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By Alameda County Environmental Health at 3:31 pm, Sep 12, 2014

September 12, 2014

Jerry Wickham PG, CHG
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6540

Subject: Vapor Intrusion Evaluation Work Plan for the Former Pacific Electric Motors Site 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411)

Dear Mr. Wickham:

Enclosed is the revised Vapor Intrusion Evaluation Work Plan for the Former Pacific Electric Motors Site 1009 66th Avenue, Oakland, California; Alameda County Environmental Health (ACDEH) Fuel Leak Case Number RO0000411 ("the Site"). This report was prepared in response to a request from ACEH to evaluate potential vapor intrusion concerns related to residual volatile organic compounds that may be in soil, soil gas, and groundwater at the Site. The work plan was revised in response to the conditional approval letter from ACEH dated July 24, 2014..

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions or comments, please call Erica Kalve of ARCADIS at (415) 491-4530 extension 22, or me at (510) 434-5071.

Sincerely,

Tim Simon
Aspire Public Schools

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Aspire Public Schools – College for Certain, LLC

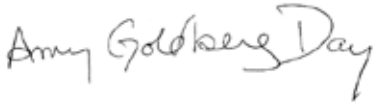
Revised Vapor Intrusion Evaluation Work Plan

Former Pacific Electric Motors Site
1009 66th Avenue, Oakland, California
(Fuel Leak Case Number RO0000411)

September 12, 2014

ARCADIS

Erica Kalve, P.G.
Senior Geologist



Amy Goldberg Day
Principal Toxicologist

Revised Vapor Intrusion Evaluation Work Plan

Former Pacific Electric Motors Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411)

Prepared for:
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Our Ref.:
EM009155.0017

Date:
September 12, 2014

ARCADIS

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Certification

All hydrogeologic and geologic information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by an ARCADIS U.S., Inc., California Professional Geologist .*

September 12, 2014

Erica Kalve, P.G.
Senior Geologist
California Professional Geologist (8245)

Date

*A professional geologist's certification of conditions comprises a declaration of his or her professional judgment. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations, and ordinances.

1. Introduction

ARCADIS has prepared this work plan on behalf of College for Certain, LLC (CFC) for the Former Pacific Electric Motors (PEM) Facility located at 1009 66th Avenue in Oakland, California ("the Site"; Figures 1 and 2). Alameda County Department of Environmental Health (ACDEH) provided conditional approval of the Vapor Intrusion Evaluation Work Plan dated July 2011, which included a combined soil gas and indoor air sampling plan (ARCADIS 2011). The soil investigation plan addressed vapor intrusion concerns in the vicinity of proposed building 300; a revised work plan is required to address vapor intrusion concerns in the vicinity of building 200 (Figure 2).

This work plan was developed to address vapor intrusion evaluation concerns related to residual volatile organic compounds (VOCs) in soil, soil gas, and groundwater. This work plan follows applicable guidance per the Department of Toxic Substances Control (DTSC) Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (the DTSC Vapor Intrusion Guidance Document; DTSC 2011) to evaluate potential vapor intrusion into building 200 (see Figure 2).

1.1 Remedial Action Objectives

A baseline human health risk assessment was conducted for the Site and presented in LFR Inc.'s (now ARCADIS) Revised Corrective Action Plan (CAP) dated July 19, 2009 (ARCADIS 2009a). The quantitative baseline human health risk assessment resulted in calculated cleanup goals for soil and groundwater that were protective of human health. Remedial actions were developed and implemented to reduce concentrations of chemicals of potential concern (COPCs) and mitigate potentially complete exposure pathways at the Site related to inhalation of vapors (from soil and groundwater) and particulates (from soil), soil ingestion, and dermal absorption from soil. The primary objective of the remedial actions was to reduce the concentrations of COPCs in soil, soil gas, and groundwater to levels protective of human health and the environment, and to allow for redevelopment of the Site.

1.2 Work Plan Objectives

Post remedial soil and groundwater sampling has confirmed that remedial actions have successfully reduced concentrations of COPCs in soil and groundwater. ACDEH has requested the collection of additional soil gas data to confirm that remedial actions have also reduced concentrations of COPCs in soil gas and to ensure that vapor intrusion is not a concern at the existing and proposed on-site buildings. A vapor

intrusion evaluation is currently being conducted in the area of proposed building 300. An additional evaluation is necessary to address vapor intrusion concerns at the existing building 200. Vapor intrusion modeling has been previously conducted and presented in the Appendix C of the groundwater monitoring report for the period July 1 through September 30, 2010 (ARCADIS 2010). This additional evaluation will be used to supplement the previous findings that COPCs related to the vapor intrusion pathway are not a concern in this vicinity of the Site.

COPCs related to the vapor intrusion pathway include benzene, toluene, ethylbenzene, and total xylenes (BTEX), methyl tertiary-butyl ether (MTBE) and naphthalene. The objective of this vapor intrusion evaluation is to collect data to evaluate soil gas and crawl space air quality and verify that COPCs in soil gas and in the space underneath the existing building are below levels of concern. If data suggest that vapor intrusion is not a concern at the Site (i.e., risk is less than 1×10^{-6}, hazard index less than or equal to 1.0), no further action will be necessary. If data suggest that a significant risk or hazard related to vapor intrusion is present, vapor intrusion mitigation measures will be developed and implemented to prevent potential exposure to subsurface vapors in indoor air.

