Associated Environmental Group, LLC

December 20, 2019

Mr. Chang Kim
23886 SE Kent-Kangley Road
Maple Valley, Washington 98038-6848
jbangiek@gmail.com

RE: **Technical Memorandum – Soil Vapor Extraction (SVE) System Installation**
4 Corners Cleaners
23886 SE Kent-Kangley Road
Maple Valley, Washington 98038-6848
AEG Project: 17-126

Dear Mr. Kim:

Associated Environmental Group, LLC (AEG) has prepared this Technical Memorandum to document the installation and monitoring of a soil vapor extraction (SVE) system to address environmental concerns for the *4 Corners Cleaners*, located at the above-referenced address in Maple Valley, Washington (Site). The scope of services for the installation and monitoring of the SVE system was presented in AEG's Cleanup Action Plan, dated May 29, 2019. The system was designed to extract and remove adsorbed vapor-phase tetrachloroethylene (PCE) and other volatile organic compounds (VOCs) from subsurface soil beneath the building, and treat the vapors using granular activated carbon (GAC). The system also mitigates the potential for vapor intrusion of VOCs detected beneath the dry cleaner space into the indoor air. This memorandum includes a summary of the installation activities, baseline startup sampling results, and recommendations for continued operations and monitoring for the Site. Figure 1, *Site Location Map*, presents the general vicinity of the Site. The Site's current layout, including soil boring and SVE extraction well locations, are illustrated in Figure 2, *Site Map*.

Background

PCE and its anaerobic sequential degradation chain constituents, including trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), trans-1,2-DCE, and vinyl chloride, are the contaminants of concern (COCs) for the Site. Soil and soil vapor are the media affected. Groundwater was encountered at various depths from 25 to 33 feet below ground surface (bgs) in six of the ten borings and did not contain detectable VOCs. Soil impacts at the Site are likely the result of use and storage of PCE formerly used in the dry cleaner machine and dry-cleaning process.

PCE was the only COC detected in soil above Model Toxics Control Act (MTCA) cleanup levels. PCE exceeded the MTCA Method A cleanup level in AEG soil samples B1-22 (1.8 feet bgs) and

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B3-23 (1.9 feet bgs). Both of these borings were located inside the building. The vertical extent of PCE in these borings could not be determined due to the very dense soils encountered and the limitations of drilling in these soils inside the building. PCE was also detected in boring B-11 at 18 feet bgs, which is outside the building to the north. Soil boring locations are illustrated in Figure 3, *PCE In Soil Plume Map*.

SVE Wells and Vapor Monitoring Points Installation

Five SVE wells were installed on August 9 and 10, 2019 by Cascade Drilling, LP (Cascade) using sonic drilling technologies. Four SVE wells (SVE-1 through SVE-4) are outside the tenant space and are 15 feet in depth with slotted screens from 2 to 15 feet bgs. SVE-5 was installed inside the tenant space using vacuum extraction to a depth of 3 feet bgs and completed with slotted screen from 6 inches to 3 feet bgs. All wells were sealed at the surface with bentonite and concrete grout.

Sub-slab vapor monitoring points (VP-1 to VP-3) were installed by drilling through the existing concrete slab, placement, and sealing of the stainless steel VaporPin® sampling points. The vapor points were completed with accessible lids in locations for easy monitoring. Vapor monitoring points and SVE well locations are illustrated in Figure 4, *SVE Well Locations Map*.

System Installation

The SVE system underground conveyance piping installation was completed in August through September 2019, and startup occurred on October 9, 2019. The system was constructed to meet the Site conditions and requirements of the property management company. The system was started with GAC filters in-place to be in compliance with the required Puget Sound Clean Air Agency (PSCAA) regulations. Figure 8, *Process & Instrumentation Diagram,* illustrates the major system components, the flow of soil vapors, and the system controls within the sound enclosure.

System Components

The system layout was designed to minimize the impact on current tenants and future use of the building by having a small footprint within a sound enclosure. The major system components provided are setup for the Site voltage of 230 volt, 60Hz, 1-phase. The system was wired for Non-Hazardous locations and was completely pre-wired, and pre-tested with appropriate piping, valves, and instrumentation to insure a minimum amount of field connections during the installation.
Major equipment includes (refer to Figure 8, *Process & Instrumentation Diagram*):

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Vacuum Blower
Regenerative Blower KO5 MS

- 2 HP 230V/1P TEFC motor
- Max Air Flow 156 CFM, Max Vacuum 3.8" Hg
- 2" Inlet Vacuum relief valve
- 2" Inlet filter
- 1" Dilution filter with adjustable 1" gate valve
- Inlet vacuum gauge 0-100" W.C.
- Inlet sample port ¼" brass
- Inlet temperature gauge 50-500F
- 2" steel discharge piping terminated 10' above grade with rain cap
- Discharge pressure gauge 0-100" W.C.
- Discharge temp gauge 50-500 F
- High Temperature Switch with alarm shutdown
- Discharge Sample port ¼" brass

Liquid Separator
MAE2 Model AWS-30,

- 30-gallon liquid separator capacity
- Marine grade aluminum construction
- Internal demister
- 2" Tangential Inlet
- 2" MPT Outlet
- Manual drain
- 2" clear PVC site tube
- Single point SS level switch assembly for high level shut off
- Vacuum gauge 0-100" W.C.
- Sample port ¼" brass
- Tank Drain ½" hose bib

Manifold
2" header with 3-2" legs each with:

- 2" brass gate valve
- Vacuum Gauge 0-100" W.C.
- Sample Port ¼" brass
- 2" FMT connection through building wall

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Vacuum Blower Nema 4 control enclosure:

- 230 VAC, single phase input power
- Nema 4 panel enclosure
- Branch circuit protection for SVE Motor, Heater, vent fan, lights, control circuit
- Motor Starter with overload for blower
- Contactors for vent fan and heater
- 1 HOA Switch for SVE motor with Green Run Light
- 1 reset push button
- 2 Red alarm light
- Alarms and interlocks for proper system operation
- LSHH, TSHH and Motor overload terminals for connection to Omnisite
- Omnisite XR50 telemetry monitor with Nema enclosure mounted next to control box

Enclosure:

Steel Frame Building:

- 4’ W x 6 L x 6 H Custom steel frame enclosure
- White aluminum siding on exterior
- Double end doors with locking hasp
- 3/8” unfinished plywood walls and ceiling on interior
- ¾” Treated plywood floor with anti-skid overlay
- 1” insulation in walls and ceiling
- 16” vent fan with remote thermostat and louver with rain hood
- (1) 16” louver opening with rain hoods
- (1) forced air heater with thermostat
- (1) 100-watt LED light fixtures with remote switch
- GFI twin courtesy outlets with rain cover mounted next to control panel
- Control panel on the exterior of the enclosure

The conveyance piping was routed in 2-foot by 2-foot by 2-foot trenches layered with clean backfill and controlled density fill (CDF) to 4 inches bgs. The trench surfaces were restored with asphalt or concrete to the existing grade and conditions. Each SVE well has an independent 2-inch PVC piping for vacuum with a control valve, sample port, and vacuum gauge. These five underground pipes are terminated in the system compound and are connected to a common header connected to the SVE blower (see the attached Site Photographs in Appendix A).

The SVE equipment is located outside of the north wall of the building inside a 4-foot by 6-foot shed that protects the system and dampens noise from the system. The blower is connected to the moisture knockout tank to protect from water that condenses in the system. The knockout tank

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includes a vacuum dilution valve that can be adjusted to regulate the amount of vacuum applied to the extraction point and a sight tube to visually determine the amount of water in the tank. A valve installed at the bottom of the knockout tank drains water from the tank as necessary. The exhaust stack pipe is routed up the exterior wall to vent approximately 4 feet above the roof line. The pipe terminates at a "T" to minimize precipitation entering the pipe. The system has a remote telemetry unit to notify AEG of any system shutdown events, power outages, or when the knockout tank reaches capacity and stops the blower vacuum.

System Performance

System performance will be evaluated by measuring the induced vacuum below the building slab, collecting inlet/outlet vapor samples, collecting sub-slab vapor samples, and monitoring indoor air quality.

On October 9, 2019, indoor and ambient air samples were collected during the system startup to establish baseline conditions. Each sample was collected over an 8-hour time period with a Summa canister equipped with a calibrated critical orifice air flow controller. The sampling time period was based on the anticipated daily exposure duration of the commercial tenant inside the building. The samples were sent to Libby Environmental, Inc. (Libby) to be analyzed for all VOCs previously detected in sub-slab vapor samples, which included methylene chloride, TCE, and PCE. Analytical results were all below the laboratory method detections limits for all constituents of concern. The results are presented in Table 2, *Summary of Indoor Air Analytical Results.*

Sub-slab vapor samples were also collected on October 9, 2019. As shown in Table 3, *Summary of Sub-Slab Vapor Analytical Results*, the air sample results indicate that PCE is present in vapor monitoring points VP-1 and VP-3 at concentrations above MTCA Method B sub-slab screening levels for PCE. An exceedance of Method B sub-slab screening levels indicates the constituent has the potential to migrate into indoor air; however, the indoor air results discussed above currently indicate that is not occurring. PCE concentrations detected in the sub-slab location VP-1 was 586 micrograms per cubic meter ($\mu g/m^3$) and 743 $\mu g/m^3$ at VP-3.

Vapor samples were collected from the inlet and exhaust of the GAC filters at system startup. A 10-minute Summa canister sample of the pre- and post-treatment exhaust (input and output, respectively) was collected to evaluate compliance with the PSCAA maximum allowable emission rates. The blower was connected to the GAC filters at startup and, based on conservative estimates of system flow (approximately 120 cubic feet per minute [CFM]) and VOC concentrations (see Table 4, *Summary of SVE System Air Analytical Results*), the VOC discharge from the stack is anticipated to be well below the maximum emission rates allowable by PSCAA regulations (500 pounds per year of PCE and 1,000 pounds per year of total toxic air pollutants). The potential to

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emit (PTE) toxic constituents is shown on Table 5, *Potential to Emit Summary,* and is based on the sample results from October 9, 2019. This data will be used to document PSCAA compliance.

To monitor efficacy of the applied vacuum to reach beneath the tenant space, on October 9, 2019 at startup and two weeks after startup, the pressure differential beneath the slab at three permanent sub-slab sampling ports was measured and compared to indoor air pressure to evaluate the system's radius of influence. The vacuum at the three sampling ports within the tenant space were measured at between 0.03 and 0.05 inches of water, which meets or exceeds the pressure reduction goal of 0.02 inches of water proposed in EPA guidance (EPA 2008). Approximate sampling port locations are shown on Figure 4, *SVE Well Locations Map*. The response to applied vacuum is shown on Table 6, *Applied Vacuum Response Monitoring*. The vacuum monitoring indicates a negative differential pressure has developed underneath the building slab around the extraction points, as compared to indoor air or ambient pressure.

Ongoing Operations and Maintenance

AEG will perform monthly O&M of the SVE system to ensure optimal effectiveness over the 12 months of expected running time.

Specific tasks to be performed include the following:

- Perform monthly SVE system evaluation, adjustment, and maintenance, including replacing fittings and other parts as needed, to provide long-term performance. For the area surrounding the Site, noise abatement must be provided for 24-hour operation. Monthly Site visits would include the following:
    - Upon arrival at the Site, notify the appropriate contact person of your presence.
    - Visually inspect the equipment compounds for obvious safety problems, i.e., unsecured compounds, un-labeled drums, etc.
    - Check all piping connections for tightness, and ensure that anchors are secure, and of appropriate design.
    - Check all gauges to ensure that they are working, readable, and clean.
    - Listen to all pumps, blowers, etc. Often the only early warning there is for a bearing going out is an increase in the pitch of the motor noise. Check and lubricate all bearing races as required. Note any out of variance occurrences.
    - If drums of waste are generated, have the appropriate labeling to identify the waste. Remove and properly dispose of any garbage, debris, etc. that has accumulated at the Site since the last visit.
    - Make a note of any other unusual circumstances.

