STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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November 13, 2019

Chang Kim
Four Corners Cleaners
23886 Kent-Kangley Road
Maple Valley, WA 98038

Re: Opinion Pursuant to WAC 173-340-515(5) on the *RI/FS and CAP Reports* for the Following Hazardous Waste Site:

- **Name: Four Corners Cleaners New Location**
- **Address:** 23886 SE Kent-Kangley Road, Maple Valley, WA 98038
- **Facility/Site No.:** 5867
- **Cleanup Site ID No.:** 12513
- **VCP No.:** NW3234

Dear Chang Kim,

The Washington State Department of Ecology (Ecology) received your request for an opinion on characterization work (*Four Corners Cleaners RI/FS and CAP*) completed at the **Four Corners Cleaners** facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Pursuant to completion of the *Remedial Investigation/Feasibility Study Report (RI/FS, dated 3/14/2019) and Cleanup Action Plan (CAP, dated 5/29/2019)*, is additional soil and soil vapor sampling and evaluation necessary once the proposed cleanup action has been completed?

YES. Ecology has determined that additional soil, soil gas, and ground water sampling and evaluation is necessary once the proposed cleanup action has been completed at the Property.

This opinion is based on an analysis of whether the described evaluation meets the substantive requirements of MTCA, Chapter 70.105D RCW, its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"), and Ecology's guidance documents associated with petroleum releases. The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Tetrachloroethylene (PCE), Trichloroethene (TCE), cis-1,2-Dichloroethene (DCE), trans-1,2-DCE and vinyl chloride into the Soil
- PCE, TCE, cis-1,2-DCE, trans-1,2-DCE and vinyl chloride into the Soil Gas
- Suspected PCE and associated breakdown products into the Ground Water

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

Ecology's Toxics Cleanup Program has reviewed the following information contained in the following documents regarding your proposed remedial actions:

1. Associated Environmental Group, LLC, *Four Corners Cleaners Cleanup Action Plan; Four Corners Cleaners; 23886 Kent-Kangley Road, Maple Valley, Washington* dated May 29, 2019.
2. Associated Environmental Group, LLC, *Four Corners Cleaners Remedial Investigation/Feasibility Study/Report; Four Corners Cleaners; 23886 Kent-Kangley Road, Maple Valley, Washington* dated March 14, 2019.
3. Washington Department of Ecology, *No Further Action Opinion, Four Corners Cleaners New Location; 23886 Kent-Kangley Road, Maple Valley, Washington, VCP No. NW2962,* dated February 28, 2017.

These documents are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. You can make an appointment by completing a Request for Public Record form (https://www.ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests) and emailing it to PublicRecordsOfficer@ecy.wa.gov, or contacting the Public Records Officer at 360-407-6040. A number of these documents are accessible in electronic form from the Site web page (https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=12513).

Analysis and Opinion

1. Additional soil, soil gas and ground water sampling and evaluation to determine an effective, final remedial action.

Based on a review of the *Four Corners Cleaners RI/FS and CAP,* 2018, and other Site documents listed, Ecology has determined **that additional soil, soil gas, and ground water sampling and evaluation is necessary** once the proposed cleanup action has been completed at the Property.

The *RI/FS and CAP:*

- Describes the Property
- Summarizes current property conditions;
- Summarizes the cleanup action alternatives considered in the remedy selection process;
- Describes the selected cleanup action for the Property and the rationale for selecting this alternative; and
- Identifies site-specific cleanup levels and points of compliance for each hazardous substance and medium of concern for the proposed cleanup action.

Note that additional sampling, analysis and evaluation of soil, soil gas, and ground water is necessary to determine an effective, final site-specific remedial action.

Sampling should commence after a period of stabilization following remediation. The data will determine if the proposed cleanup action is likely to result in soil and soil gas, and ground water cleanup standards being met in a reasonable timeframe.

