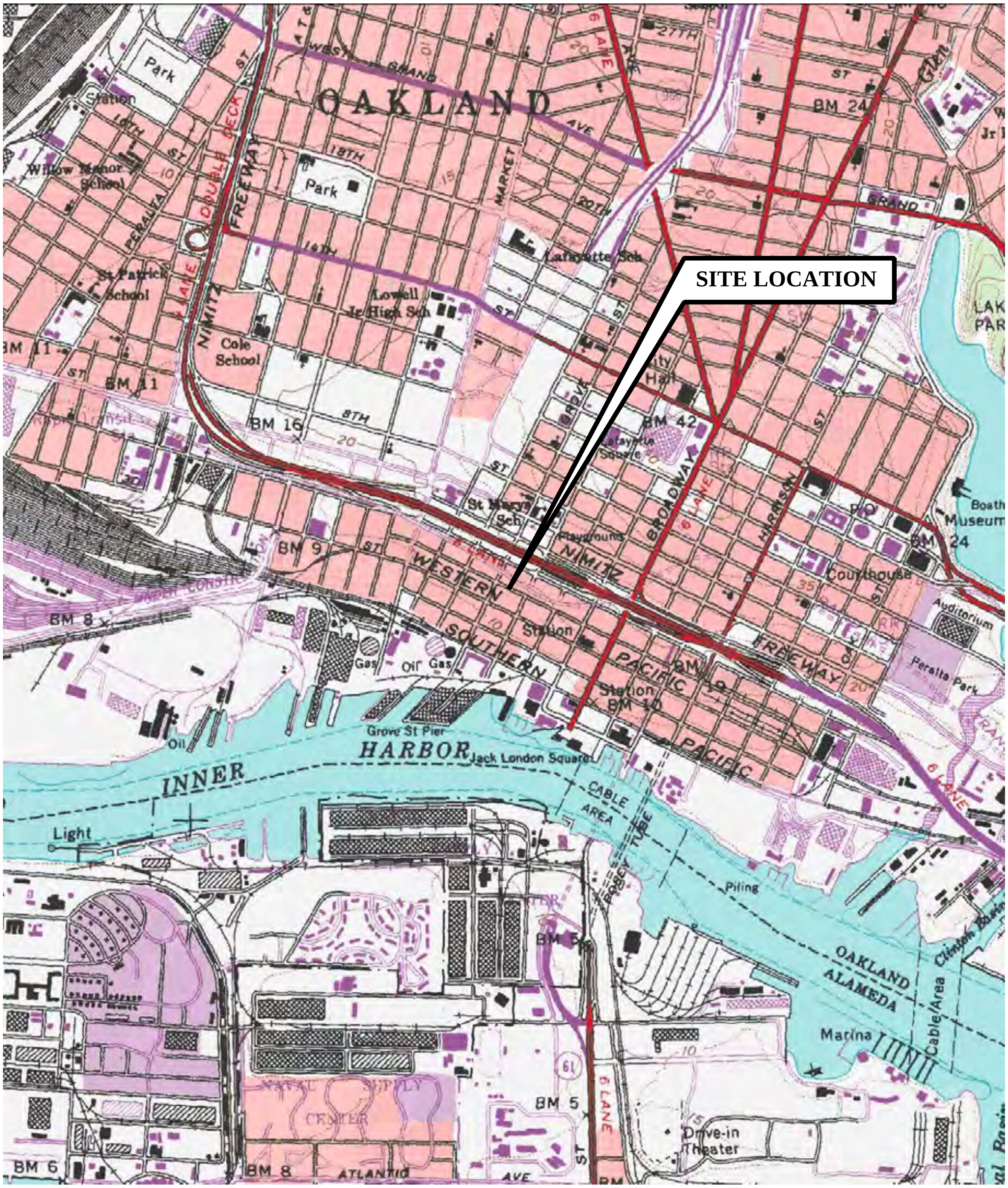
Table 1: Well Construction Data
Table 2: Soil Sample Analytical Data
Table 3: Groundwater Analytical Data

Sub-Slab Soil Vapor Point Diagram from DTSC (2005)

Distribution:

Ms. Sara May, Metrovation
580 Second St. Suite 260, Oakland, CA 94607

Mr. Markus Niebanck, Amicus Strategic Environmental Consulting
580 Second St. Suite 260, Oakland, CA 94607



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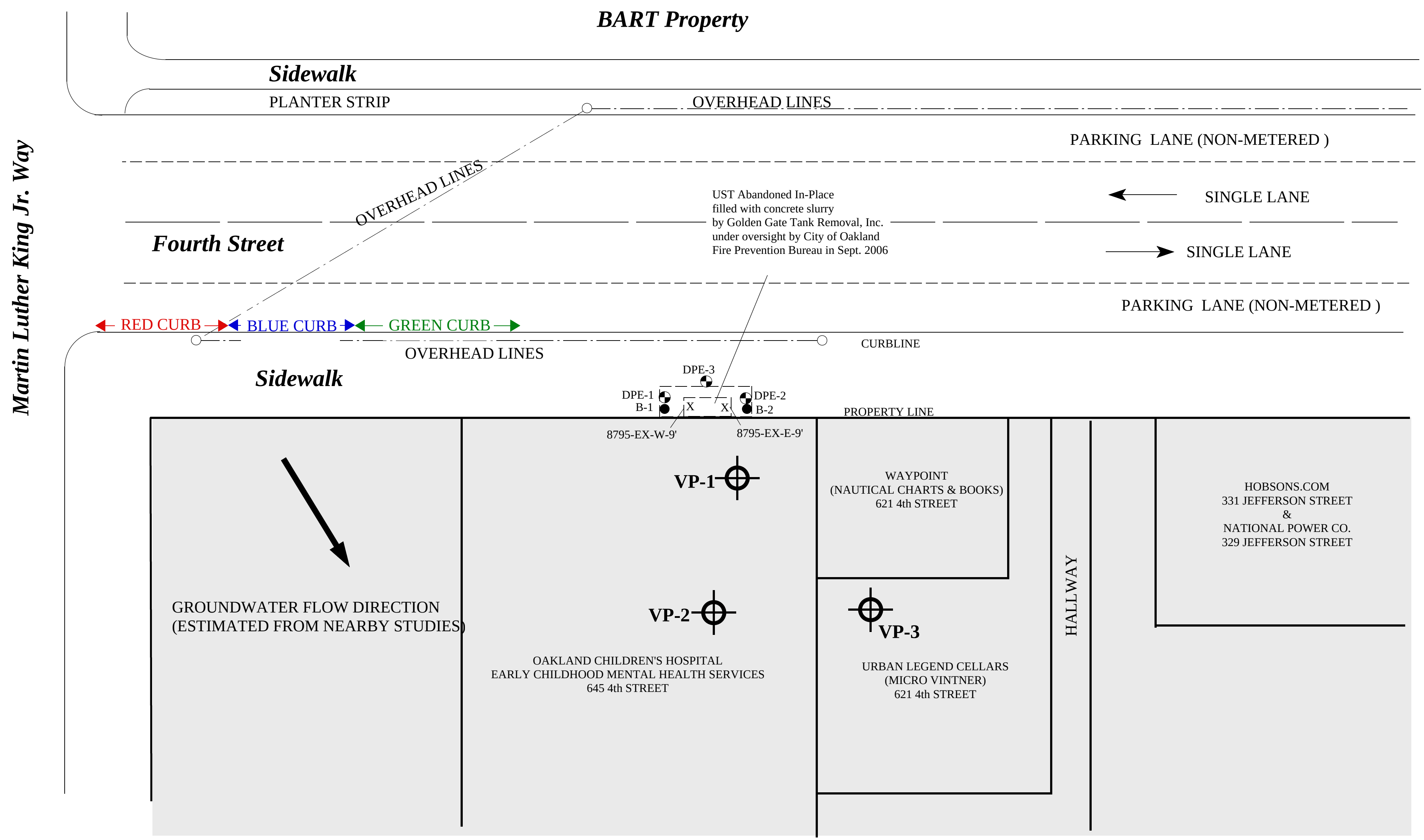
SOURCE: MyTopo.com

SITE LOCATION MAP
Terradev Jefferson LLC Property
645 Fourth St.
Oakland, CA

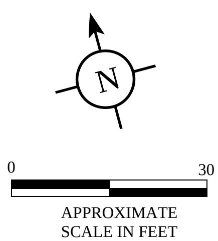
BLUE ROCK
ENVIRONMENTAL, INC.