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- Collect performance discharge vapor samples from sample ports before the vapor treatment system (GAC) and after the vapor treatment system (pre- and post-treatment vapor discharge samples). Samples of the vapor influent/effluent will be collected for laboratory analysis during each monthly O&M visit. Vapor samples will be collected in laboratory-supplied Summa canisters and submitted to a Washington State-certified laboratory for analysis for analysis for Chlorinated VOCs via TO-15 SIM.
- Collect performance sub-slab vapor samples from the three sub-slab vapor points to monitor the effectiveness of the SVE treatment. Samples of the sub-slab vapor will be collected for laboratory analysis during each monthly O&M visit. Vapor samples will be collected in laboratory-supplied Summa canisters and submitted to a Washington State-certified laboratory for analysis for analysis for Chlorinated VOCs via TO-15 SIM.
- Monitor GAC vapor treatment under specific discharge permits. Change out carbon when determined via sampling to be saturated.

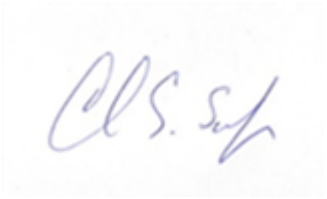
Performance monitoring will be used to predict the duration of the operation and effectiveness. The operation of the SVE system requires vapor treatment prior to discharge to the atmosphere under PSCAA permit guidelines. Provisions in the PSCAA permit require that VOC discharges not exceed the allowable thresholds for toxic air pollutants as dictated in the PSCAA Regulations. Compliance air sampling will be conducted monthly, and overall removal efficiency would need to be reported to PSCAA if any exceedances are observed.

If you have comments or questions, please contact our office at your convenience at 360.352.9835.

Sincerely,

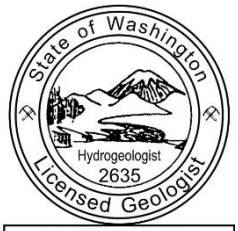
Associated Environmental Group, LLC

Prepared & Reviewed by:



Charles Swift, R.S.A.
Project Manager

Scott Rose, L.H.G.
Senior Hydrogeologist



SCOTT I ROSE

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Attachments: Figure 1 – *Site Location Map*

Figure 2 – *Site Map*

Figure 3 – *PCE In Soil Plume Map*

Figure 4 – *SVE Well Locations Map*

Figure 5 – *Site Map with Geologic Cross Sections A-A' and B-B'*

Figure 6 – *Geologic Cross Section A-A'*

Figure 7 – *Geologic Cross Section B-B'*

Figure 8 – *Process & Instrumentation Diagram*

Table 1 – *Summary of Soil Analytical Results*

Table 2 – *Summary of Indoor Air Analytical Results*

Table 3 – *Summary of Sub-Slab Vapor Analytical Results*

Table 4 – *Summary of SVE System Air Analytical Results*

Table 5 – *Potential to Emit Summary- SVE Testing Event- October 9, 2019*

Table 6 – *Applied Vacuum Response Monitoring*

Appendix A – Site Photographs,

Appendix B – Supporting Documents
Boring Logs
Laboratory Datasheets

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FIGURES

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FILENAME	DRAWN BY		CHECKED BY		APPROVED BY		PROJECT NUMBER
17-126_17Q1.DWG	ICD	3/22/2017	CS	3/22/2017	CS	3/22/2017	17-126

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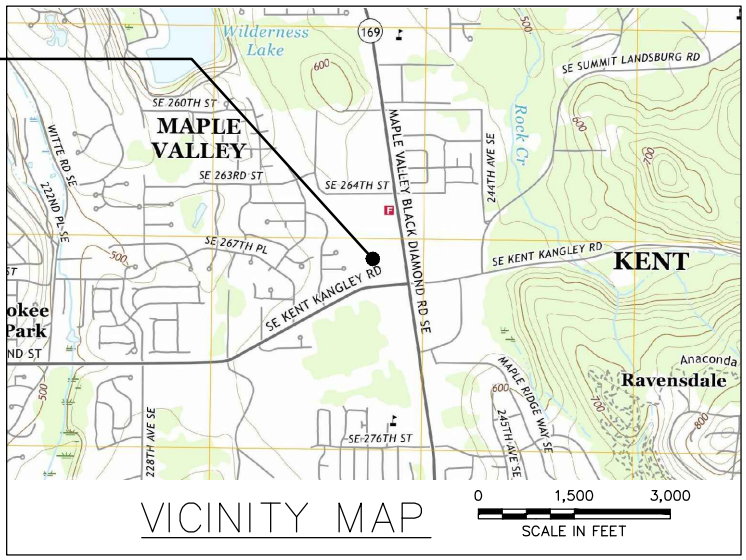
PROJECT LOCATION



VICINITY MAP

NOTES

1. THE LOCATIONS OF ALL FEATURES SHOWN ARE APPROXIMATE
2. THIS DRAWING IS FOR INFORMATION PURPOSES. IT IS INTENDED TO ASSIST IN SHOWING FEATURES DISCUSSED IN AN ATTACHED DOCUMENT.

REFERENCE

DRAWING CREATED FROM AERIAL PHOTOGRAPH AND NOTES PROVIDED BY AEG, LLC.
VICINITY IMAGE SOURCE: U.S. GEOLOGICAL SURVEY–2017, 7.5 MINUTE QUADRANGLE MAP
BLACK DIAMOND, WASHINGTON

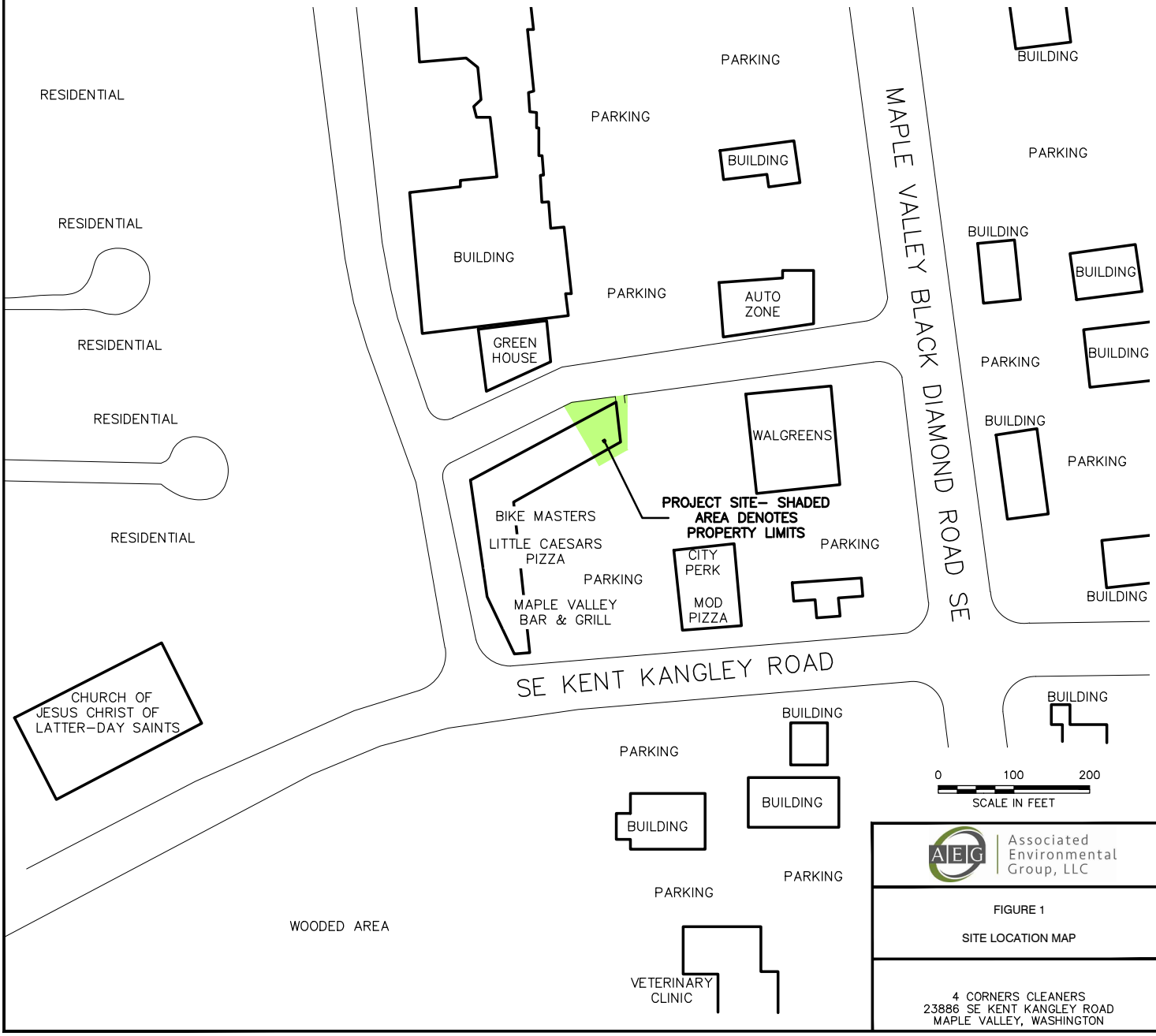


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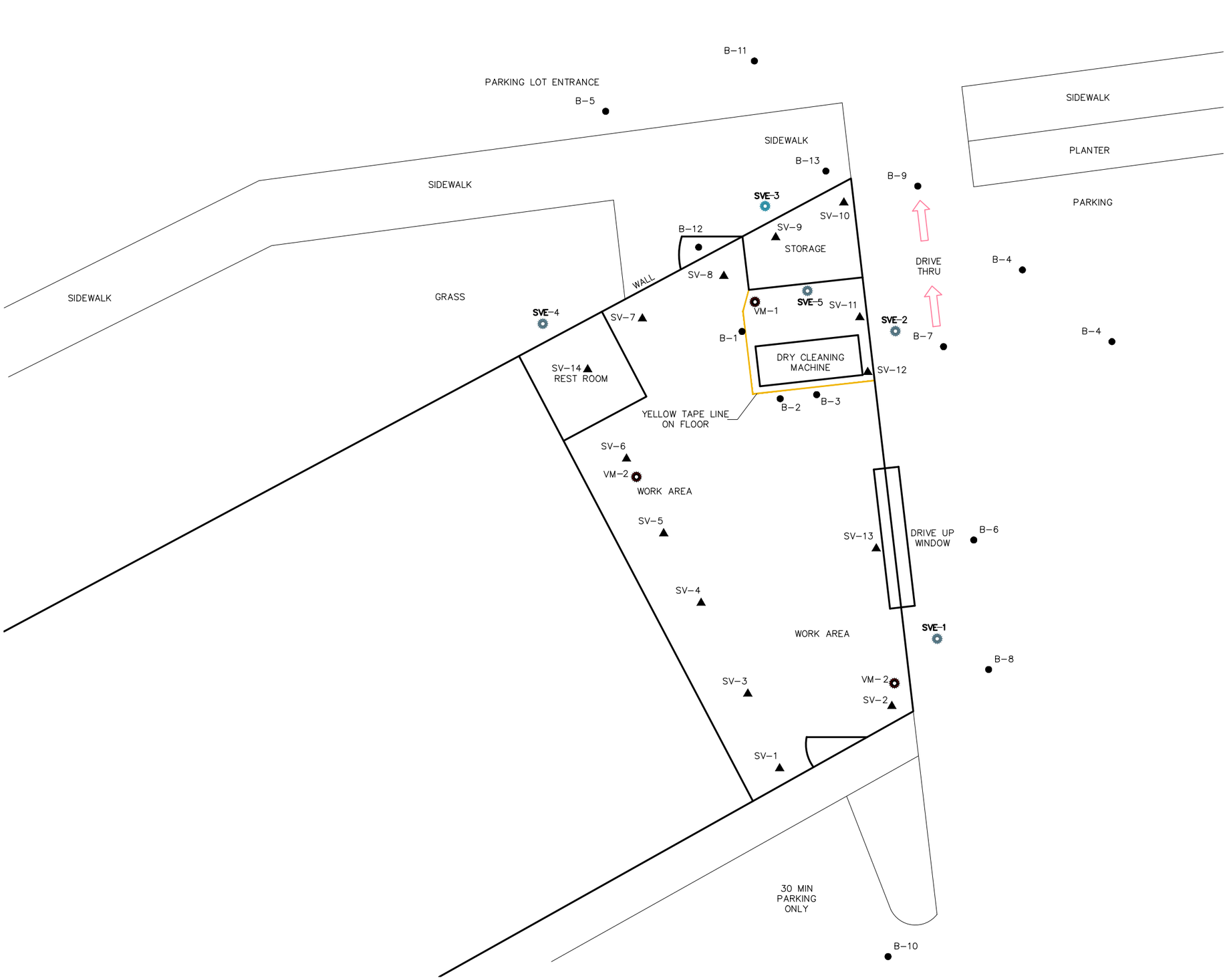
FIGURE 1