2. Continued Evaluation of Vapor Intrusion Pathway.

Based on a review of the Site documents listed, Ecology has determined **further evaluation is necessary** to assess the vapor intrusion pathway potential to the buildings on the Property and commercial businesses in the vicinity of the Property.

Please refer to Ecology's Draft ***Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action,*** revised April 2018, for assessing and addressing soil vapor issues.

- In 2016, Ecology revised the vapor intrusion screening levels to reflect updated toxicological information. In addition, the sub-slab attenuation factor was reduced from 0.1 to 0.03 which raises sub-slab screening levels by a factor of approximately 3.

- An Excel spreadsheet with revised ground water, sub-slab soil gas, and deep soil gas screening levels is now available at:
  Table B-1: Link to revised (April 2015) Excel Spreadsheet for Vapor Intrusion Screening Levels

- On June 11, 2015, the U.S. Environmental Protection Agency (EPA) released two guidance documents related to vapor intrusion:

  - *Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (https://www.epa.gov/sites/production/files/2015-09/documents/oswer-vapor-intrusion-technical-guide-final.pdf)

  - *Technical Guide for Addressing Petroleum Vapor Intrusion at Leaking Underground Storage Tank Sites* (https://www.epa.gov/sites/production/files/2015-06/documents/pvi-guide-final-6-10-15.pdf)

- Also, the following are actions Ecology has taken to supplement portions of the Ecology Vapor Intrusion draft guidance. The major changes include:

  - The cleanup and screening levels in Table B-1 can also be found in Ecology's *Cleanup Levels and Risk Calculation (CLARC) VI* data tables. (https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Contamination-clean-up-tools/CLARC/Data-tables)

  - Ecology issued new guidance related to Petroleum Vapor Intrusion (PVI) evaluation: Implementation Memorandum No. 18, entitled: *Petroleum Vapor Intrusion (PVI) Updated Screening Levels, Cleanup Levels and Sampling Considerations, revised January 2018* (https://fortress.wa.gov/ecy/publications/SummaryPages/1709043.html). The memo proposes a generic Method B TPH indoor air cleanup level, addresses the requirement to account for the additive effects of the compounds present in petroleum mixtures and provides recommendations for assessing the potential threat of VI on future buildings.

  - Ecology issued Implementation Memorandum No. 21, entitled: *Frequently Asked Questions (FAQs) Regarding Vapor Intrusion (VI) and Ecology's 2009 Draft VI Guidance, revised November 2018* (https://fortress.wa.gov/ecy/publications/SummaryPages/1809046.html). This implementation memo answers a number of questions on whether specific portions of Ecology's Draft Vapor Intrusion (VI) Guidance are

still applicable. Most of these questions address technical or policy changes that have occurred since the draft guidance was issued.

- Ecology issued new guidance related to TCE evaluation: Implementation Memorandum No. 22 entitled: *Vapor Intrusion (VI) Investigations and Short-term Trichloroethene (TCE) Toxicity", revised September 2019.* https://fortress.wa.gov/ecy/publications/SummaryPages/1809047.html.

  TCE air cleanup levels were calculated based on the risk of health effects following chronic (many year) exposures. TCE, through a different mechanism of action, also presents health risks to developing fetuses following acute (≤3 week) exposures. A combination of expedited site characterization, public outreach, mitigation, and interim remedial action may be necessary to protect against these acute health risks.

  Specifically, this memorandum provides recommendations pertaining to cleanup sites contaminated with trichloroethene (TCE):

  - Provides indoor air action levels that are protective of short-term exposures to TCE.
  - Provides the default (non-site-specific) subsurface vapor intrusion (VI) screening levels that are protective of the short-term indoor air TCE action levels.
  - Identifies options for effectively and rapidly responding to those situations where TCE concentrations caused by VI in indoor air are above action levels.
  - Establishes the commitment by Ecology's Toxics Cleanup Program (TCP) to keep indoor air TCE concentrations (caused by VI) below short-term action levels at Model Toxics Cleanup Act (MTCA) cleanup sites in Washington State.
  - Provides guidance and recommendations for those scenarios where a) VI-caused TCE indoor air concentrations exceed, or may exceed, the short-term action levels, and b) the building being investigated is regularly occupied by female residents or workers of childbearing age.