Project No.	Figure Date	Figure
ASE-1	10/10	1



EXPLANATION

VP-1 — PROPOSED SUB-SLAB SOIL GAS SAMPLING POINT



SITE PLAN
Terredev Jefferson LLC Property
645 Fourth St.
Oakland, CA

BLUE ROCK
ENVIRONMENTAL, INC.

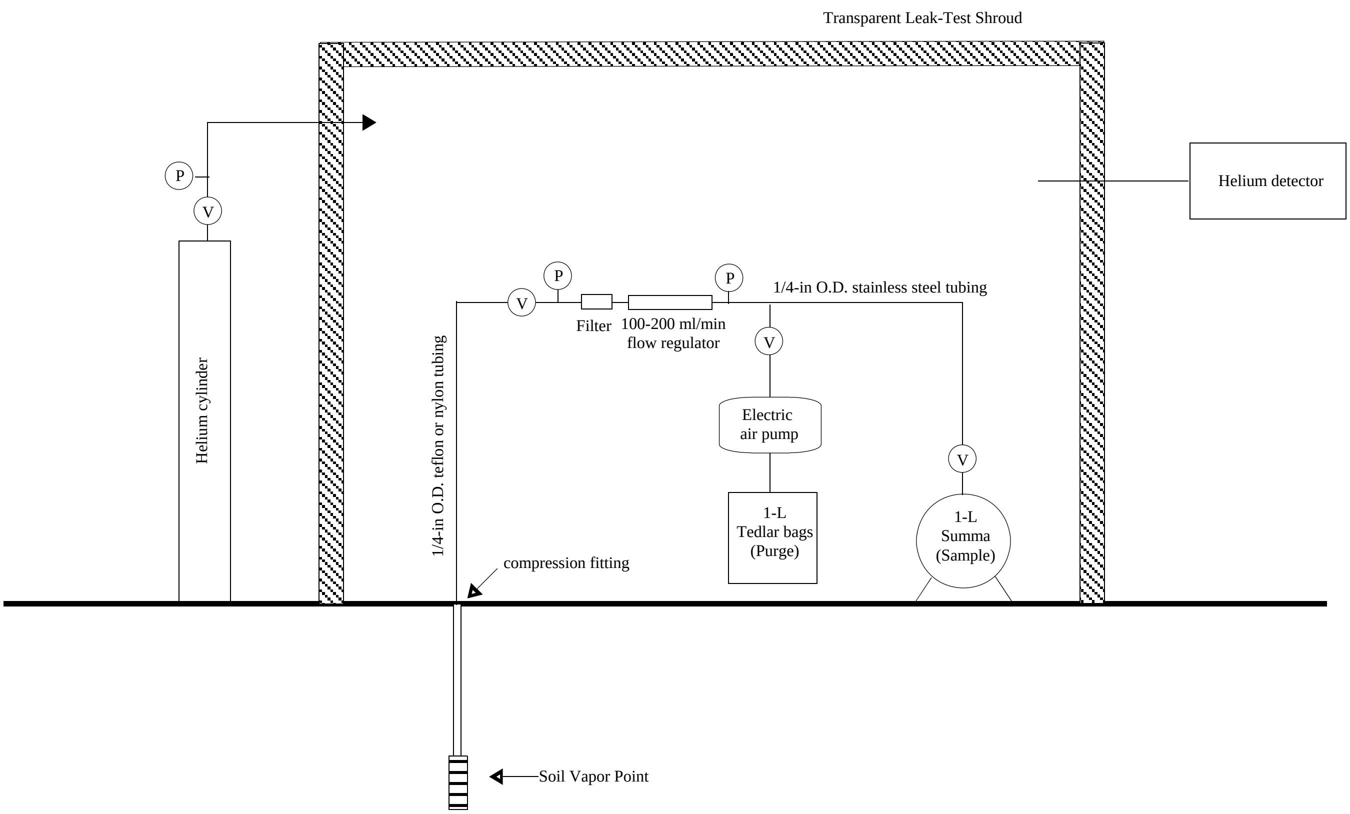
Project No.	Figure Date	Figure
ASE-1	4/12	2

EXPLANATION

(P) PRESSURE/VACUUM GAUGE

(V) VALVE

NOTE: ALL SAMPLE TRAIN TUBE CONNECTIONS AND VALVES ARE SWAGELOK



NOT TO SCALE

SOIL GAS SAMPLING APPARATUS
Terradev Jefferson LLC
645 4th St.
Oakland, California

BLUE ROCK ENVIRONMENTAL, INC.