SITE LOCATION MAP

4 CORNERS CLEANERS
23886 SE KENT KANGLEY ROAD
MAPLE VALLEY, WASHINGTON

PROJECT NUMBER	17-126
APPROVED BY	BD 1/21/2019
CHECKED BY	BD 1/21/2019
DRAWN BY	ICD 1/21/2019
FILENAME	17-126_1803_1.DWG



LEGEND

B-1 ●	SOIL BORING LOCATION
SV-1 ▲	SOIL VAPOR LOCATION
SV-1 ⊙	SOIL VAPOR WELL LOCATION
VM-1 ⊙	VAPOR MONITORING WELL LOCATION

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0 5 10
SCALE IN FEET

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FIGURE 2

SITE MAP

4 CORNERS CLEANERS
23886 SE KENT KANGLEY ROAD
MAPLE VALLEY, WASHINGTON

PROJECT NUMBER	17-126
APPROVED BY	BD 1/11/2019
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DRAWN BY	ICD 1/11/2019
FILENAME	17-126_1803_1.DWG

B-5					
07/17/18					
DP	5.0'	10.0'	15.0'	25.0'	30.0'
PCE	<0.02	<0.02	<0.02	<0.02	<0.02

B-13				
07/23/18				
DP	3.0'	18.0'	35.0'	37.0'
PCE	<0.02	<0.02	<0.02	<0.02

B-11								
07/20/18								
DP	3.0'	6.0'	9.0'	15.0'	18.0'	21.0'	24.0'	33.0'
PCE	<0.02	<0.02	<0.02	<0.02	**0.053**	**0.034**	**0.046**	<0.02

B-12				
07/23/18				
DP	3.0'	18.0'	33.0'	37.0'
PCE	<0.02	<0.02	<0.02	<0.02

B-1	
03/13/17	
DP	1.8'
PCE	**0.058**

B-2	
03/13/17	
DP	1.6'
PCE	**0.044**

B-9					
07/19/18					
DP	3.0'	9.0'	15.0'	24.0'	33.0'
PCE	<0.02	<0.02	<0.02	<0.02	<0.02

B-4			
07/17/18			
DP	5.0'	10.0'	25.0'
PCE	<0.02	<0.02	<0.02

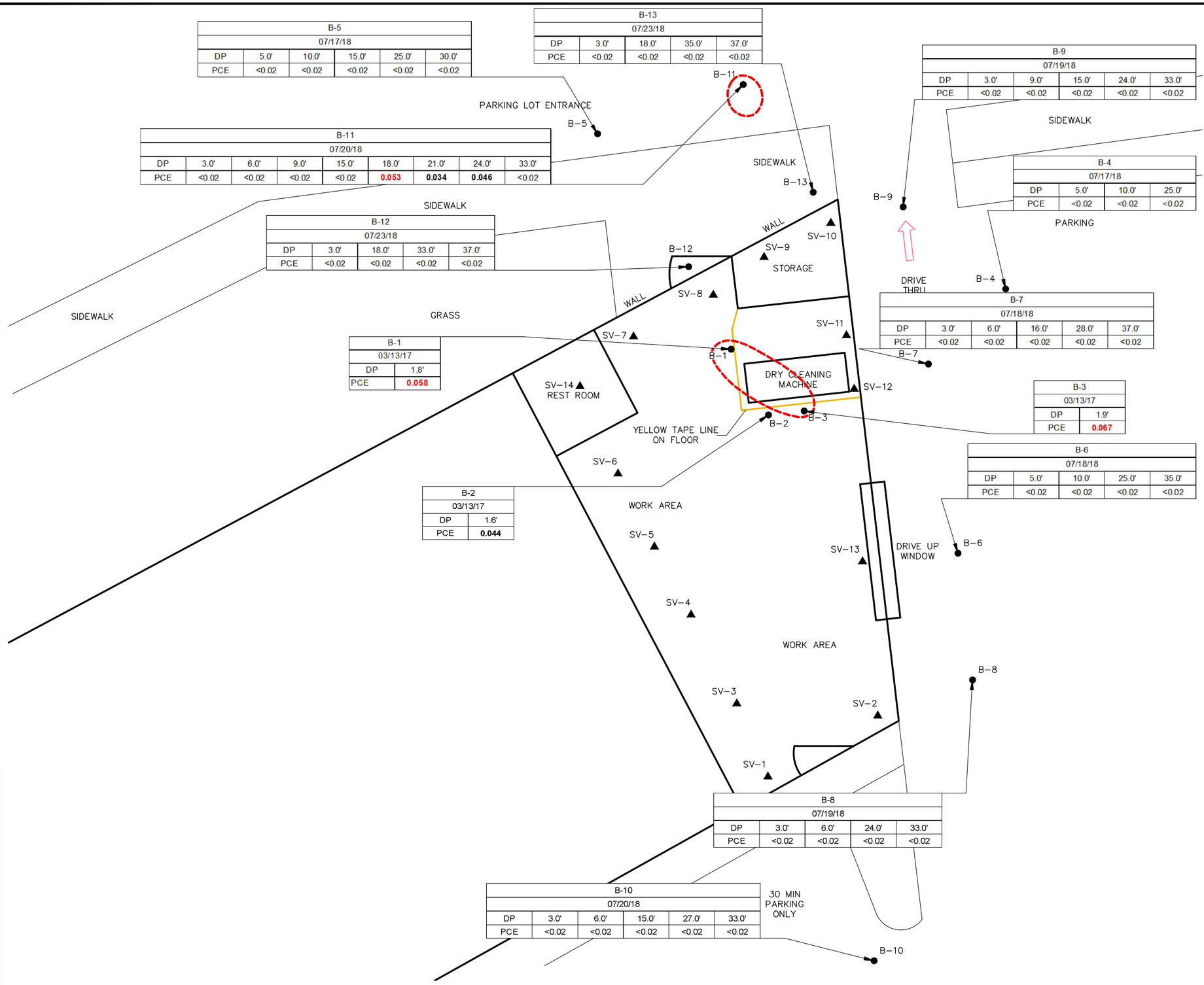
B-7					
07/18/18					
DP	3.0'	6.0'	16.0'	28.0'	37.0'
PCE	<0.02	<0.02	<0.02	<0.02	<0.02

B-3	
03/13/17	
DP	1.9'
PCE	**0.067**

B-6				
07/18/18				
DP	5.0'	10.0'	25.0'	35.0'
PCE	<0.02	<0.02	<0.02	<0.02

B-8				
07/19/18				
DP	3.0'	6.0'	24.0'	33.0'
PCE	<0.02	<0.02	<0.02	<0.02

B-10					
07/20/18					
DP	3.0'	6.0'	15.0'	27.0'	33.0'
PCE	<0.02	<0.02	<0.02	<0.02	<0.02



LEGEND

B-1 ●	SOIL BORING LOCATION
SV-1 ▲	SOIL VAPOR LOCATION
PCE	TETRACHLOROETHENE (mg/kg)
- - - - -	SOIL PCE PLUME (INDICATING EXCEEDANCE OF MTCA CUL 0.05 mg/kg)
<	NOT DETECTED ABOVE LIMIT NOTED
mg/kg	MILLIGRAMS PER KILOGRAM
DP	DEPTH IN FEET

BOLD VALUE INDICATES THE DETECTED CONCENTRATION IS BELOW ECOLOGY MTCA METHOD A CLEANUP LEVELS

RED BOLD VALUE INDICATES THE DETECTED CONCENTRATION EXCEEDS ECOLOGY MTCA METHOD A CLEANUP LEVELS

NOTES

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DRAWING CREATED FROM AERIAL PHOTOGRAPH AND NOTES PROVIDED BY AEG, LLC.

0 5 10
SCALE IN FEET

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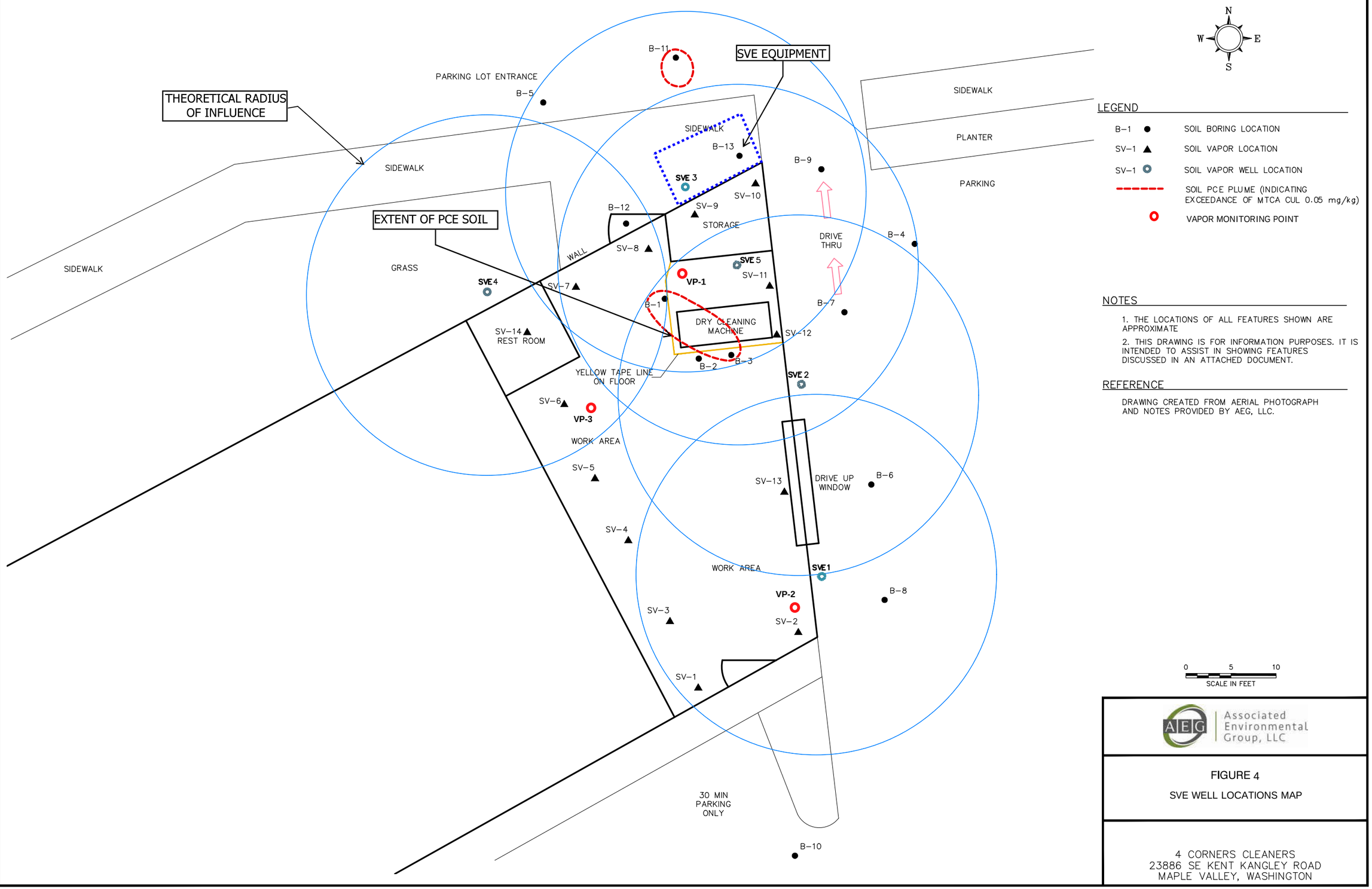
FIGURE 3