2. Site History

2.1 Project Overview

The site area is 2.51 acres and is located on the western side of 66th Avenue between East 14th Street (to the north) and San Leandro Street (to the south). The area around the Site is developed with a mixture of commercial, industrial, government, and multi-family residential buildings. The Site is bounded by a residential development to the north, Oakland Fire Department Station Number 2 to the east across 66th Avenue, Fruitvale Business Center to the south, and Northstar International Container Freight and Container Consolidation Services to the west.

The structures formerly associated with Pacific Electric Motors (and infrastructure) have all been demolished. The areas of affected soil have been removed in accordance with the Revised CAP (ARCADIS 2009a). In addition, areas of polychlorinated-biphenyl (PCB)-containing soil were remediated in accordance with the CAP, the Self-Implementing Cleanup Plan (SICP) submitted to the United States Environmental Protection Agency (USEPA) on October 23, 2009 (ARCADIS 2009b), the response letter from USEPA dated November 13, 2009 (USEPA 2009), and LFR Inc.'s (now ARCADIS) response letters to USEPA dated November 18, 2009 and

January 14, 2010. The configuration of the surface cap was presented in a letter to the USEPA by ARCADIS dated April 25, 2011 and the configuration of the cap was approved by USEPA in a letter dated June 16, 2011.

2.2 Current Conditions

The Site has been redeveloped into the Aspire Golden State College Preparatory Academy, which serves grades 6 through 12 and has capacity for 570 students; the school opened in August 2011 (see Figure 2). The school occupies approximately 1.4 acres and consists of:

- two-story buildings (approximately 41,430 square feet total including 24 full-sized classrooms, 4 labs, 3 girls and 3 boys restrooms, and 4 staff restrooms);
- a proposed one-story building that will serve as a gym and recreation facility;
- an asphalt-paved parking area with access via two driveways on 66th Avenue (one for ingress and one for egress);
- an asphalt-paved area for basketball; and
- several planter areas

As part of the redevelopment of the Site, the ground surface comprised of roadways, sidewalks, parking areas, buildings, and planter areas is serving as a cap to mitigate potential exposure to remaining PCBs containing soil at the Site.

2.3 Environmental Conditions

The Revised CAP (ARCADIS 2009a) summarized the results of previous investigations, presented the site conceptual model, quantified the baseline risk of COPCs, developed site-specific risk-based cleanup goals, evaluated potential remedies, and presented an implementation plan for the selected remedies. Prior to redeveloping the Site, these remedial tasks were conducted to remove soil containing elevated concentrations of lead, arsenic, PCBs, benzene, and total petroleum hydrocarbons as gasoline (TPHg) and to treat remaining elevated concentrations of TPHg, BTEX, tertiary butyl alcohol (TBA), and MTBE in groundwater, soil, and soil gas.

Between 2009 and 2010 several remedial actions were implemented in accordance with the Revised CAP including

- soil excavation and removal of approximately 8,662 tons of affected soil (ARCADIS 2014a).

- air injection and soil-vapor extraction to reduce concentrations of TPHg, BTEX, TBA, and MTBE in groundwater, soil, and soil gas. Two phases of soil-vapor extraction/air sparging (SVE/AS) were implemented and an estimated 798 pounds of fuel vapors were recovered from the Site (ARCADIS 2014a).

Remedial actions were highly effective in removing affected soil from the Site and remaining residual concerns related to soil exposure pathways are mitigated through maintenance of a cap and implementation of a Soil Management Plan (ARCADIS 2014b).

As documented in the Groundwater Monitoring Report (ARCADIS 2014a), the analytical results for groundwater samples collected at the Site indicate that concentrations TPHg, BTEX, and MTBE have decreased over time and remain low. This decreasing trend in concentrations is likely the direct result of the excavation and off-site disposal of fuel-affected soil that took place at the Site in 1995, 2002, and 2010, and the operation of the operation of the SVE/AS system. Additionally, the development plan for the property included (and will include) the construction of buildings with a raised foundation approximately 18 inches above the ground to create a vented “crawl space” to create a passive system to further reduce the potential for soil vapors to intrude to the onsite buildings.

3. Vapor Intrusion Evaluation

The DTSC Vapor Intrusion Guidance Document suggests that a step wise approach be used for assessing vapor intrusion concerns at a site. This revised vapor intrusion evaluation work plan follows the step wise approach by providing data necessary to characterize soil gas in the vicinity of existing building 200. Additionally, this revised approach includes collection of crawl space samples from underneath building 200 to evaluate vapor intrusion potential into existing building 200.

The proposed scope of work will be conducted under a site-specific health and safety plan (HASP) that details the scope of work and identifies the potential health and safety risks associated with the work. Indoor air and crawl space samples will be collected

following the methods and procedures described in Sections 4 and 5, below. Samples will be sent to a state certified laboratory under chain of custody procedures. The chain-of-custody will have the sample identification, date and time of collection, and the samplers' names. The chain-of-custody also will include the laboratory name, address, contact phone numbers, project name, project number, and site location. In addition, the sampler will include initial and final pressure gauge readings on the chain-of-custody. The chain-of-custody will be signed and dated with the time when samples are relinquished by the sample collection team.