Project No.	Figure Date	Figure
ASE-1	4/12	3

TABLE 1
Well Construction Data
Terradev Jefferson, LLC Property
645 Fourth Street
Oakland, CA

Well ID	Date Installed	Total Boring Depth (ft bgs)	Casing Diameter (inches)	Screen Depth (ft bgs)	Sandpack Depth (ft bgs)	Bentonite Depth (ft bgs)	Cement Grout Depth (ft bgs)
DPE-1	9/20/10	15	2	8 - 15	7 - 15	5 - 7	0 - 5
DPE-2	9/20/10	15	2	8 - 15	7 - 15	5 - 7	0 - 5
DPE-3	9/20/10	10	2	6 - 10	5 - 10	3 - 5	0 - 3

Notes:
ft bgs Feet below ground surface.

TABLE 2
Soil Sample Analytical Data
Terradev Jefferson, LLC Property
645 Fourth Street
Oakland, CA

Sample ID	Depth (ft bgs)	Sample Date	TPHd (mg/kg)	TPHg (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	DIPE, ETBE, TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)
UST Removal Samples													
8795-EX-W-9'	9	8/23/06	<120	**10,000**	**130**	**1,000**	**230**	**1,200**	<12	<100	all<12	---	---
8795-EX-E-9'	9	8/23/06	<25	**920**	**6.8**	**55**	**18**	**110**	<1.2	<10	all<1.2	---	---
Investigation Samples													
DPE-1-7.5	7.5	9/20/10	**810^**	**6,500**	**14**	**320**	**180**	**980**	<0.50	<2.5	---	<0.50	**0.50**
DPE-1-12	12	9/20/10	**260^**	**2,300**	**26**	**160**	**45**	**240**	**0.71**	<1.5	---	<0.30	<0.30
DPE-1-15	15	9/20/10	**92^**	**770**	**10**	**53**	**15**	**80**	**0.39**	<0.50	---	**0.11**	<0.090
DPE-2-6	6	9/20/10	**15**	**1.2**	<0.0050	**0.0054**	<0.0050	**0.021**	<0.0050	<0.0050	---	<0.0050	<0.0050
DPE-2-11	11	9/20/10	**1,200^**	**160,000**	**1,400**	**10,000**	**3,300**	**19,000**	<0.25	<1.5	---	<0.25	**1.8**
DPE-2-15	15	9/20/10	**66^**	**430**	**3.8**	**25**	**8.3**	**47**	<0.50	<2.5	---	<0.050	<0.50
DPE-3-7	7	9/20/10	**260^**	**860**	**2.1**	**37**	**19**	**100**	<0.10	<0.50	---	<0.10	<0.10
DPE-3-10	10	9/20/10	**800^**	**8,900**	**78**	**580**	**180**	**980**	<0.25	<1.5	---	<0.25	**0.82**

Notes:

ft bgs	feet below ground surface
mg/kg	milligrams per kilogram
TPHd	total petroleum hydrocarbons as diesel by EPA Method 8015M or 8015B
TPHg	total petroleum hydrocarbons as gasoline by EPA Method 8260B
BTEX	benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260B
MTBE, TBA, ETBE, DIPE, TAME	methyl tert-butyl ether, tert-butanol, ethyl tert-butyl ether, di-isopropyl ether, tert-amyl methyl ether by EPA Method 8260B,
1,2-DCA, EDB	1,2-dichloroethane, 1,2-dibromoethane by EPA Method 8260B.
µg/L	Micrograms per liter.
<###	Not detected at or above the indicated reporting limit.
^	Laboratory Flag: Hydrocarbons are lower-boiling than typical Diesel Fuel
---	Data not available, not monitored, or not sampled