PCE IN SOIL PLUME MAP

4 CORNERS CLEANERS
23886 SE KENT KANGLEY ROAD
MAPLE VALLEY, WASHINGTON

PROJECT NUMBER	17-126
APPROVED BY	BD 1/21/2019
CHECKED BY	BD 1/21/2019
DRAWN BY	ICD 1/21/2019
FILENAME	17-126_1803_1.DWG



LEGEND

B-1 ●	SOIL BORING LOCATION
SV-1 ▲	SOIL VAPOR LOCATION
SV-1 ◎	SOIL VAPOR WELL LOCATION
- - - - - -	SOIL PCE PLUME (INDICATING EXCEEDANCE OF MTCA CUL 0.05 mg/kg)
○	VAPOR MONITORING POINT

NOTES

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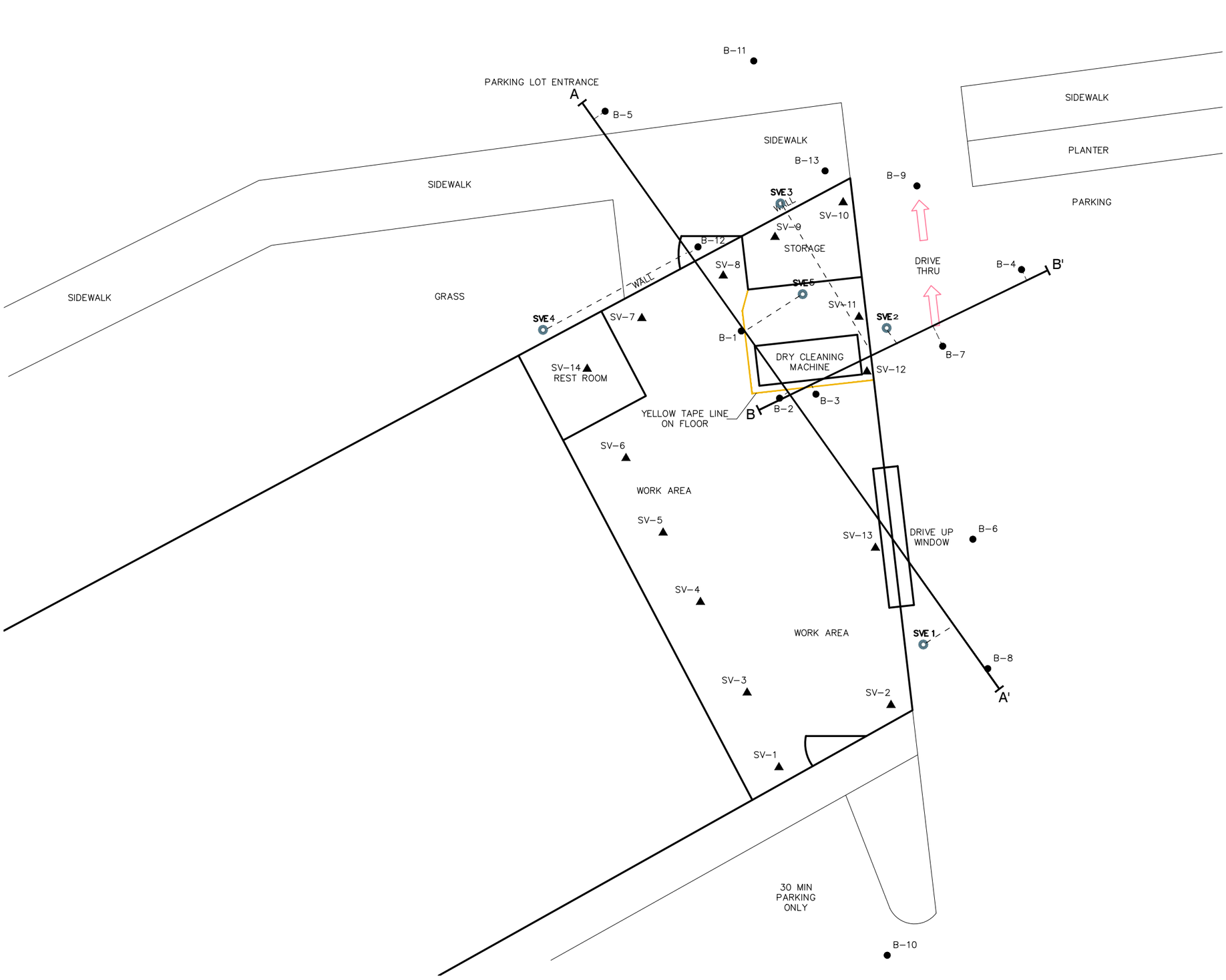
FIGURE 4

SVE WELL LOCATIONS MAP

4 CORNERS CLEANERS
23886 SE KENT KANGLEY ROAD
MAPLE VALLEY, WASHINGTON

PROJECT NUMBER	17-126
APPROVED BY	BD 1/11/2019
CHECKED BY	BD 1/11/2019
DRAWN BY	ICD 1/11/2019
FILENAME	17-126_XSECTIONS.DWG



N
W E
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LEGEND

B-1 ●	SOIL BORING LOCATION
SV-1 ▲	SOIL VAPOR LOCATION
SVE 1 ◎	SOIL VAPOR EXTRACTION WELL LOCATION
A A'	LINE OF LITHOLOGIC CROSS SECTION AND PROJECTION LINE OR BORING/WELL

NOTES

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0 5 10
SCALE IN FEET

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FIGURE 5

SITE MAP WITH GEOLOGIC CROSS SECTIONS A-A' AND B-B'

4 CORNERS CLEANERS
23886 SE KENT KANGLEY ROAD
MAPLE VALLEY, WASHINGTON

PROJECT NUMBER	APPROVED BY	CHECKED BY	DRAWN BY
17-126	BD 1/11/2019	BD 1/11/2019	ICD 1/11/2019

FILENAME: 17-126_XSECTIONS.DWG

NORTHWEST

A

SOUTHEAST

A'

B-B' LINE

BUILDING

B-5 | B-12 | B-1 | B-2 | B-8

SVE-4 | SVE-5 | SVE-1

DEPTH BELOW GROUND SURFACE (FEET)

0 | 10 | 20 | 30 | 40

B-1	
03/13/17	
DP	1.8'
PCE	**0.058**

B-2	
03/13/17	
DP	1.6'
TPH-d	**0.044**

HORIZONTAL SCALE: 0 2.5 5

VERTICAL SCALE: 0 5 10

LEGEND

B-2 – SOIL BORING

– GROUNDWATER LEVEL AT TIME OF DRILLING

– MAXIMUM DEPTH EXPLORED

– SOIL CONTACT

SANDY GRAVEL

GRAVELLY SILT

PCE	TETRACHLOROETHENE (mg/kg)
<	NOT DETECTED ABOVE LIMIT NOTED
mg/kg	MILLIGRAMS PER KILOGRAM
DP	DEPTH IN FEET

BOLD VALUE INDICATES THE DETECTED CONCENTRATION IS BELOW ECOLOGY MTCA METHOD A CLEANUP LEVELS

RED BOLD VALUE INDICATES THE DETECTED CONCENTRATION EXCEEDS ECOLOGY MTCA METHOD A CLEANUP LEVELS

AEG Associated Environmental Group, LLC

FIGURE 6

GEOLOGIC CROSS SECTION A-A'

4 CORNERS CLEANERS
23886 SE KENT KANGLEY ROAD
MAPLE VALLEY, WASHINGTON

FILENAME	DRAWN BY	CHECKED BY	APPROVED BY	PROJECT NUMBER
17-126_XSECTIONS.DWG	ICD 1/11/2019	BD 1/11/2019	BD 1/11/2019	17-126

SOUTHWEST

B

A–A' LINE

BUILDING

B–2 B–3 B–7 B–4

SVE-3 SVE-2

NORTHEAST

B'

DEPTH BELOW GROUND SURFACE (FEET)

0 10 20 30 40

B-2	
03/13/17	
DP	1.6'
PCE	**0.044**

B-3	
03/13/17	
DP	1.9'
PCE	**0.067**

LEGEND

B–2 – SOIL BORING

– GROUNDWATER LEVEL AT TIME OF DRILLING

– MAXIMUM DEPTH EXPLORED

– SOIL CONTACT

SANDY GRAVEL

GRAVELLY SILT

PCE	TETRACHLOROETHENE (mg/kg)
<	NOT DETECTED ABOVE LIMIT NOTED
mg/kg	MILLIGRAMS PER KILOGRAM
DP	DEPTH IN FEET

BOLD VALUE INDICATES THE DETECTED CONCENTRATION IS BELOW ECOLOGY MTCA METHOD A CLEANUP LEVELS

RED BOLD VALUE INDICATES THE DETECTED CONCENTRATION EXCEEDS ECOLOGY MTCA METHOD A CLEANUP LEVELS

0 2.5 5
HORIZONTAL SCALE

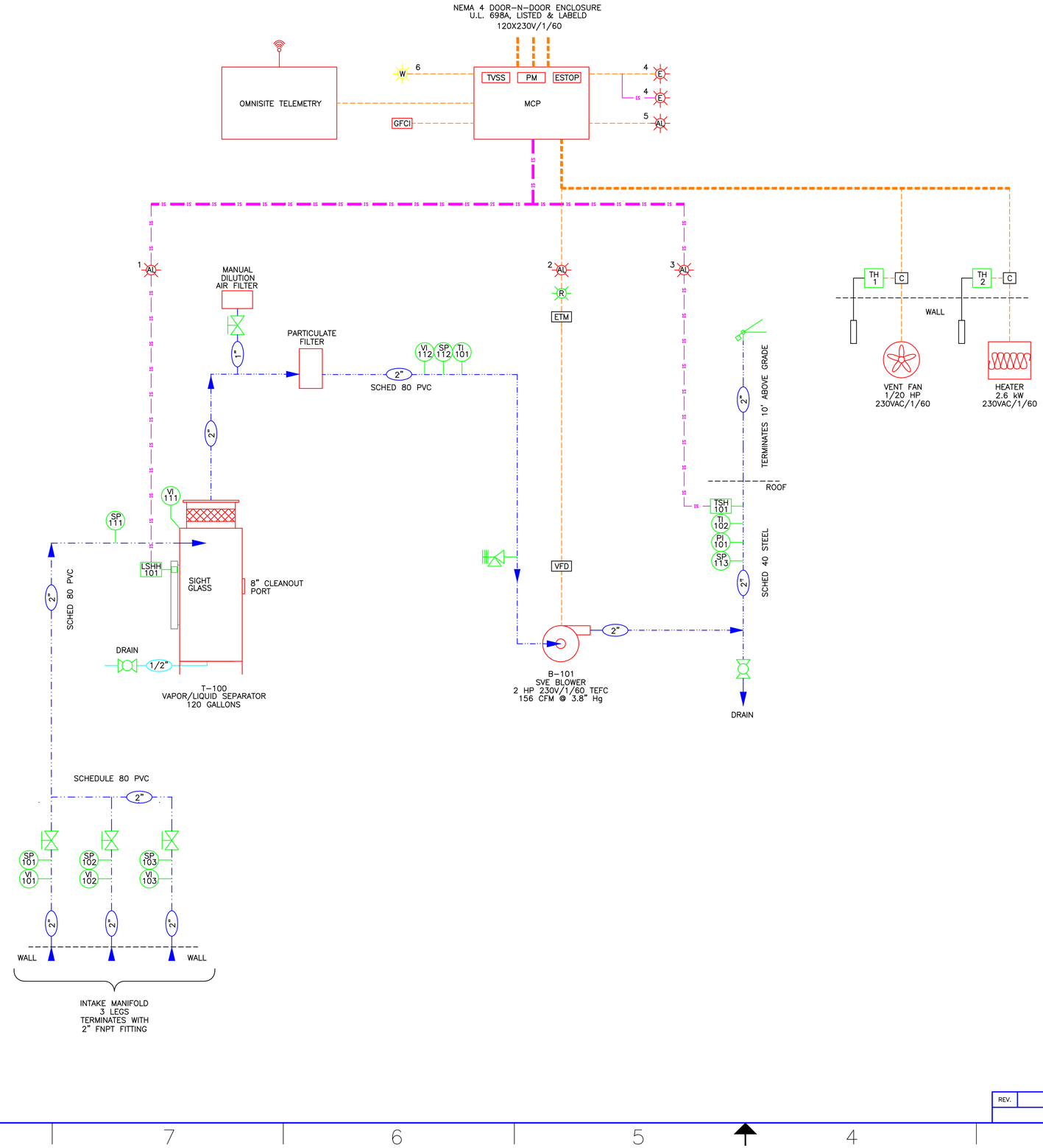
0 5 10
VERTICAL SCALE

AEG Associated Environmental Group, LLC

FIGURE 7

GEOLOGIC CROSS SECTION B-B'