4. Crawl Space Evaluation

ARCADIS previously evaluated vapor intrusion concerns for this Site using the CaliforniaDTSC version of the Johnson & Ettinger model (ARCADIS 2010; DTSC 2009). The results were submitted in "Groundwater Monitoring Report for the Period from July 1 through September 30, 2010, Former Pacific Electric Motors Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411), November 15, 2010; details concerning the vapor transport modeling are provided in Appendix C of that report (ARCADIS 2010). At that time, ARCADIS estimated COPC concentrations in groundwater that contained benzene at concentrations less than 66 micrograms per liter would not pose a vapor intrusion concern under a school site/commercial exposure scenario (ARCADIS 2010). The model first estimates an indoor air concentration based on a target health risk of 1×10^{-6}. Then it subsequently back-calculates a groundwater concentration associated with this vapor intrusion potential. The model itself generates a groundwater concentration that is not associated with a vapor intrusion health risk above the DTSC target level.

Default commercial exposure input parameters were used to calculate COPC concentrations in groundwater. These include a 25-year exposure duration, 250 days per years and eight hours per day. Building-specific defaults such as slab thickness and ventilation exchange rates were incorporated into the modeling effort. Based on the evaluation, COPCs in shallow groundwater were below the levels associated with unacceptable risk and would not be associated with a vapor intrusion health concern under the commercial exposure scenario. The exposure assumptions used under a commercial scenario are conservative for a school setting, where exposures are expected to be significantly lower.

4.1 Crawl Space Air Sample Locations

The goal of the proposed crawl space air sampling event is to collect data to evaluate the potential for vapor intrusion to occur into the onsite building. The data generated from the indoor air investigation will be used to assess if vapor intrusion pathways may be present. The investigation includes implementation of one crawl space sample event to evaluate potential vapor intrusion in the existing building 200. During the proposed crawl space air sample event, one background/outdoor sample, and one duplicate sample will be collected. The background/outdoor sample will be collected from outside of building 200 and analyzed to assess ambient air quality that could be affecting indoor air quality.

4.2 Indoor Air Field Sampling Equipment

Air samples for will be collected in 6-liter stainless steel evacuated Summa canisters designed specifically for collecting indoor and outdoor ambient air samples. Each 6-liter Summa canister will be equipped with a flow controller and flow restrictor that use a critical orifice to regulate the flow of air into the canister. The flow controllers will be checked by the laboratory to verify air flow for each canister is set at the appropriate rate for the collection of 8-hour samples (assumed typical onsite receptor scenario; to be confirmed during the building walkthrough), before a canister is deployed to the field. The orifice is designed to allow for regulated flow of air between an 8-hour to 24-hour sample period. No flow checks will be performed in the field. The canister will be pre-evacuated by the laboratory to approximately -30 inches of mercury (Hg).

To ensure that the collected samples will meet the planned end use for this study, the following sample guidelines will be followed:

- If the initial vacuum gauge reads less than 26 inches of Hg, the canister will be replaced prior to sample collection.
- If the canister is not under vacuum, the sample will be considered a grab sample.
- If the final vacuum gauge reads greater than 20 inches of Hg, the sample will be rejected.

The crawl space sample collection device will be positioned inside the crawl space, at least five feet away from the crawl space access point. Each outdoor air sampling

collection device will be positioned at the height deemed representative (either on the roof or outside on the upwind side at approximately 3 to 5 feet above ground surface).

4.3 Indoor Air Field Sampling Procedures

Indoor sources of chemicals of concern and other VOCs may exist within the onsite building. Some significant impacts on indoor air quality may come from the use of consumer products, building materials, and personal activities. For example, VOCs can be found in cleaning agents, glues, deodorizers, dry-cleaned clothing, cigarette smoke, paints, varnishes, vehicle maintenance compounds, and vehicle exhaust. A building walkthrough will be conducted prior to implementation of the sample event to identify potential indoor air sources of chemicals of concern. The product inventory will focus on potential interferences from chemicals and products present throughout the building.

Eight-hour integrated air samples will be collected at the proposed sample locations. Samples will be analyzed using a low-level TO-15 Selected Ion Monitoring (SIM) analytical method for VOCs following the procedures discussed below.

Sampling Procedure

To start the sampling event:

1. Place the canister in the proper location (as indicated in Section 3.1).

2. Record the initial vacuum (approximately -30 inches of mercury [Hg]) of the canister on the Air Sampling Log (a copy of the log is presented as Appendix A).

3. Using a wrench, remove the closing bolt on the top of the canister and attach the flow controller device, tighten with a wrench (with filter in-line), open the canister bellows valve, and note the start time. Start any co-located canisters at the same time.

To complete the sampling event:

1. Close the canister bellows valve and note the stop time on the Air Sampling Log (Appendix A).

2. Using a wrench, detach the flow controller.

3. Replace the closing bolt on top of the canister and tighten with a wrench. Record the final vacuum of the canister on the Air Sampling Log (Appendix A).

The outdoor ambient air sample collection will follow the same sample protocol as the crawl space air sample. Sample collection will begin within one hour of the start of crawl space air sampling.