- Note that the standard point of compliance for air is in the ambient air throughout the Site.

3. Characterization of Site Hydrogeologic Conditions

Monitoring wells constructed per WAC 173-160 are needed at the Site to assess the following:

- Ground water elevations, flow direction(s), and gradients.

- Locations for collection of representative ground water samples, upgradient and downgradient of Site contamination sources.

- Concentrations of chemicals of concern (COCs) in ground water. Note that a minimum of four quarters of ground water samples with results below MTCA Method A cleanup levels are necessary to support a Site No Further Action opinion. The period of ground water sample after conducting remediation will be extended to assess potential rebound of contaminant concentrations.

- Potential impacts to local ground water supplies. The Site is located within the 1-year time-of-travel wellhead protection zone of the Witte Well #2, operated by the Covington Water District.

4. Remedial action assessment.

The Site does not meet the MTCA definition of an industrial property; therefore soil cleanup levels suitable for unrestricted land use are appropriate. For unrestricted land use, direct contact, either MTCA Method A or Method B cleanup levels can be used. MTCA Method A soil cleanup levels, MTCA Method B sub-slab screening levels, and MTCA Method A ground water cleanup levels have been selected.

The MTCA Method A soil cleanup levels for unrestricted uses are appropriate (Table 740-1) to consider, with the standard point of compliance throughout the Site to a depth of 15 feet below the ground surface (reference WAC 173-340-740(6)(d)). The standard point of compliance for ground water applies to this Site, which is throughout the Site, from the uppermost level of the saturated zone extending vertically to the lowest depth which could potentially be affected by the Site.

A Terrestrial Ecological Evaluation (TEE) has been performed at this Site. The TEE is necessary to meet substantive requirements of MTCA, and to set cleanup levels that are protective of terrestrial species, and to determine an appropriate cleanup action. Soil cleanup levels protective of terrestrial ecological receptors are not necessary because the Site meets the initial Terrestrial Ecological Evaluation (TEE) exclusion criteria (WAC 173-340-7491(1)(c)(i)). There are less than 1.5 acres of contiguous undeveloped land on or within 500 feet of the area of the Site.

The selected action must meet applicable minimum requirements for cleanup actions stipulated in WAC 173-340-360: protect human health and the environment, comply with cleanup standards, use permanent solutions, and provide for reasonable restoration time frames.

Once cleanup has been completed, the project will need completion of a final Cleanup Action Report (CAR), which summarizes all work conducted at the Site as well as results, interpretations, and conclusions. Once the CAR has been reviewed and concurred by Ecology, a final opinion can then be issued concerning the Site.

5. Other requirements.

Electronic submittal of all sampling data into Ecology's electronic *Environmental Information Management* (EIM) database is a requirement in order to receive a final Ecology opinion for this Site. Data from this Site had not yet been entered into the EIM database when the Site was accepted into the VCP. Note that all data must be uploaded into the Ecology EIM system upon submission of each report to Ecology. This allows the Ecology Site Manager to access data to check results or perform additional analyses with those data. Suzan Pool (email spoo461@ecy.wa.gov, or via telephone at 360-407-7287) is Ecology's contact and resource on entering data into EIM.

Please note that Washington State regulations (Chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Wells), requires property owners to properly locate and decommission ground water monitoring wells which are no longer in use. Additional information on satisfying this requirement can be found at the following link: http://www.ecy.wa.gov/programs/wr/wells/abandon-wells.html. Noel Philip (email noel.philip@ecy.wa.gov, or via telephone at 425-649-7044), is the Ecology NWRO contact and resource for questions regarding locating and decommissioning Site wells. Wells could include monitoring wells, observation wells, piezometers, spill response wells, remediation wells, environmental investigation wells, vapor extraction wells, ground source heat pump boring, grounding wells, and instrumentation wells.