4 CORNERS CLEANERS
23886 SE KENT KANGLEY ROAD
MAPLE VALLEY, WASHINGTON



LEGEND

C	CONTACTOR
ETM	ELAPSED TIME METER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
LSHH	LEVEL SWITCH HIGH HIGH
MCP	MASTER CONTROL PANEL
PI	PRESSURE INDICATOR
PM	PHASE/VOLTAGE MONITOR
SP	SAMPLE PORT
TH	THERMOSTAT
TI	TEMPERATURE INDICATOR
TSH	TEMPERATURE SWITCH HIGH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESOR
VFD	VARIABLE FREQUENCY DRIVE
VI	VACUUM INDICATOR

- BALL VALVE
- CHECK VALVE
- GATE VALVE
- RAIN CAP
- RELIEF VALVE
- WYE STRAINER

- W — WARNING LIGHT
- AL — ALARM LIGHT
- E — EMERGENCY STOP LIGHT
- R — RUN LIGHT
- AIR LINE
- BREAK
- CONTROL LINE
- IS — INTRINSICALLY SAFE LINE
- AL — INTRINSICALLY SAFE ANALOG LINE
- AL — NON-INTRINSICALLY SAFE ANALOG LINE
- PRODUCT LINE
- WATER LINE

ALARMS

1. VAPOR/LIQUID SEPARATOR HIGH HIGH LEVEL
2. SVE BLOWER MOTOR FAULT
3. SVE HIGH TEMPERATURE
4. EMERGENCY STOP
5. PHASE/VOLTAGE FAULT
6. TVSS DEPLETED

REV.	DESCRIPTION	DATE	APPR.
	REVISIONS		

FIGURE 8

MID-ATLANTIC ENVIRONMENTAL EQUIPMENT, INC.
15 Carroll Drive
Bluffton, SC 29910
(843) 836-1804

TITLE	PROCESS & INSTRUMENTAION DIAGRAM
DRAWN BY / DATE	GWL 6/14/19
CHK BY / DATE	
APPR BY / DATE	
ASSOCIATED ENVIRONMENTAL GROUP, LLC 4 CORNERS DRY CLEANERS	JOB NO. 25196
SCALE N/A	SIZE D
DWG NO. 25196GLP	SHEET 1 OF 1
REV PRELIM	

TABLES

2633 Parkmont Lane SW, Suite A • Olympia, WA • 98502
Phone: 360-352-9835 • Fax: 360-352-8164 • Email: admin@aegwa.com

Table 1 - Summary of Soil Analytical Results
4 Corners Dry Cleaning
Maple Valley, Washington

Sample Number	Depth Collected (feet)	Date Collected	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride
B1-22	1.8	3/13/2017	**0.058**	<0.02	<0.05	<0.05	<0.02
B2-20	1.6	3/13/2017	**0.044**	<0.02	<0.05	<0.05	<0.02
B3-23	1.9	3/13/2017	**0.067**	<0.02	<0.05	<0.05	<0.02
B4-5	5.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B4-10	10.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B4-25	25.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B5-5	5.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B5-10	10.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B5-15	15.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B5-25	25.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B5-30	30.0	7/17/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B6-5	5.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B6-10	10.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B6-25	25.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B6-35	35.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B7-3	3.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B7-6	6.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B7-16	16.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B7-28	28.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B7-37	37.0	7/18/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B8-3	3.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B8-6	6.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B8-24	24.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B8-33	33.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B9-3	3.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B9-9	9.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B9-15	15.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B9-24	24.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B9-33	33.0	7/19/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B10-3	3.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B10-6	6.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B10-15	15.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B10-27	27.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B10-33	33.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02

Table 1 - Summary of Soil Analytical Results
4 Corners Dry Cleaning
Maple Valley, Washington

Sample Number	Depth Collected (feet)	Date Collected	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride
B11-3	3.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B11-6	6.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B11-9	9.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B11-15	15.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B11-18	18.0	7/20/2018	**0.053**	<0.02	<0.05	<0.05	<0.02
B11-21	21.0	7/20/2018	**0.034**	<0.02	<0.05	<0.05	<0.02
B11-24	24.0	7/20/2018	**0.046**	<0.02	<0.05	<0.05	<0.02
B11-33	33.0	7/20/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B12-3	3.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B12-18	18.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B12-33	33.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B12-37	37.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B13-3	3.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B13-18	18.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B13-35	35.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
B13-37	37.0	7/23/2018	<0.02	<0.02	<0.05	<0.05	<0.02
PQL			0.02	0.02	0.05	0.05	0.02
MTCA Method A Cleanup Levels			0.05	0.03	160*	1,600*	0.67*

Notes:
All values are presented in milligrams per kilogram (mg/kg)
< = Not detected at the listed laboratory detection limits
PQL = Practical Quantification Limit (laboratory detection limit)
*Method B cleanup level for direct contact; no Method A cleanup has been established.
Red Bold indicates the detected concentration exceeds Ecology MTCA Method A cleanup level
Bold indicates the detected concentration is below Ecology MTCA Method A cleanup levels
PCE = Tetrachloroethene
TCE = Trichloroethene
DCE = Dichloroethene

Table 2 - Summary of Indoor Air Analytical Results
4 Corners Dry Cleaners
Maple Valley, WA

Sample ID		Indoor	Ambient	Method B Indoor Air Cleanup Level
Date Collected		10/9/2019	10/9/2019	
TO-15 - Volatile Organic Compounds	Vinyl Chloride	<0.256	<0.256	0.28*
	trans-1,2-Dichloroethene	<0.396	<0.396	NL
	cis-1,2-Dichloroethene	<0.396	<0.396	NL
	Trichloroethene (TCE)	<0.537	<0.537	0.37*
	Tetrachloroethene (PCE)	<1.02	<0.256	9.62*

Notes:

All values presented in micrograms per cubic meter ($\mu g/m^3$)

-- = Not analyzed for constituent

< = Not detected above laboratory limits

* Cancer cleanup/screening level (all other constituents listed have non-cancer values)

Bold indicates the detected concentration is below Ecology MTCA Method B cleanup or screening levels

Red Bold indicates the detected concentration exceeds Ecology MTCA Method B cleanup or screening levels

NL = Not Listed; no cleanup/screening levels have been promulgated for these constituents

Table 3 - Summary of Sub-Slab Vapor Analytical Results
4 Corners Cleaners
Maple Valley, Washington

Sample Number	Depth Collected (feet)	Date Collected	PCE and Daughter Products					Other Detected Volatile Organic Compounds		
			PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	Chloroform	Dichloro-difluoromethane	1,1,2-Trichloroethane
SV-1	SUB-SLAB	3/31/2017	**1,600**	<10	<10	<10	<10	<10	<10	<10
SV-2	SUB-SLAB	3/31/2017	**1,800**	<10	<10	<10	<10	<10	**8,600**	<10
SV-3	SUB-SLAB	3/31/2017	**1,500**	<10	<10	<10	<10	<10	**12,000**	<10
SV-4	SUB-SLAB	3/31/2017	**790**	<10	<10	<10	<10	<10	**15,000**	<10
SV-5	SUB-SLAB	3/31/2017	**940**	<10	<10	<10	<10	<10	**8,200**	<10
SV-6	SUB-SLAB	3/31/2017	**850**	<10	<10	<10	<10	<10	**7,200**	<10
SV-7	SUB-SLAB	3/31/2017	**1,700**	<10	<10	<10	<10	<10	**870**	<10
SV-8	SUB-SLAB	3/31/2017	**1,100**	<10	<10	<10	<10	<10	**290**	<10
SV-9	SUB-SLAB	3/31/2017	**2,800**	<10	<10	<10	<10	**310**	**2,500**	<10
SV-10	SUB-SLAB	3/31/2017	**2,100**	<10	<10	<10	<10	**31,000**	**3,100**	**380**
SV-11	SUB-SLAB	3/31/2017	**6,300**	<10	<10	<10	<10	<10	**2,800**	<10
SV-12	SUB-SLAB	3/31/2017	**2,600**	<10	<10	<10	<10	<10	**3,400**	<10
SV-13	SUB-SLAB	3/31/2017	**180**	<10	<10	<10	<10	<10	**9,000**	<10
SV-14	SUB-SLAB	3/31/2017	**2,600**	<10	<10	<10	<10	<10	**610**	<10
SVE SYSTEM STARTUP OCTOBER 9, 2019										
VP-1[1]	SUB-SLAB	10/9/2019	**586**	**4.48**	<0.793	<0.793	<0.511	--	**--**	--
VP-2[1]	SUB-SLAB	10/9/2019	<2.03	<1.07	<0.793	<0.793	<0.511	--	**--**	--
VP-3[1]	SUB-SLAB	10/9/2019	**743**	**1.32**	<0.793	<0.793	<0.511	--	**--**	--
PQL			10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
MTCA Method B Sub-Slab Screening Levels			321	12.3	NL	NL	9.33	3.62	1,520	5.21

Notes:
[1] - Collected from the permanent vapor monitoring point.
All values are presented in micrograms per cubic meter (µg/m³)
< = Not detected at the listed laboratory detection limits
PQL = Practical Quantification Limit (laboratory detection limit)
PCE = Tetrachloroethene
TCE = Trichloroethene
DCE = Dichloroethene
NL = Not Listed; no sub-slab screening levels have been established for this constituent/
Red Bold indicates the detected concentration exceeds Ecology MTCA Method B sub-slab screening level
Bold indicates the detected concentration is below Ecology MTCA Method B sub-slab screening levels

Table 4 - Summary of SVE System Air Analytical Results
4 Corners Dry Cleaners
Maple Valley, WA

Sample ID		INPUT	OUTPUT	Method B Indoor Air Cleanup Level	Method B Sub-Slab Screening Level
Date Collected		10/9/2019	10/9/2019		
TO-15 - Volatile Organic Compounds	Vinyl Chloride	<0.511	<0.511	0.28*	9.33*
	trans-1,2-Dichloroethene	<0.793	<0.793	NL	NL
	cis-1,2-Dichloroethene	**2.19**	<0.793	NL	NL
	Trichloroethene (TCE)	**4.48**	<1.07	0.37*	12.3*
	Tetrachloroethene (PCE)	**10.3**	<2.03	9.62*	321*

Notes:

All values presented in micrograms per cubic meter ($\mu g/m^3$)

-- = Not analyzed for constituent

< = Not detected above laboratory limits

* Cancer cleanup/screening level (all other constituents listed have non-cancer values)

Bold indicates the detected concentration is below Ecology MTCA Method B cleanup or screening levels

Red Bold indicates the detected concentration exceeds Ecology MTCA Method B cleanup or screening levels

NL = Not Listed; no cleanup/screening levels have been promulgated for these constituents

TABLE 5
Potential to Emit Summary
SVE Testing Event - October 9, 2019
4 Corners Cleaners, Maple Valley, Washington