Meteorological data for this investigation will be obtained from a nearby weather station located in Oakland, California. Data will be collected for the time period corresponding to the sampling period. Data collected will include maximum and minimum temperatures, precipitation accumulation, and a summary of hourly wind speed and direction. The meteorological data will be cross-checked with field observations documented in the field sampling logs

4.4 Sample Analyses

Air samples will be transferred under strict chain-of-custody procedures to a California-certified laboratory and analyzed for a site-specific list of VOCs (see Table 1) by USEPA Method TO-15 (SIM). All Summa canisters will be individually certified cleaned, rather than batch certified, by the laboratory prior to sample collection. Low-level selective ion monitoring (SIM) methods will be utilized to meet the necessary reporting limits for the data evaluation process. A list of laboratory reporting limits for the site-specific list of COPCs is provided in Table 1.

The samples will be analyzed for low-level analysis; however, the actual analytical reporting limits for each sample may vary based on actual sample volume collected and any sample dilution required in the laboratory for canister pressurization and sample analysis pursuant to the laboratory analytical method.

4.5 Sample Documentation

Field notes will be maintained in an Air Sampling Log (Appendix A). As noted, project name/project number, sample ID, start date, start time, stop date, stop time, weather, start temperature, stop temperature, start barometric pressure, stop barometric pressure, start vacuum, stop vacuum, sample canister number, and sampler name will be recorded in the Air Sampling Log. The log will be kept on file at the ARCADIS office and will be available for review by authorized personnel. Sample tags will also be attached to each canister as a backup for the log entries.

A digital image of each sampling location will be acquired at the time of sampling. Where possible, a detailed photo log will be maintained throughout the project documenting, at a minimum, the photo file name, tenant space identifier, sample date, and description of sample location.

5. Soil Gas Evaluation – Building 200

This section presents the field sampling activities related to implementation of Step 7 of the DTSC Vapor Intrusion Guidance Document (DTSC 2011) in the vicinity of the proposed onsite building (see Figure 3). Field sampling activities will be conducted by a drilling subcontractor for installation of temporary soil vapor sampling points and by field personnel from ARCADIS for collection of soil gas samples. Subsurface work will be conducted in accordance with the Soil Management Plan (SMP) (ARCADIS 2014b).

5.1 Soil Vapor Sample Locations

This soil vapor sampling plan focuses on the shallow vadose zone present at 3 to 4 feet below ground surface (bgs). Five locations are proposed for investigation around the perimeter of the building 200. This work plan includes installation of permanent vapor probes that will remain onsite for approximately three weeks. If long-term monitoring of these points is not needed, the vapor probes will be removed following ACDEH approval.

5.2 Vapor Probe Installation

Prior to installing soil vapor monitoring points, utility clearance will be provided for the proposed sampling areas, as well as contingency areas. A drilling permit from the Alameda County Public Works Agency, Water Resources Section (ACPWA) will be obtained and a grouting inspection with an agent from the county will be scheduled.

The soil vapor monitoring points will be installed in accordance with the DTSC Active Soil Gas Investigation Advisory (April 2012) guidance (DTSC 2012). The soil vapor monitoring points will be installed using augering techniques. The well design (Figure 4) and sampling train (Figure 5) are designed based on the schematics provided in the DTSC Active Soil Gas Investigation Advisory. The soil vapor monitoring points will be installed using the same construction as the existing soil vapor probes (SVP-1 through SVP-5; Figure 3).

5.3 Vapor Sample Collection Procedures

The soil vapor probes will cure for at least 48 hours after installation before implementing soil sampling procedures. Per the DTSC Active Soil Gas Investigation Advisory (April 2012) guidance, shut-in tests, leak check tests and purge volume tests will be conducted on one of the soil vapor monitoring points to ensure robust sample collection (DTSC 2012). Each test is described below.

The shut-in test will be conducted by assembling the above-ground valves, lines and fittings downstream from the top of the soil gas monitoring point. The system will be evacuated to a minimum measured vacuum of about 100 inches of water using a purge pump. The test will be conducted while the sampling canister is attached with its valve in the closed position. The vacuum gauge will be connected to the system with a "T"-fitting for at least one minute or longer and field staff will observe the reading. If there is any observable loss of vacuum, the fittings will be adjusted until the vacuum in the sample train does not noticeably dissipate. After the shut-in test is validated, the sampling train will not be altered. The vacuum gauge will be calibrated and sensitive enough to indicate a water pressure change of 0.5 inches.

The quantitative leak test will be conducted on the sample manifold using the shroud and helium methodologies and helium will be measured in the field using a handheld gas meter at the time of sample collection. Note that samples will not be collected from the sample port until the leak test confirms that leaks are not present based on detections of helium above the accepted 5% (DTSC 2012). The helium shroud concentrations will be noted in the field notes and helium will be added to the shroud throughout the sample collection process to maintain the target concentration. Analytical samples will be analyzed for helium using ASTM Method 1946 to confirm that no significant leaks were present at the time of sample collection.

A purge test was performed during the soil gas sampling conducted near proposed building 300 (at soil vapor point SVP-1) to ascertain the proper purge volume for the investigation. This location was chosen as it is close in proximity to groundwater monitoring well NW-2S, where the highest concentration of COPCs were detected in shallow groundwater during the recent groundwater sampling event (see Figure 3). Soil-vapor samples were collected using 3, 5, and 7 volume purges from the sample apparatus. Samples were collected directly into calibrated disposable syringes for analysis by a hand-held and calibrated photoionization detector (PID) as an indication of total VOCs present in soil gas. The purge volume sample that reports the highest concentration of VOCs was the 3 -volume purge (1,390 milliliters [mL]). This same

purge volume will be used as a guide for each of the purge volumes for the soil gas monitoring point conducted at proposed locations SVP-6 through SVP-10.