Before further work is completed, Ecology encourages the development of a work plan to ensure that sufficient data is collected to avoid unnecessary expenditure of time and money.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). Ecology appreciates your initiative in conducting independent remedial action and requesting technical consultation under the VCP. As the cleanup of the Site progresses, you may request additional consultative services under the VCP, including assistance in identifying applicable regulatory requirements and opinions regarding whether remedial actions proposed for or conducted at the Site meet those requirements.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions regarding this opinion, please feel free to contact me at (425) 649-4422, or email me at gcar461@ecy.wa.gov.

Sincerely,

Glynis A. Carrosino
Project Manager
Toxics Cleanup Program, NWRO

Enclosures (1): A – Description and Diagrams of the Site

cc: Becky Dilba, Associated Environmental Group LLC
Sonia Fernandez, VCP Coordinator, Ecology

Enclosure A

Description and Diagrams of the Site

Site Description

This section provides Ecology's understanding and interpretation of Site conditions, and is the basis for the opinions expressed in the body of the letter.

Site: The Site is defined by PCE, TCE, cis-1,2-DCE, trans-1,2-DCE and vinyl chloride into the soil and the soil gas. The Site is located northwest of the intersection between SE Kent-Kangley Road and Highway 169 in Maple Valley. The Property consists of King County tax parcel 510711-0010, which covers approximately 9.57 acres at 23886 Kent-Kangley Road in Maple Valley, Washington (Property). **(Figure 1)**

Area and Property Description: The Property is located in the middle of a city block, in an area of five retail buildings totaling 254,663 square feet. An "L" shaped building on the southwest portion of the Property includes the Four Corners Cleaners tenant space. The remainder of the Property not covered by buildings consists of asphalt-paved parking and driveways, and landscaped areas. The immediate vicinity of the Site is primarily commercial businesses. **(Figure 2)**

Site History and Current Use: The Property consists of a "L" shaped commercial building. Information has not been provided regarding when the building was built, nor how long the current dry cleaning facility has been operating. The Four Corners Cleaners facility continues to operate, and switched processes to a hydrocarbon dry cleaning machine in 2017.

Sources of Contamination: The potential sources of contamination at the Site are PCE and the related degradation products TCE, cis-1,2-DCE, trans-1,2-DCE and vinyl chloride associated with releases of chlorinated compounds from operations of the former dry cleaning machine at the facility. Site assessments conducted from 2003 to 2014 confirmed the presence of PCE and related degradation products in the soil vapor.

Physiographic Setting: The Property is located within the Puget Lowland physiographic province, a broad, low-lying region situated between the Cascade Range to the east and the Olympic Mountains to the west. The Site is located on the Des Moines drift upland, at an elevation of approximately 565 feet above mean sea level (msl). The Property surface is relatively level, with a slight gradient toward the north.

Surface Water: The closest bodies of water to the Property is Rock Creek, which is located approximately 2,000 feet to the east of the Property. Surface water and storm water runoff on and in the vicinity of the Site disperses via sheet flow to the City of Maple Valley's storm water drainage system.

Water Supply: A public water supply system is currently provided to the Site by the Covington Water District which obtains water from the City of Tacoma Green River watershed and multiple wells in the Lake Sawyer area. The Site is located within the 1-year time-of-travel wellhead protection zone of the District Witte Well #2.
According to Ecology's well log data base, there are no private drinking water wells located within approximately 1,000 feet of the Property.

Ecological Setting: The Property is located in a developed area and is surrounded by roadways and commercial and residential properties. Land surfaces are primarily covered by buildings and concrete or asphalt pavement.