Date	Sample ID	Contaminant	Laboratory Sample Results parts per million volume (ppmv)	Molecular Weight (1) grams per - mole (g/mole)	Flowrate Measured (2) cubic feet per minute (cfm)	Potential To Emit Estimated pounds per day (lb/day)	*Maximum Allowable Emission Rate pounds per day (lb/day)
10/9/2019 (startup)	**INPUT** 14:58:00 Flow Temp = 60 F 40-inches W.C. Total System Vacuum	Tetrachloroethene (PCE)	0.00152	165.85	120	0.0001114	***2.74***
		Trichloroethene (TCE)	0.00090	131.4	120	0.0000522	***1.37***
		cis-1,2-Dichloroethene	0.00055	96.95	120	0.0000237	***2.74***
10/9/2019 (startup)	**OUTPUT** 14:05:00 Flow Temp = 100 F 40-inches W.C. Total System Vacuum	Tetrachloroethene (PCE)	0.00000	165.85	120	0.0000000	***2.74***
		Trichloroethene (TCE)	0.00000	131.4	120	0.0000000	***1.37***
		cis-1,2-Dichloroethene	0.00000	96.95	120	0.0000000	***2.74***
					Estimated Total Pounds of Total HVOCs Removed per Day		**0.000187**

Notes:

CFM = Flow rate of gas (standard cubic feet per minute)

PPMV = Concentration of gas in parts per million by volume

1 Pound = 453.6 grams

1 Liter = 0.03531 cubic feet

1 Mole of gas = 24.46 Liters volume at STP (77"F and 29.92 "w.c.)

ft/min = feet per minute

inches W.C. = Inches of Water Column

* PSCAA Maximum Allowable Emission Rate for soil and groundwater remediation projects involving <15 pounds per year of benzene or vinyl chloride, <500 pounds per year of perchloroethylene (PCE) , and <1,000 pounds per year of toxic air contaminants. *(ref. PSCAA, Regulation I, Section 6.03)*

TO CALCULATE TOTAL POUNDS REMOVED:

TOTAL LBS REMOVED = **MW** g / 1 mole x 1 lb / 453.6 g x 1 mole / 24.46 std L x 1 L / 0.03531 cu ft x **SCFM** std cu ft / min x **CONC** ppmv / $1x10^6$ /ppmv

(1) = Taken from the National Institute for Occupational Safety and Health (NIOSH) Pocket Guide to Chemical Hazards.
(2) = Velocity estimated from FPZ Blower Model SCL-K05 flow curves based on 40 inches W.C. vacuum at the system inlet.

Table 6 - Applied Vacuum Response Monitoring
4 Corners Dry Cleaners
Maple Valley, WA

Vacuum Monitoring Point	Date	Measured Response (Inches W.C.)[1]	EPA Pressure Reduction Goal (Inches W.C.)[2]
VP-1	10/9/2019	0.04	0.02
	10/24/2019	0.05	0.02
VP-2	10/9/2019	0.05	0.02
	10/24/2019	0.03	0.02
VP-3	10/9/2019	0.04	0.02
	10/24/2019	0.03	0.02

Notes:

All values presented in inches of water column (Inches W.C.)

[1] Readings from permanent vapor monitoring points inside the building (Dwyer Series 2001 Magnehelic gage).

[2] EPA-600-R-08115 Engineering Issue: *Indoor Air Vapor Intrusion Mitigation Approches* , October 2008

-- = Not measured

APPENDIX A

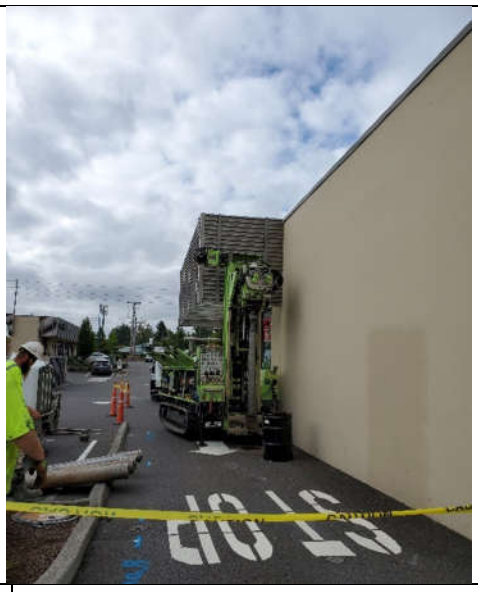
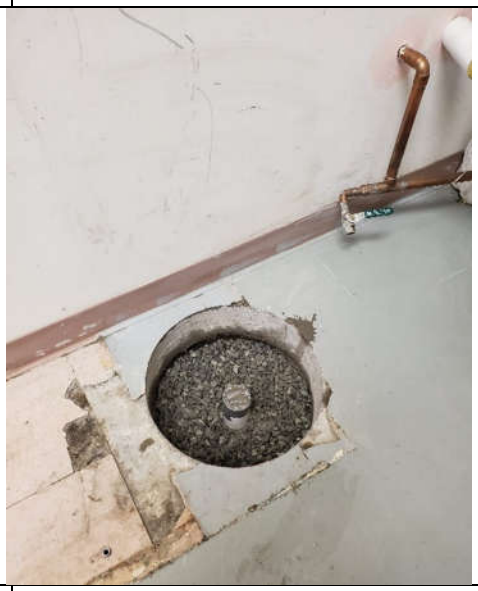
Site Photographs

2633 Parkmont Lane SW, Suite A • Olympia, WA • 98502
Phone: 360-352-9835 • Fax: 360-352-8164 • Email: admin@aegwa.com

Associated Environmental Group, LLC

SITE PHOTOGRAPHIC RECORD

Project No.: 4 Corners Cleaners **Project Name: 17-126**

			
Photo #1:	Installation of extraction well SVE-1 (facing south).	Photo #2:	Installation of extraction well SVE-2 (facing south).
			
Photo #2:	Installation of extraction well SVE-4 in the planter area (facing south east).	Photo #4:	Installation of extraction well SVE-5 inside the building.

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Associated Environmental Group, LLC

SITE PHOTOGRAPHIC RECORD

Project No.: 4 Corners Cleaners **Project Name: 17-126**

<table>
<tr><td colspan="2">  </td><td colspan="2"> 
</td></tr>
<tr><td>Photo #5:</td><td>Sawing cutting trenches and beginning the modification of SVE-1 (facing north).</td><td>Photo #6:</td><td>Asphalt removal and beginning of trench excavation (facing south).</td></tr>
<tr><td colspan="2"> 
</td><td colspan="2">  </td></tr>
<tr><td>Photo #7:</td><td>Vacuum excavation used to complete trenches extraction well SVE-3 shown (facing west).</td><td>Photo #8:</td><td>Typical extraction well connection to PVC conveyance piping (SVE-1 facing south).</td></tr>
</table>

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Associated Environmental Group, LLC

SITE PHOTOGRAPHIC RECORD

Project No.: 4 Corners Cleaners **Project Name: 17-126**

<table>
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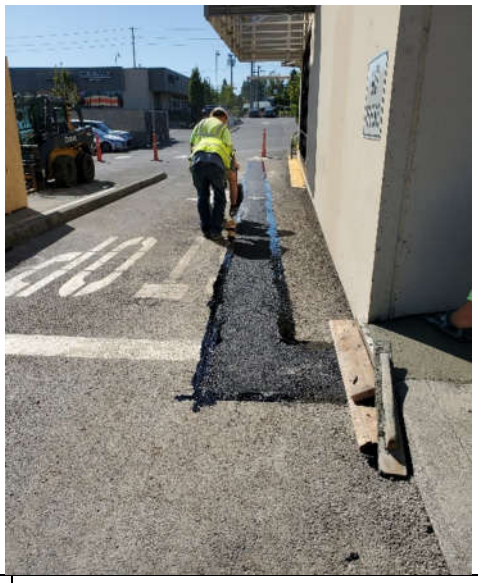
</td><td colspan="2">  </td></tr>
<tr><td>Photo #9:</td><td>Installation of CDF in the trenches before final concrete or asphalt (well manifold facing west).</td><td>Photo #10:</td><td>Asphalt installation finished to existing grade (facing south).</td></tr>
<tr><td colspan="2">  </td><td colspan="2">  </td></tr>
<tr><td>Photo #11:</td><td>SVE well control valve manifold.</td><td>Photo #12:</td><td>Vacuum applied to extraction well SVE-5 (~19 to 20 inches water column vacuum).</td></tr>
</table>

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Associated Environmental Group, LLC

SITE PHOTOGRAPHIC RECORD

Project No.: 4 Corners Cleaners **Project Name: 17-126**

			
Photo #13:	Site drive thru restored to existing condition.	Photo #14:	Final fencing and all piping attached to the building painted to match existing color.
			
Photo #15:	Final gates installed (facing south east)	Photo #16:	SVE sound enclosure in-place, connected to extraction wells and all power on.

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APPENDIX B

Supporting Documents:

Boring Logs

Laboratory Datasheets

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Associated Environmental Group, LLC

LOG OF BOREHOLE

PROJECT: *4 Corners Cleaners*	**JOB # *17-126***	**BORING #** *SVE-1*	**PAGE 1 OF 1**
Location: *23886 SE Kent Kangley Road, Maple Valley, WA*	**Approximate Elevation:**		
Subcontractor / Driller: Cascade/ Tim	**Equipment / Drilling Method: Sonic**		
Date: *August 9, 2019*	**Logged By:** *B. Dilba*		

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well Construction
	Asphalt underlain by;									
	at 3.0 feet; brown, moist, medium stiff, **GRAVELY SILT**; fine to medim grain grvel									
5	at 5.0 feet; gray, dry, dense, **SANDY GRAVEL**; fine to medium grain sand, fine to coarse grain gravel with cobbles									
10										
15										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement (AT)

Monitoring Well Construction

- Grout/Concrete
- 3/4-inch bentonite chips
- Silica sand
- 4-inch diameter blank PVC casing from
- 4-inch diameter PVC 0.01 slotted screen

Ecology Tag # BLW 343

Associated Environmental Group, LLC

LOG OF BOREHOLE

PROJECT: *4 Corners Cleaners*	**JOB # *17-126***	**BORING #** *SVE-2*	**PAGE 1 OF 1**
Location: *23886 SE Kent Kangley Road, Maple Valley, WA*	**Approximate Elevation:**		
Subcontractor / Driller: Cascade/ Tim	**Equipment / Drilling Method: Sonic**		
Date: *August 9, 2019*	**Logged By:** *B. Dilba*		

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well Construction
	Asphalt underlain by;									
	at 3.0 feet; brown, moist, medium stiff, **GRAVELY SILT**; fine to medim grain grvel									
5	at 5.0 feet; gray, dry, dense, **SANDY GRAVEL**; fine to medium grain sand, fine to coarse grain gravel with cobbles									
10										
15										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement (AT)

Monitoring Well Construction

- Grout/Concrete
- 3/4-inch bentonite chips
- Silica sand
- 4-inch diameter blank PVC casing from
- 4-inch diameter PVC 0.01 slotted screen

Ecology Tag # BLW 344

Associated Environmental Group, LLC

LOG OF BOREHOLE

PROJECT: *4 Corners Cleaners*	**JOB # *17-126***	**BORING #** *SVE-3*	**PAGE 1 OF 1**
Location: *23886 SE Kent Kangley Road, Maple Valley, WA*	**Approximate Elevation:**		
Subcontractor / Driller: Cascade/ Tim	**Equipment / Drilling Method: Sonic**		
Date: *August 9, 2019*	**Logged By:** *B. Dilba*		

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well Construction
	Asphalt underlain by;									
	at 3.0 feet; brown, moist, medium stiff, **GRAVELY SILT**; fine to medim grain grvel									
5	at 5.0 feet; gray, dry, dense, **SANDY GRAVEL**; fine to medium grain sand, fine to coarse grain gravel with cobbles									
10										
15										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement (AT)

Monitoring Well Construction

- Grout/Concrete
- 3/4-inch bentonite chips
- Silica sand
- 4-inch diameter blank PVC casing from
- 4-inch diameter PVC 0.01 slotted screen

Ecology Tag # BLW 345

Associated Environmental Group, LLC

LOG OF BOREHOLE

PROJECT: *4 Corners Cleaners*	**JOB # *17-126***	**BORING #** *SVE-4*	**PAGE 1 OF 1**
Location: *23886 SE Kent Kangley Road, Maple Valley, WA*	**Approximate Elevation:**		
Subcontractor / Driller: Cascade/ Tim	**Equipment / Drilling Method: Sonic**		
Date: *August 9, 2019*	**Logged By:** *B. Dilba*		