Laboratory samples will be collected following the purge test and soil gas samples will be submitted for VOC analysis using modified USEPA Method TO-15 (SIM), methane, carbon dioxide, oxygen, and helium by Modified ASTM Method D-1946, and naphthalene by USEPA Method TO-17.

5.4 Decommissioning and Waste Management

Following review of the analytical data, ARCADIS will determine if confirmation sampling is necessary. Confirmation sampling would be conducted if an unexpected, elevated result is detected in one or more of the soil gas samples.

Investigation-derived waste generated during the field activities, including soil cuttings, decontamination or rinse water and personal protective equipment, will be stored temporarily at the Site in clean, labeled, Department of Transportation-approved 55-gallon drums or similar, prior to disposal. Soil will be characterized and disposed of following the procedures outlined in the SMP.

5.5 Contingencies

Contingencies related to potential underground utilities conflict in the area of the soil vapor sampling point locations and the likelihood that the clayey geology will not allow for adequate sampling flow rates are described here.

In order to continue work in the event of underground utilities within the proposed soil vapor monitoring points, other contingency areas (15 to 20 feet near the proposed sample locations) will be identified and cleared for utilities during the pre-installation activities. This will help ensure installation of soil vapor monitoring points in useful locations.

6. Data Evaluation and Reporting

6.1 Crawl Space Air Data Evaluation

Initially, samples results will be compared to USEPA Regional Screening Levels (RSLs)

(USEPA 2014) for residential air quality criteria with exceptions for specific compounds as noted by Human Health Risk Assessment (HHRA) Note Number 3 (DTSC 2014). Crawl space air sample results will be compared to outdoor air concentrations to evaluate whether indoor air quality may be affected by sources unassociated with vapor intrusion, and USEPA RSLs with DTSC Note 3 updates to evaluate vapor intrusion potential for the list of site-specific compounds (Table 1). If the residential screening criteria are exceeded, then indoor air sampling may be needed to further evaluate if elevated levels of VOCs are present in indoor air.

6.2 Soil Gas Data Evaluation

The goal of the soil gas sampling event is to collect data to assess the vapor intrusion potential in the vicinity of building 200. This is consistent with the DTSC Guidance (DTSC 2011) multiple lines of evidence (MLE) approach for evaluating vapor intrusion potential. The previous groundwater to indoor air evaluation results indicated that vapor intrusion was not a health concern at the Site (ARCADIS 2014a). The soil gas data will be used in conjunction with the crawl space sample results and the previous groundwater evaluation to provide MLE support for this conclusion. Therefore, only one soil vapor sampling event is currently planned.

If the detected concentrations in soil gas exceed the risk-based soil vapor threshold concentration, a human health risk assessment may be conducted using site-specific parameters, including the calculated soil vapor attenuation factor. If a site-specific screening evaluation is needed, the Office of Environmental Health Hazard Assessment (OEHHA) 2004 guidance for school site risk assessment will be followed to complete the human health risk assessment, as required per DTSC Vapor Intrusion Guidance (OEHHA 2004; DTSC 2011).

6.3 Reporting

Upon completion of the proposed sampling program, a data report will be prepared and submitted to the DTSC. At a minimum, the report will include the following items:

- introduction and background
- summary of air and soil gas sampling and analysis results, including data tables and sample location maps
- evaluation of the potential human health risk associated with soil vapor;

- summary of field QA/QC activities
- summary of laboratory data validation and QA/QC activities
- copies of laboratory reports and chain-of-custody forms
- laboratory QA/QC data
- conclusions and recommendations, as appropriate

7. References

ARCADIS U.S., Inc. (ARCADIS). 2009a. Revised Corrective Action Plan, Proposed Aspire School Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case No. RO0000411). July 17.

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United States Environmental Protection Agency (USEPA). 2009 response letter from USEPA dated November 13, 2009.

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Tables

Table 1
Site-Specific List of Volatile Organic Compounds
and Associated Screening Levels for Indoor Air and Soil Gas
Former Pacific Electric Motors Facility
1009 66th Avenue, Oakland, California

(concentration reported in micrograms per cubic meter)

Compound Name	Base RL (ug/m^3)	USEPA Residential RSL for Indoor Air/DTSC Note 3 (ug/m^3)	Adjusted Soil Gas Screening Level Future Residential Buildings[1]
Total Petroleum Hydrocarbons (gasoline)[2]	41	--	--
Benzene	0.16	0.084	84
Toluene	0.075	310	310,000
Ethylbenzene		1.1	1,100
m,p-Xylene	0.17	100	100,000
o-Xylene	0.087	100	100,000
Methyl Tertiary-Butyl Ether (MTBE)	0.36	11	11,000
Naphthalene	0.05	0.083	83

Notes

RL = reporting limit

USEPA = United States Protection Agency

RSL = Regional Screening Levels

-- = not available; aliphatic and aromatic screening levels will be used as appropriate

1 = Attenuation factor for a future residential building is 0.001 (DTSC 2011).

2 = Total Petroleum Hydrocarbons to be analyzed for aliphatic and aromatic fractions.