TABLE 3
Groundwater Analytical Data
Terradev Jefferson, LLC Property
645 Fourth Street
Oakland, CA

Sample ID	Sample Date	TOC (ft MSL)	DTW (ft)	LNAPL (ft)	GWE (ft MSL)	TPHd (µg/L)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	TBA (µg/L)	1,2-DCA (µg/L)	EDB (µg/L)
Grab Groundwater Samples															
B-1-GW*	7/10/09	--	~10 - 20	--	--	**5,300**	**78,000**	**15,000**	**13,000**	**1,700**	**10,500**	**570**	--	--	--
B-2-GW*	7/10/09	--	~10 - 20	--	--	**2,300**	**60,000**	**13,000**	**13,000**	**890**	**4,800**	**120**	--	--	--
Monitoring Well Data															
DPE-1	9/22/10	15.81	9.21	0.00	6.60	<4,000^	**120,000**	**25,000**	**18,000**	**3,300**	**17,000**	**320**	**320**	**620**	<40
Screen	9/28-10/3/10	15.81	--	--	--	5-day HVDPE Remedial Event									
~8' - 15'	10/18/10	15.81	9.26	sheen	6.55	<4,000^	**97,000**	**15,000**	**20,000**	**1,600**	**11,000**	**490**	**270**	**390**	<40
	1/20/11	15.81	8.56	sheen	7.25	<3,000^	**83,000**	**12,000**	**16,000**	**2,000**	**11,000**	**270**	<200	**220**	<40
DPE-2	9/22/10	16.01	9.44	0.00	6.57	<4,000^	**110,000**	**21,000**	**18,000**	**3,100**	**14,000**	**200**	**260**	**540**	**110**
Screen	9/28-10/3/10	16.01	--	--	--	5-day HVDPE Remedial Event									
~8' - 15'	10/18/10	16.01	9.48	sheen	6.53	<5,000^	**84,000**	**11,000**	**16,000**	**1,600**	**9,200**	**77**	<200	**220**	**77**
	1/20/11	16.01	8.77	sheen	7.24	<5,000^	**94,000**	**12,000**	**19,000**	**2,500**	**13,000**	**64**	<200	**220**	**88**
DPE-3	9/22/10	15.87	9.43	0.00	6.44	insufficient water column for sampling (i.e. <0.5-ft)									
Screen	9/28-10/3/10	15.87	--	--	--	5-day HVDPE Remedial Event									
~6' - 10'	10/18/10	15.87	9.35	0.00	6.52	insufficient water column for sampling (i.e. <0.5-ft)									
	1/20/11	15.87	8.51	**0.13**	7.36	no groundwater sample collected, LNAPL present.									

Notes:

Screen	Well screen depth interval.
TOC	Top of casing relative to feet above mean sea level (ft MSL) (ref NAVD88).
DTW	Depth to water (for borings DTW shows "depth to water" and "depth to bottom of boring")
LNAPL	Light non-aqueous phase liquid petroleum, "sheen" is an immeasurable thickness (i.e. <0.01-ft)
GWE	Groundwater Elevation (TOC-DTW) in ft MSL. (This does not account for LNAPL thickness, if present).
TPHd	Total petroleum hydrocarbons as diesel by EPA Method 8015M, *8015B.
TPHg	Total petroleum hydrocarbons as gasoline by EPA Method 8260B, * 8015B.
BTEX	Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260B, * 8021B.
	Note: total xylenes equal the sum of sepearate isomers reported for the 7/09 samples.
MTBE	Methyl tert-butyl ether by EPA Method 8260B, * 8021B.
TBA	Tert-butanol by EPA Method 8260B.
1,2-DCA, EDB	1,2-dichloroethane, 1,2-dibromoethane by EPA Method 8260B.
µg/L	Micrograms per liter.
<###	Not detected at or above the indicated reporting limit.
^	Method detection limit increased due to ineterference from gasoline range hydrocarbons
---	Data not available, not monitored, or not sampled

SCHEMATIC DIAGRAM OF A SUBSLAB SAMPLING PROBE