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well Construction
	Soil/bark chips underlain by;									
	at 3.0 feet; brown, moist, medium stiff, **GRAVELY SILT**; fine to medim grain grvel									
5	at 5.0 feet; gray, dry, dense, **SANDY GRAVEL**; fine to medium grain sand, fine to coarse grain gravel with cobbles									
10										
15										

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement (AT)

Monitoring Well Construction

- Grout/Concrete
- 3/4-inch bentonite chips
- Silica sand
- 4-inch diameter blank PVC casing from
- 4-inch diameter PVC 0.01 slotted screen

Ecology Tag # BLW 346

Associated Environmental Group, LLC

LOG OF BOREHOLE

PROJECT:	***4 Corners Cleaners***	**JOB # *17-126***	**BORING #** *SVE-5* **PAGE 1 OF 1**
Location:	*23886 SE Kent Kangley Road, Maple Valley, WA*	**Approximate Elevation:**	
Subcontractor / Driller:	Cascade/ Tim	**Equipment / Drilling Method:**	**Air Knife (vacuum truck)**
Date:	*August 10, 2019*	**Logged By:**	*B. Dilba*

Boring Depth (feet)	Soil Description	Unified Soil Symbol	Sample Depth	Sample Recovery	Sample Number	Time	Blows/Foot	PID Reading	Sheen	Monitoring Well Construction
	Concrete floor underlain by;									
	GRAVELs; coarse grain gravel with sands									

Explanation

- Sample Advance / Recovery
- No Recovery
- Contact located approximately
- Groundwater level at time of drilling or date of measurement (AT)

Monitoring Well Construction

- Grout/Concrete
- 3/4-inch bentonite chips
- Silica sand
- 4-inch diameter blank PVC casing from
- 4-inch diameter PVC 0.01 slotted screen

Libby Environmental, Inc.
3322 South Bay Road NE • Olympia, WA 98506-2957

October 22, 2019

Becky Dilba
Associated Environmental Group, LLC
2633 Parkmont Lane SW, Suite A
Olympia, WA 98502

Dear Ms. Dilba:

Please find enclosed the analytical data report for the 4 Corners Cleaners Project located in Maple Valley, Washington.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. The sample(s) will be disposed of in 30 days unless we are contacted to arrange long term storage.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry L. Chilcutt
Senior Chemist
Libby Environmental, Inc.

Phone (360) 352-2110 • Fax (360) 352-4154 • libbyenv@gmail.com

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Libby Environmental
Sherry Chilcutt
3322 South Bay Road NE
Olympia, WA 98506

RE: 4 Corners Cleaners
Work Order Number: 1910186

October 22, 2019

Attention Sherry Chilcutt:

Fremont Analytical, Inc. received 7 sample(s) on 10/11/2019 for the analyses presented in the following report.

Volatile Organic Compounds by EPA Method TO-15

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

Date: *10/22/2019*

CLIENT: Libby Environmental
Project: 4 Corners Cleaners
Work Order: 1910186

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1910186-001	VP-3	10/09/2019 1:49 PM	10/11/2019 10:32 AM
1910186-002	VP-2	10/09/2019 1:45 PM	10/11/2019 10:32 AM
1910186-003	Input	10/09/2019 2:58 PM	10/11/2019 10:32 AM
1910186-004	VP-1	10/09/2019 1:40 PM	10/11/2019 10:32 AM
1910186-005	Output	10/09/2019 2:05 PM	10/11/2019 10:32 AM
1910186-006	Outdoor	10/09/2019 6:10 PM	10/11/2019 10:32 AM
1910186-007	Indoor	10/09/2019 6:12 PM	10/11/2019 10:32 AM

Case Narrative

WO#: **1910186**

Date: **10/22/2019**

CLIENT: Libby Environmental
Project: 4 Corners Cleaners

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Air samples are reported in ppbv and ug/m3.

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Standard temperature and pressure assumes 24.45 = (25C and 1 atm).

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Client: **Libby Environmental**
WorkOrder: 1910186
Project: 4 Corners Cleaners

Client Sample ID: VP-3
Lab ID: 1910186-001A
Sample Type: Summa Canister

Date Sampled: 10/9/2019
Date Received: 10/11/2019

Analyte	Concentration		Reporting Limit		Qual	Method	Date/Analyst	
Volatile Organic Compounds by EPA Method TO-15								
	(ppbv)	(ug/m³)	(ppbv)	(ug/m³)				
1,1-Dichloroethene (DCE)	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
cis-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Tetrachloroethene (PCE)	109	743	3.00	20.3		EPA-TO-15	10/22/2019	AD
trans-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Trichloroethene (TCE)	0.245	1.32	0.200	1.07		EPA-TO-15	10/21/2019	AD
Vinyl chloride	<0.200	<0.511	0.200	0.511		EPA-TO-15	10/21/2019	AD
Surr: 4-Bromofluorobenzene	110 %Rec	--	70-130	--		EPA-TO-15	10/21/2019	AD

Client: **Libby Environmental**
WorkOrder: 1910186
Project: 4 Corners Cleaners

Client Sample ID: VP-2
Lab ID: 1910186-002A
Sample Type: Summa Canister

Date Sampled: 10/9/2019
Date Received: 10/11/2019

Analyte	Concentration		Reporting Limit		Qual	Method	Date/Analyst	
Volatile Organic Compounds by EPA Method TO-15								
	(ppbv)	(ug/m³)	(ppbv)	(ug/m³)				
1,1-Dichloroethene (DCE)	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
cis-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Tetrachloroethene (PCE)	<0.300	<2.03	0.300	2.03		EPA-TO-15	10/21/2019	AD
trans-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Trichloroethene (TCE)	<0.200	<1.07	0.200	1.07		EPA-TO-15	10/21/2019	AD
Vinyl chloride	<0.200	<0.511	0.200	0.511		EPA-TO-15	10/21/2019	AD
Surr: 4-Bromofluorobenzene	97.2 %Rec	--	70-130	--		EPA-TO-15	10/21/2019	AD

Client: **Libby Environmental**
WorkOrder: 1910186
Project: 4 Corners Cleaners

Client Sample ID: Input
Lab ID: 1910186-003A
Sample Type: Summa Canister

Date Sampled: 10/9/2019
Date Received: 10/11/2019

Analyte	Concentration		Reporting Limit		Qual	Method	Date/Analyst	
Volatile Organic Compounds by EPA Method TO-15								
	(ppbv)	(ug/m³)	(ppbv)	(ug/m³)				
1,1-Dichloroethene (DCE)	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
cis-1,2-Dichloroethene	0.552	2.19	0.200	0.793		EPA-TO-15	10/21/2019	AD
Tetrachloroethene (PCE)	1.52	10.3	0.300	2.03		EPA-TO-15	10/21/2019	AD
trans-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Trichloroethene (TCE)	0.819	4.40	0.200	1.07		EPA-TO-15	10/21/2019	AD
Vinyl chloride	<0.200	<0.511	0.200	0.511		EPA-TO-15	10/21/2019	AD
Surr: 4-Bromofluorobenzene	92.1 %Rec	--	70-130	--		EPA-TO-15	10/21/2019	AD

Client: **Libby Environmental**
WorkOrder: 1910186
Project: 4 Corners Cleaners

Client Sample ID: VP-1
Lab ID: 1910186-004A
Sample Type: Summa Canister

Date Sampled: 10/9/2019
Date Received: 10/11/2019

Analyte	Concentration		Reporting Limit		Qual	Method	Date/Analyst	
	(ppbv)	(ug/m³)	(ppbv)	(ug/m³)				
Volatile Organic Compounds by EPA Method TO-15								
1,1-Dichloroethene (DCE)	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
cis-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Tetrachloroethene (PCE)	86.4	586	3.00	20.3		EPA-TO-15	10/22/2019	AD
trans-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Trichloroethene (TCE)	0.901	4.84	0.200	1.07		EPA-TO-15	10/21/2019	AD
Vinyl chloride	<0.200	<0.511	0.200	0.511		EPA-TO-15	10/21/2019	AD
Surr: 4-Bromofluorobenzene	102 %Rec	--	70-130	--		EPA-TO-15	10/21/2019	AD

Client: **Libby Environmental**
WorkOrder: 1910186
Project: 4 Corners Cleaners

Client Sample ID: Output
Lab ID: 1910186-005A
Sample Type: Summa Canister

Date Sampled: 10/9/2019
Date Received: 10/11/2019

Analyte	Concentration		Reporting Limit		Qual	Method	Date/Analyst	
Volatile Organic Compounds by EPA Method TO-15								
	(ppbv)	(ug/m³)	(ppbv)	(ug/m³)				
1,1-Dichloroethene (DCE)	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
cis-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Tetrachloroethene (PCE)	<0.300	<2.03	0.300	2.03		EPA-TO-15	10/21/2019	AD
trans-1,2-Dichloroethene	<0.200	<0.793	0.200	0.793		EPA-TO-15	10/21/2019	AD
Trichloroethene (TCE)	<0.200	<1.07	0.200	1.07		EPA-TO-15	10/21/2019	AD
Vinyl chloride	<0.200	<0.511	0.200	0.511		EPA-TO-15	10/21/2019	AD
Surr: 4-Bromofluorobenzene	103 %Rec	--	70-130	--		EPA-TO-15	10/21/2019	AD

Client: **Libby Environmental**
WorkOrder: 1910186
Project: 4 Corners Cleaners

Client Sample ID: Outdoor
Lab ID: 1910186-006A
Sample Type: Summa Canister

Date Sampled: 10/9/2019
Date Received: 10/11/2019

Analyte	Concentration		Reporting Limit		Qual	Method	Date/Analyst	
Volatile Organic Compounds by EPA Method TO-15								
	(ppbv)	(ug/m³)	(ppbv)	(ug/m³)				
1,1-Dichloroethene (DCE)	<0.100	<0.397	0.100	0.397		EPA-TO-15	10/21/2019	AD
cis-1,2-Dichloroethene	<0.100	<0.396	0.100	0.396		EPA-TO-15	10/21/2019	AD
Tetrachloroethene (PCE)	<0.150	<1.02	0.150	1.02		EPA-TO-15	10/21/2019	AD
trans-1,2-Dichloroethene	<0.100	<0.396	0.100	0.396		EPA-TO-15	10/21/2019	AD
Trichloroethene (TCE)	<0.100	<0.537	0.100	0.537		EPA-TO-15	10/21/2019	AD
Vinyl chloride	<0.100	<0.256	0.100	0.256		EPA-TO-15	10/21/2019	AD
Surr: 4-Bromofluorobenzene	91.1 %Rec	--	70-130	--		EPA-TO-15	10/21/2019	AD

Client: **Libby Environmental**
WorkOrder: 1910186
Project: 4 Corners Cleaners

Client Sample ID: Indoor
Lab ID: 1910186-007A
Sample Type: Summa Canister

Date Sampled: 10/9/2019
Date Received: 10/11/2019

Analyte	Concentration		Reporting Limit		Qual	Method	Date/Analyst	
Volatile Organic Compounds by EPA Method TO-15								
	(ppbv)	(ug/m³)	(ppbv)	(ug/m³)				
1,1-Dichloroethene (DCE)	<0.100	<0.397	0.100	0.397		EPA-TO-15	10/21/2019	AD
cis-1,2-Dichloroethene	<0.100	<0.396	0.100	0.396		EPA-TO-15	10/21/2019	AD
Tetrachloroethene (PCE)	<0.150	<1.02	0.150	1.02		EPA-TO-15	10/21/2019	AD
trans-1,2-Dichloroethene	<0.100	<0.396	0.100	0.396		EPA-TO-15	10/21/2019	AD
Trichloroethene (TCE)	<0.100	<0.537	0.100	0.537		EPA-TO-15	10/21/2019	AD
Vinyl chloride	<0.100	<0.256	0.100	0.256		EPA-TO-15	10/21/2019	AD
Surr: 4-Bromofluorobenzene	100 %Rec	--	70-130	--		EPA-TO-15	10/21/2019	AD