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Figures

MAP SOURCE: Copyright 1995, Thomas Bros. Map ALAMEDA COUNTY 2002 Edition

0 2,000 4,000 FEET

1009 66TH AVENUE, OAKLAND, CALIFORNIA

SITE VICINITY MAP

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FIGURE 1

DESIGN\003\09155\Figure 1 Site Vicinity - 003-09155.cdr

LEGEND:

- Property Line
- MW-4 — Monitoring Well
- NW-2S — Nested Monitoring Well
- AS-6I — Air Injection Well
- ASMW-5D — Air Injection Monitoring Well
- SVE-4 — SVE or SVE Monitoring Well

NOTES:

SVE = Soil Vapor Extraction

GREY symbols represent abandoned well locations

MW-1
NW-1S, 1I, 1D
F.R.
Building B
F.R.
Building A
SVE-2
AS-2D
AS-2I
SVE-3
AS-3D
AS-3I
SVE-4
AS-4D
UP
AS-4I
EW-1
NW-2S, 2I, 2D
SVE-1
AS-1D
AS-1I
SVE-5
AS-5D
AS-5I
SVMW-2
ASMW-2D
ASMW-2I
MW-4
SVE-6
AS-6D
AS-6I
SVMW-3
ASMW-3D
ASMW-3I
SVE-7
AS-7D
AS-7I
SVE-8
AS-8D
AS-8I
SVMW-5
ASMW-5D
ASMW-5I
F.R.
SVMW-4
ASMW-4D
ASMW-4I
MW-3
NW-3S, 3I, 3D
MW-2

N

0 20 FEET
(SCALE: 1" = 20')

1009 66TH AVENUE, OAKLAND, CALIFORNIA

SITE PLAN

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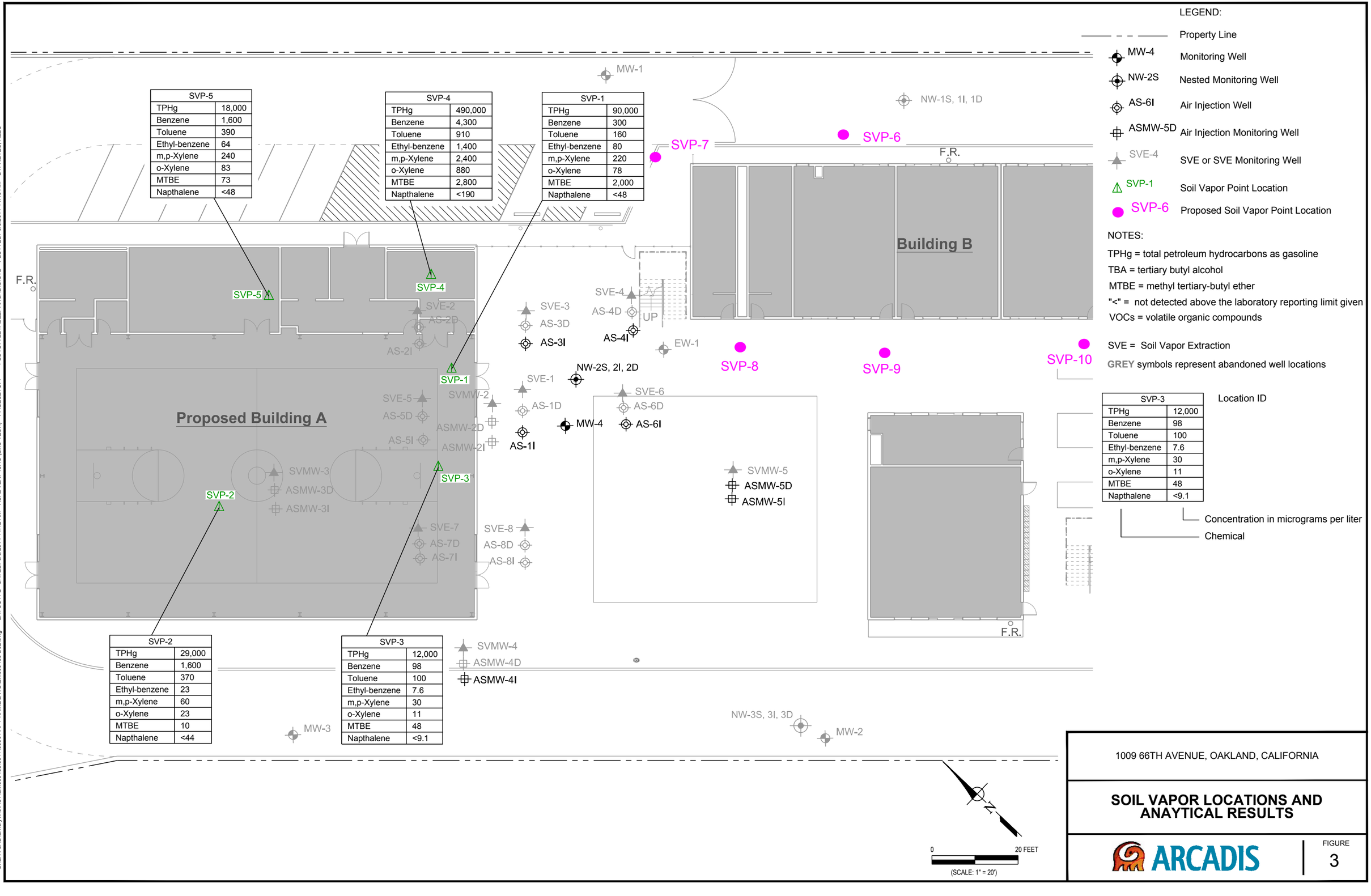
FIGURE
2