Geology: The Site and vicinity are primarily underlain by the Vashon till, a dense unconsolidated glacial deposit characterized by poorly-sorted materials including gravel, sand, silt and clay. A thin veneer of Vashon recessional outwash deposits is also present, as recorded in Site well logs to depths of at least 20 feet below the ground surface (bgs), overlaying the till. Soils encountered at the Site consisted of silt with gravel to approximately 5 feet bgs, underlain by dense, sandy gravel with fine to course-sized gravels, and cobbles to about 35 feet bgs.

Ground water: Ground water depth at the Site ranged from approximately 25 to 33 feet bgs. Adjacent property (located east of the Site) ground water elevations indicate that the ground water flow direction is generally to the north. Ground water elevations, flow directions, and gradients have not been determined for this Site.

Release and Extent of Soil, Soil gas, and Ground water Contamination: The source of releases of contamination to the soil, soil gas and ground water at the Site are the use chlorinated solvents associated with the operations of the Four Corners Dry Cleaners facility prior to process change to hydrocarbon cleaning. **(Figure 3)**

Site characterization results are summarized as follows:

- In 2018, soil and ground water samples were collected from 10 boring locations (B-4 through B-13) to a maximum depth of 35 feet below the ground surface (bgs). Soil sample B11-18 was the only soil sample with a PCE detection above MTCA Method A cleanup levels. Ground water was encountered in six of the ten borings and no contaminants were detected in the single set of samples collected.

- Also in 2018, a Soil Vapor Extraction (SVE) pilot test was conducted. Eight temporary wells (T-1 through T-8) were installed at the Site. The SVE pilot test was conducted over a single day.

- The ground water flow direction on the Site has not been determined.

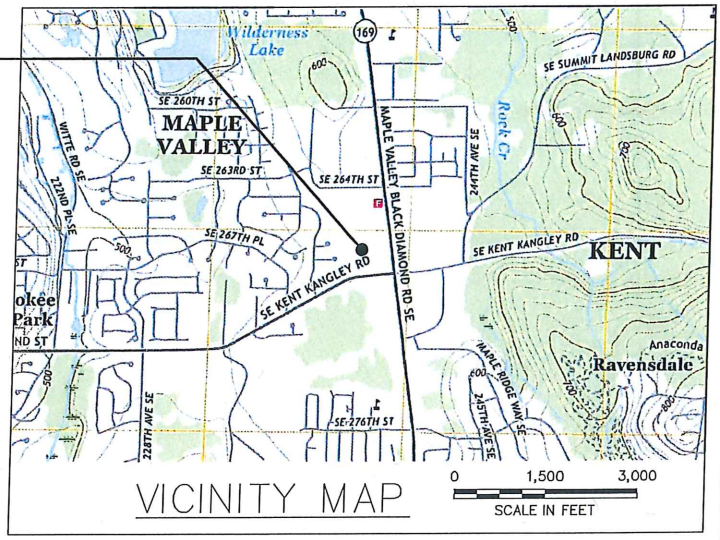
- Analytical results of sub-slab vapor samples identified the presence of PCE at concentrations above the MTCA Method B sub-slab screening level of 321 ug/m3 in all of the collected vapor samples, except sample SV-13. Concentrations of PCE ranged from 850 $\mu g/m^3$ in vapor sample SV-6, to 6,300 $\mu g/m^3$ in vapor sample SV-11. The highest concentrations were in the vicinity of the current and former dry cleaning machine.