Work Order: 1910186
CLIENT: Libby Environmental
Project: 4 Corners Cleaners

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method TO-15

Sample ID **LCS-R54745** SampType: **LCS** Units: **ppbv** Prep Date: **10/21/2019** RunNo: **54745**
Client ID: **LCSW** Batch ID: **R54745** Analysis Date: **10/21/2019** SeqNo: **1085866**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	1.94	0.107	2.000	0	96.9	70	130				
1,1-Dichloroethene (DCE)	2.37	0.400	2.000	0	118	70	130				
trans-1,2-Dichloroethene	2.24	0.200	2.000	0	112	70	130				
cis-1,2-Dichloroethene	2.21	0.200	2.000	0	110	70	130				
Trichloroethene (TCE)	2.28	0.0649	2.000	0	114	70	130				
Tetrachloroethene (PCE)	2.10	0.200	2.000	0	105	70	130				
Surr: 4-Bromofluorobenzene	4.12		4.000		103	70	130				

Sample ID **MB-R54745** SampType: **MBLK** Units: **ppbv** Prep Date: **10/21/2019** RunNo: **54745**
Client ID: **MBLKW** Batch ID: **R54745** Analysis Date: **10/21/2019** SeqNo: **1085867**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0536									
1,1-Dichloroethene (DCE)	ND	0.200									
trans-1,2-Dichloroethene	ND	0.100									
cis-1,2-Dichloroethene	ND	0.100									
Trichloroethene (TCE)	ND	0.0324									
Tetrachloroethene (PCE)	ND	0.100									
Surr: 4-Bromofluorobenzene	1.68		2.000		84.0	70	130				

Sample ID **1910186-007AREP** SampType: **REP** Units: **ppbv** Prep Date: **10/21/2019** RunNo: **54745**
Client ID: **Indoor** Batch ID: **R54745** Analysis Date: **10/21/2019** SeqNo: **1085875**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Vinyl chloride	ND	0.0536						0		30	
1,1-Dichloroethene (DCE)	ND	0.200						0		30	
trans-1,2-Dichloroethene	ND	0.100						0		30	
cis-1,2-Dichloroethene	ND	0.100						0		30	
Trichloroethene (TCE)	ND	0.0324						0		30	
Tetrachloroethene (PCE)	0.111	0.100						0.09328	17.2	30	

Work Order: 1910186
CLIENT: Libby Environmental
Project: 4 Corners Cleaners

QC SUMMARY REPORT

Volatile Organic Compounds by EPA Method TO-15

Sample ID **1910186-007AREP** SampType: **REP** Units: **ppbv** Prep Date: **10/21/2019** RunNo: **54745**
Client ID: **Indoor** Batch ID: **R54745** Analysis Date: **10/21/2019** SeqNo: **1085875**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	2.00		2.000		99.8	70	130		0		

Sample Log-In Check List

Client Name:	**LIBBY**	Work Order Number:	**1910186**
Logged by:	**Clare Griggs**	Date Received:	**10/11/2019 10:32:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	Client		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
		Air Samples		
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☑
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☐	No ☐	NA ☑
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

19. Additional remarks:

Item Information

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

Air Chain of Custody Record & Laboratory Services Agreement

Fremont Analytical
3600 Fremont Ave N.
Seattle, WA 98103
Tel: 206-352-3790
Fax: 206-352-7178

Date: 10/10/19 Page: 1 of: 2

Project Name: 4 Corners Cleaners

Project No:

Location: Maple Valley, WA

Collected by: B. Dalba

Reports to (PM):

Email (PM): bdalba@aegwa.com

Laboratory Project No (Internal): 17-126

Special Remarks:

Air samples are disposed of one week after report is submitted to client unless otherwise requested. ☐ OK to Dispose ☐ Hold (fees may apply)

Client: ABC

Address:

City, State, Zip:

Telephone:

Fax:

	Sample Name	Canister / Flow Reg Serial #	Sample Date & Time	Sample Type (Matrix) *	Container Type **	Fill Time / Flow Rate	Internal: Initial Evacuation Pressure (mtorr)	Field Initial Sample Pressure (" Hg)	Field Final Sample Pressure (" Hg)	Analysis: VOCs TO15 SCAN	VOCs TO15 SCAN LL	VOCs TO15 SIM	Siloxanes TO15	Sulfur TO15	Sulfur Ext. TO15	APH TO15	Helium	Major Gases 3C	PCE/ Chlorinated	Comments	Internal: Final Pressure ("Hg)
1	VP-3	4685	10/9/19 1349	S	1L	10 min	10mtorr 9/14/2019	-29 10/9/19	-2 10/9/19										X	100 cc	
2	VP-2	4681	10/9/19 1345	S	1L	10 min	10mtorr 9/14/2019	-30 10/9/19	-2 10/9/19										X	100 cc	
3	Input	4694	10/9/19 1459	S	1L	10 min	10mtorr 9/14/2019	-30 10/9/19	-2 10/9/19										X	100 cc	
4	VP-1	4880	10/9/19 1340	S	1L	10 min	10mtorr 9/14/2019	-30 10/9/19	-3 10/9/19										X	100 cc	
5	output	4688	10/9/19 1405	S	1L	10 min	10mtorr 9/26/2019	-30 10/9/19	-2 10/9/19										X	100 cc	

* Matrix Codes: AA = Ambient Air IA = Indoor Air L = Landfill S = Subslab / Soil Gas

** Container Codes: BV = 1 Liter Bottle Vac 6L = 6L Canister 1L = 1L Canister CYL = High Pressure Cylinder F = Filter S = Sorbent Tube TB = Tedlar Bag

I represent that I am authorized to enter into this Agreement with Fremont Analytical on behalf of the Client named above, that I have verified Client's agreement to each of the terms on the front and backside of this Agreement.

Relinquished	Date/Time	Received	Date/Time
x [signature]	10/10/19 1325	x Melissa Tofte	10/10/19 1325
x		x	

Turn-Around Time:

- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

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Date: 10/10/19 Page: 2 of: 2

Project Name: 4 Corners Cleaners

Project No:

Location: Maple Valley, WA

Collected by: B. Dilbeck

Reports to (PM):

Email (PM): bdilbeck@aegwa.com

Laboratory Project No (Internal):

Special Remarks:

Air samples are disposed of one week after report is submitted to client unless otherwise requested. ☐ OK to Dispose ☐ Hold (fees may apply)

Client: AEG

Address:

City, State, Zip:

Telephone:

Fax:

	Sample Name	Canister / Flow Reg Serial #	Sample Date & Time	Sample Type (Matrix) *	Container Type **	Fill Time / Flow Rate	Internal: Initial Evacuation Pressure (mtorr)	Field Initial Sample Pressure (" Hg)	Field Final Sample Pressure (" Hg)	Analysis: VOCs TO15 SCAN	VOCs TO15 SCAN LL	VOCs TO15 SIM	Siloxanes TO15	Sulfur TO15	Sulfur Ext. TO15	APH TO15	Helium	Major Gases 3C	PCE; Duplicates	Comments	Internal: Final Pressure ("Hg)
1	Outdoor	12668	10/9/19	IA	6L	8 hr	10mtorr	-30	-10										Y	200cc	
		FR8-02	1810				10/7/2019	10/9/19	10/9/19												
2	Indoor	17647	10/9/19	IA	6L	8 hr	10mtorr	-30	-10										Y	200cc	
		FR8-11	1812				10/7/2019	10/9/19	10/9/19												
3																					
4																					
5																					

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x [signature]	10/10/19 1325	x [signature]	10/10/19 1325
Relinquished	Date/Time	Received	Date/Time
x		x	

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Date: 10/10/19 Page: 1 of: 2

Laboratory Project No (Internal): 1910186

Project Name: 4 Corners Cleaners

Special Remarks:

Project No: L191010-5

Client: LIBBY

Address: 3322 S Bay Rd NE

City, State, Zip: Olympia, WA 98506

Telephone: 360-352-2110

Fax:

Location:

Collected by: B.D.

Reports to (PM): Sherry Chilcutt

Email (PM): libbyenv@gmail.com

Air samples are disposed of one week after report is submitted to client unless otherwise requested. ☐ OK to Dispose ☐ Hold (fees may apply)

	Sample Name	Canister / Flow Reg Serial #	Sample Date & Time	Sample Type (Matrix) *	Container Type **	Fill Time / Flow Rate	Internal: Initial Evacuation Pressure (mtorr)	Field Initial Sample Pressure (" Hg)	Field Final Sample Pressure (" Hg)	Analysis: VOCs TO15 SCAN	VOCs TO15 SCAN LL	VOCs TO15 SIM	Siloxanes TO15	Sulfur TO15	Sulfur Ext. TO15	APH TO15	Helium	Major Gases 3C	2e' Dewars	Comments	Internal: Final Pressure ("Hg)
1	VP-3	4685	10/9/19 1349	S	1L	10 min	10mtorr 9/14/2019	-29 10/9/19	-2 10/9/19										X	100cc	-2
2	VP-2	4681	10/9/19 1345	S	1L	10 min	10mtorr 9/14/2019	-30 10/9/19	-2 10/9/19										X	100cc	-4
3	Input	4694	10/9/19 1458	S	1L	10 min	10mtorr 9/14/2019	-30 10/9/19	-2 10/9/19										X	100cc	-3
4	VP-1	4880	10/9/19 1340	S	1L	10 min	10mtorr 9/14/2019	-30 10/9/19	-3 10/9/19										X	100cc	-2
5	output	4688	10/9/19 1405	S	1L	10 min	10mtorr 9/26/2019	-30 10/9/19	-2 10/9/19										X	100cc	-2

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Relinquished	Date/Time	Received	Date/Time
x [signature]	10-10-19 1300	x UPS	
Relinquished	Date/Time	Received	Date/Time
x UPS		x [signature]	10/11/19 1032

Turn-Around Time:
- ☒ Standard
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- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)

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Date: 10/10/19 Page: 2 of: 2

Laboratory Project No (Internal): 191086

Project Name: L191010-5

Project No: 4 Corners Cleaners

Special Remarks:

Client: LIBBY

Address: 3322 S Bay Rd NE

City, State, Zip: Olympia, WA 98506

Telephone: 360-352-2110

Fax:

Location:

Collected by: B.D

Reports to (PM): Sherry Chilcutt

Email (PM): libbyenv@gmail.com

Air samples are disposed of one week after report is submitted to client unless otherwise requested. ☐ OK to Dispose ☐ Hold (fees may apply)

	Sample Name	Canister / Flow Reg Serial #	Sample Date & Time	Sample Type (Matrix) *	Container Type **	Fill Time / Flow Rate	Internal: Initial Evacuation Pressure (mtorr)	Field Initial Sample Pressure (" Hg)	Field Final Sample Pressure (" Hg)	Analysis: VOCs TO15 SCAN	VOCs TO15 SCAN LL	VOCs TO15 SIM	Siloxanes TO15	Sulfur TO15	Sulfur Ext. TO15	APH TO15	Helium	Major Gases 3C	Pb; Naphth	Comments	Internal: Final Pressure ("Hg)
1	Outdoor	12668 Canister / FR8-02 Flow Reg	10/9/19 Date / 1810 Time	IA	6L	8 hr	10mtorr Pressure / 10/7/2019 Date	-30 Pressure / 10/9/19 Date	-10 Pressure / 10/9/19 Date										X	200cc	-9
2	Indoor	17647 Canister / FR8-11 Flow Reg	10/9/19 Date / 1812 Time	IA	6L	8 hr	10mtorr Pressure / 10/7/2019 Date	-30 Pressure / 10/9/19 Date	-10 Pressure / 10/9/19 Date										X	200cc	-2
3		Canister / Flow Reg	Date / Time				Pressure / Date	Pressure / Date	Pressure / Date												
4		Canister / Flow Reg	Date / Time				Pressure / Date	Pressure / Date	Pressure / Date												
5		Canister / Flow Reg	Date / Time				Pressure / Date	Pressure / Date	Pressure / Date												

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Relinquished	Date/Time	Received	Date/Time
x [signature]	10/10/19 1500	x UPS	
Relinquished	Date/Time	Received	Date/Time
x UPS		x [signature]	10/11/19 1032

Turn-Around Time:

- ☒ Standard
- ☐ 3 Day
- ☐ 2 Day
- ☐ Next Day
- Same Day _____ (specify)