SVP-5	
TPHg	18,000
Benzene	1,600
Toluene	390
Ethyl-benzene	64
m,p-Xylene	240
o-Xylene	83
MTBE	73
Napthalene	<48

SVP-4	
TPHg	490,000
Benzene	4,300
Toluene	910
Ethyl-benzene	1,400
m,p-Xylene	2,400
o-Xylene	880
MTBE	2,800
Napthalene	<190

SVP-1	
TPHg	90,000
Benzene	300
Toluene	160
Ethyl-benzene	80
m,p-Xylene	220
o-Xylene	78
MTBE	2,000
Napthalene	<48

SVP-2	
TPHg	29,000
Benzene	1,600
Toluene	370
Ethyl-benzene	23
m,p-Xylene	60
o-Xylene	23
MTBE	10
Napthalene	<44

SVP-3	
TPHg	12,000
Benzene	98
Toluene	100
Ethyl-benzene	7.6
m,p-Xylene	30
o-Xylene	11
MTBE	48
Napthalene	<9.1

LEGEND:

- Property Line
- MW-4 — Monitoring Well
- NW-2S — Nested Monitoring Well
- AS-6I — Air Injection Well
- ASMW-5D — Air Injection Monitoring Well
- SVE-4 — SVE or SVE Monitoring Well
- SVP-1 — Soil Vapor Point Location
- SVP-6 — Proposed Soil Vapor Point Location

NOTES:

TPHg = total petroleum hydrocarbons as gasoline
TBA = tertiary butyl alcohol
MTBE = methyl tertiary-butyl ether
"<" = not detected above the laboratory reporting limit given
VOCs = volatile organic compounds

SVE = Soil Vapor Extraction

GREY symbols represent abandoned well locations

Location ID

SVP-3 | TPHg | 12,000

Concentration in micrograms per liter

Chemical

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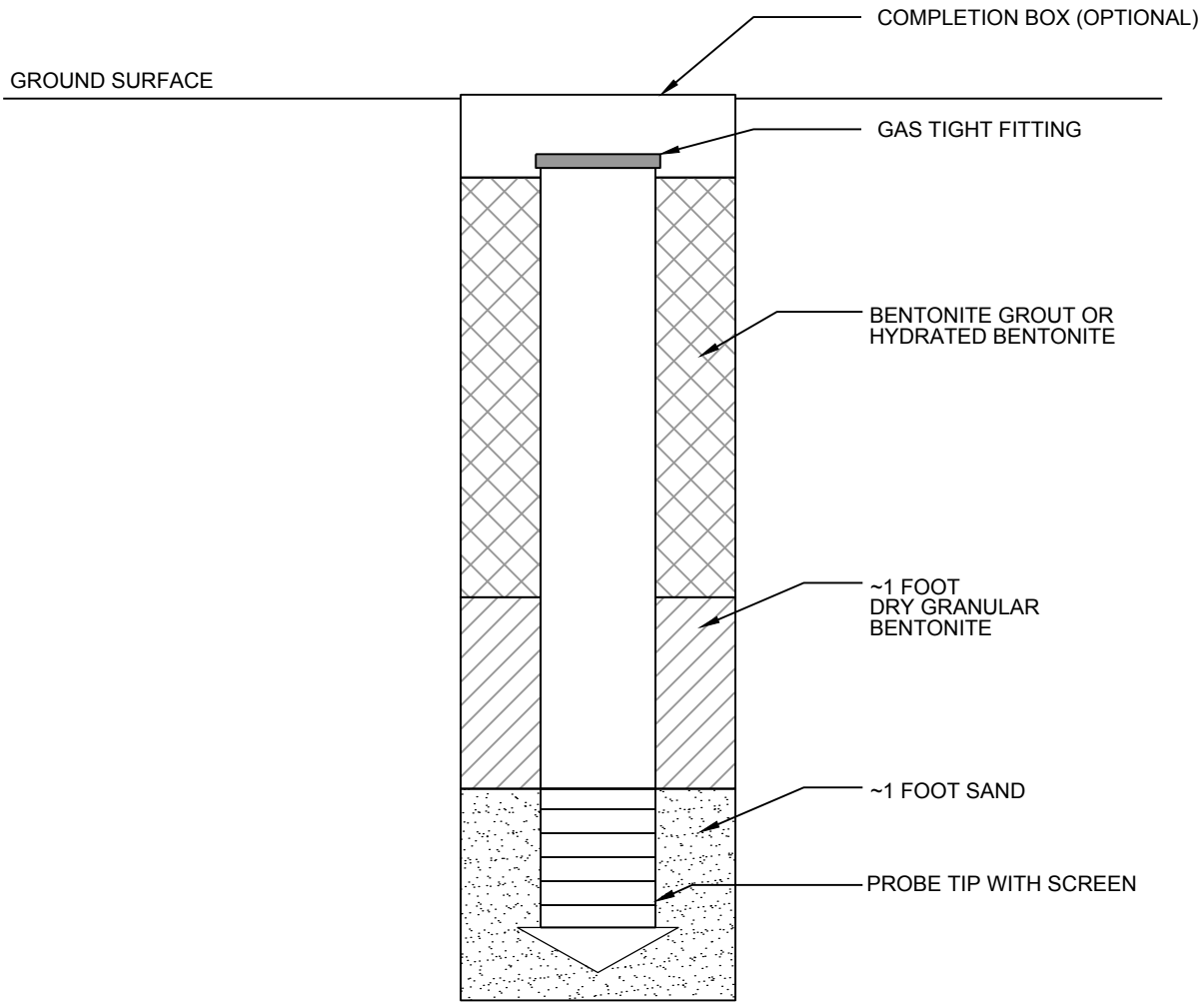
SOIL VAPOR LOCATIONS AND ANAYTICAL RESULTS