Site Diagrams

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

N
W E
S

PROJECT LOCATION



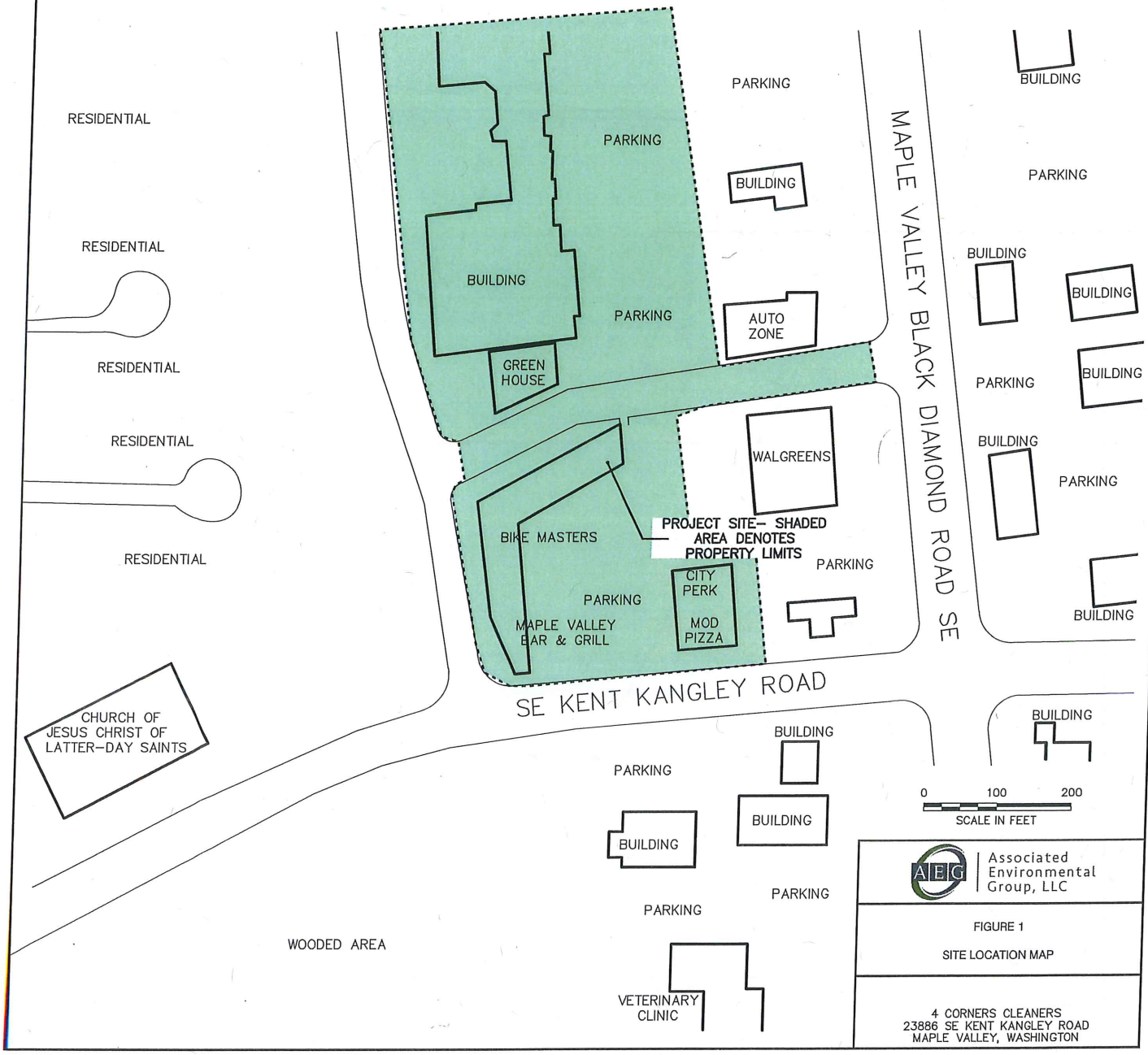
VICINITY MAP

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

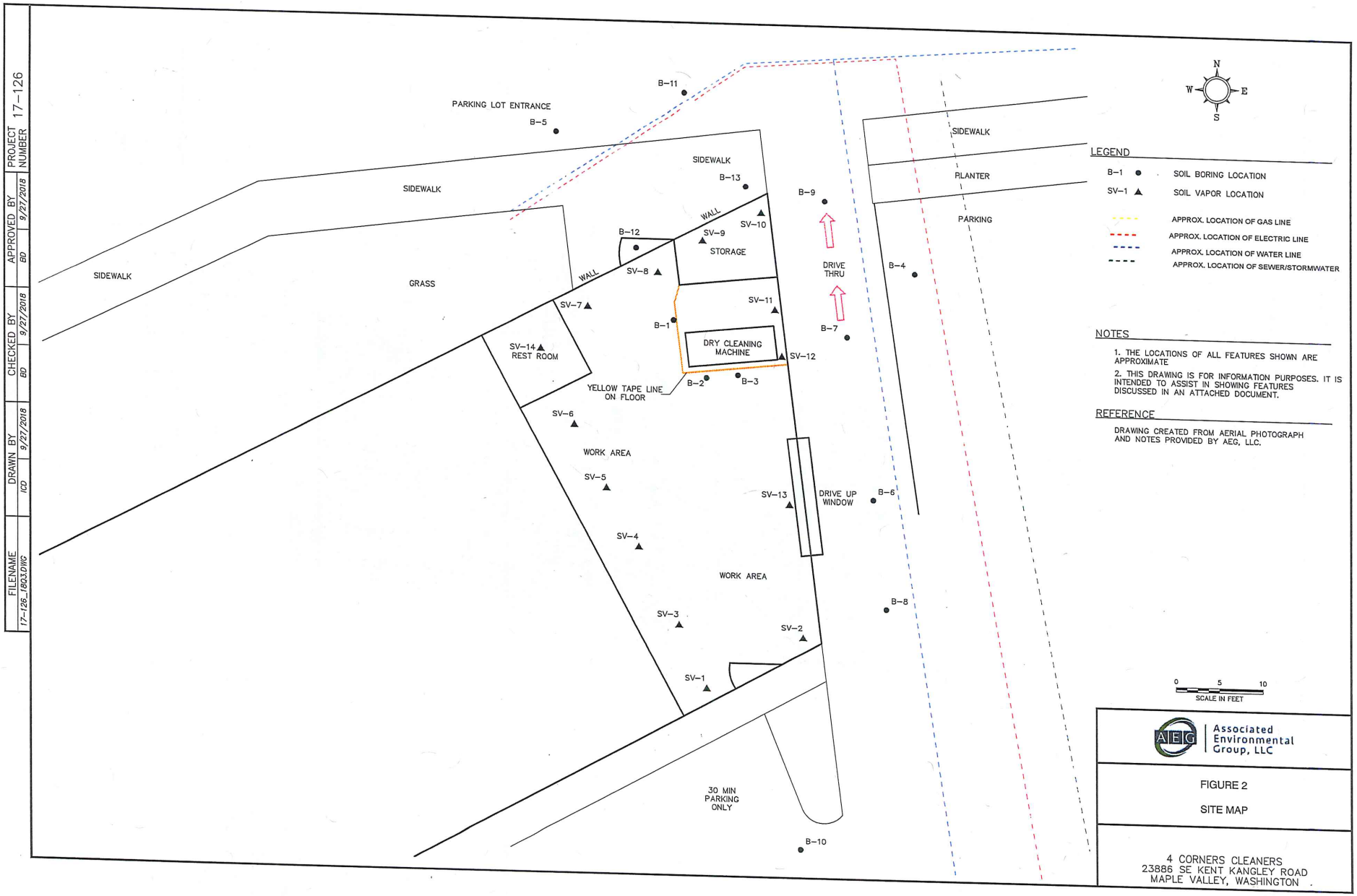


AEG Associated Environmental Group, LLC

FIGURE 1

SITE LOCATION MAP