ARCADIS

FIGURE 3



NOT TO SCALE

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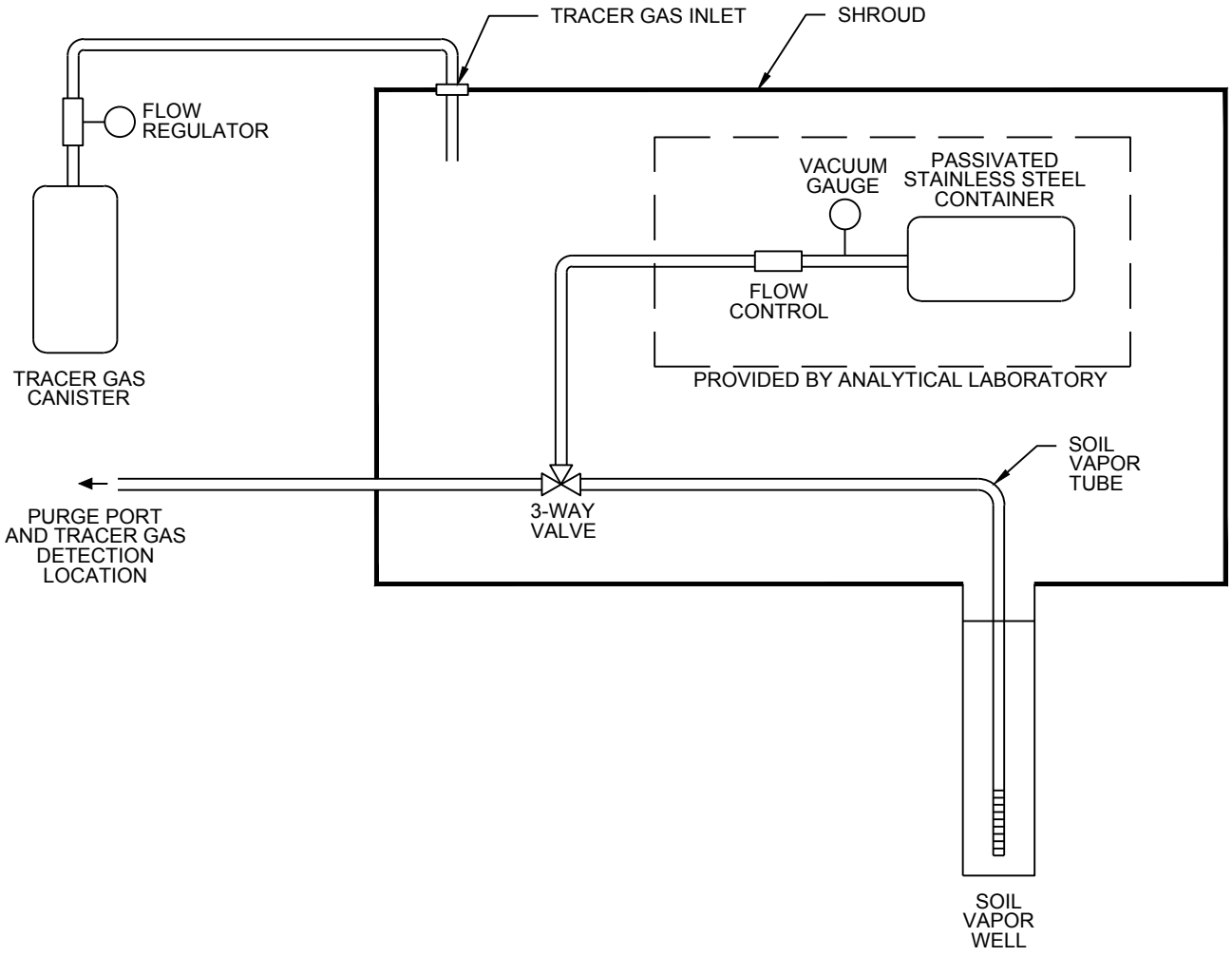
TEMPORARY SOIL VAPOR POINT DESIGN

ARCADIS

FIGURE
4



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SOIL VAPOR POINT SAMPLING TRAIN SCHEMATIC

ARCADIS

FIGURE
5

Appendix A

Air Sampling Log

ARCADIS
Infrastructure, environment, buildings

Air Sampling Log

Project Name: _____ Weather Observations: _____

Project Number: _____ Field Staff: _____

Sample ID	Sample Canister Number	Start Vacuum	Stop Vacuum	Start Date	Start Time	Stop Date	Stop Time	Start Temp	Stop Temp	Start Baro Pressure	Stop Baro Pressure

Notes: _____

_____