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



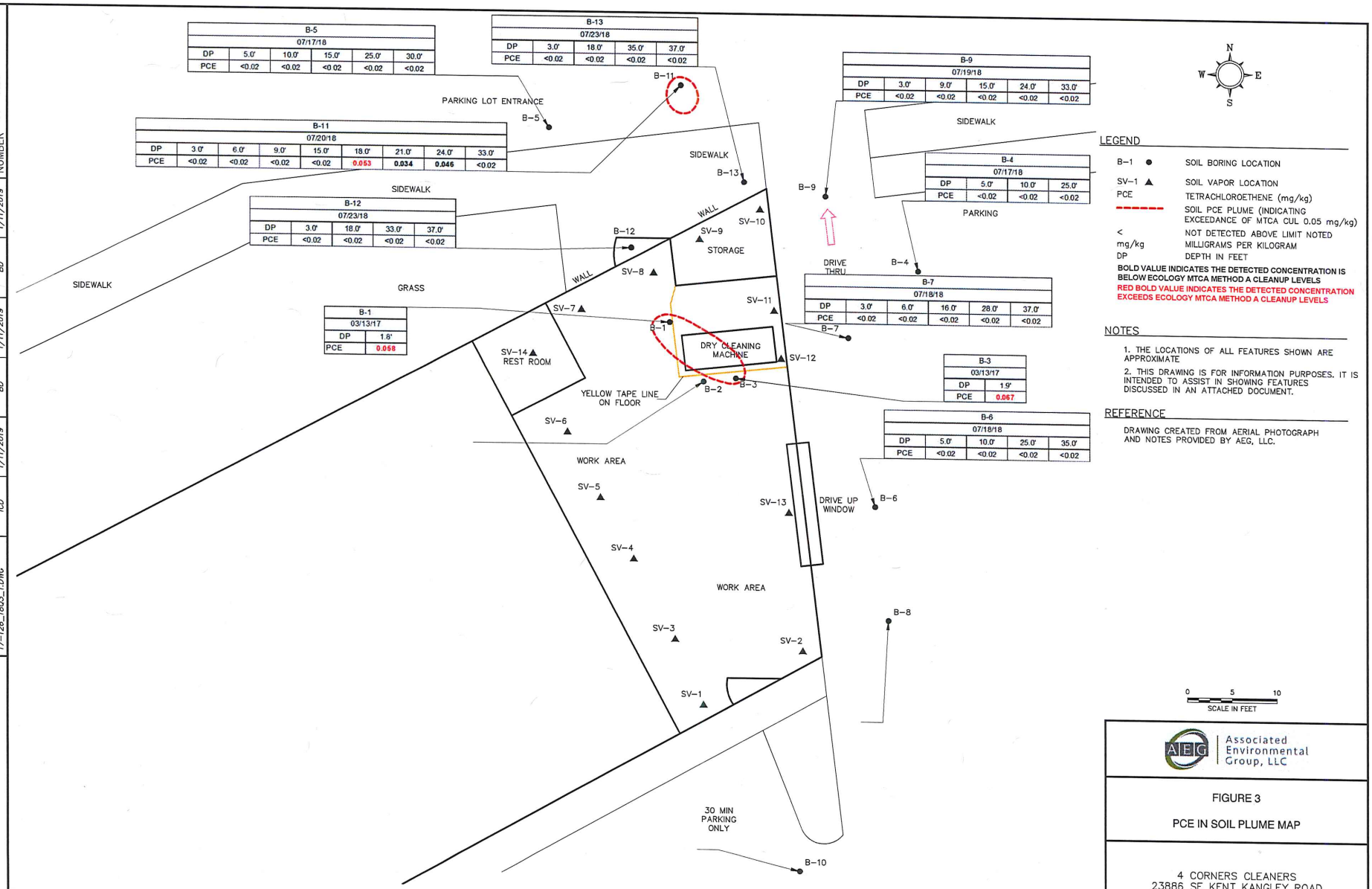
FILENAME	DRAWN BY		CHECKED BY		APPROVED BY		PROJECT NUMBER
17-126_1803.DWG	ICD	9/27/2018	BD	9/27/2018	BD	9/27/2018	17-126

Associated Environmental Group, LLC

FIGURE 2

SITE MAP

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



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

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.

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

Associated Environmental Group, LLC

FIGURE 3

PCE IN SOIL PLUME MAP

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