Electronic Copy

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
Northwest Regional Office • 3190 160th Avenue SE • Bellevue, Washington 98008-5452 • (425) 649-7000
711 for Washington Relay Service • Persons with a speech disability can call (877) 833-6341

November 19, 2020

Norah Potter
Lake Union Partners - Rainier & Genesee LLC
401 N 36th Street, Suite 104
Seattle, WA 98103
(norah@lakeunionpartners.com)

Re: Further Action at the following Site:

- **Site Name:** Rainier Mall
- **Site Address:** 4208 Rainier Avenue South, Seattle, WA 98118
- **Facility/Site No.:** 88987973
- **Cleanup Site ID:** 4187
- **VCP Project No.:** NW3261

Dear Norah Potter:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Rainier Mall 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

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). 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) and related degradation products that are chlorinated volatile organic chemicals (cVOCs) into the Soil, Groundwater, and Soil Vapor.

- Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) into the Soil and Groundwater.
- Oil-range petroleum hydrocarbons (TPH-O) into the soil.

Enclosure A includes a detailed description and diagrams 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

This opinion is based on the information contained in the following documents:

1. Hahn and Associates, Inc. 2000. Phase I Environmental Site Assessment: Rainier Mall. May 23.

2. Hahn and Associates, Inc. 2000. Phase II Environmental Site Assessment: Rainier Mall. August 1.

3. SoundEarth Strategies, Inc. 2017. Subsurface Investigation Summary Letter: Rainier Mall Property. March 31.

4. SoundEarth Strategies, Inc. 2018. Draft Subsurface Investigation Summary Report: Rainier Mall North Property. March 20.

5. SoundEarth Strategies, Inc. 2018. Draft Subsurface Investigation Summary Report: Rainier Mall South Property. March 22.

6. SoundEarth Strategies, Inc. 2018. Draft Supplemental Subsurface Investigation Summary Letter: Rainier Mall Property. October 29.

7. Department of Ecology. 2019. Rainier Mall - Site Hazard Assessment. July 15.

8. Urban Environmental Partners LLC. 2020. Remedial Investigation Work Plan, Rainier Mall Property, 4208 Rainier Avenue South, Seattle WA 98118, King County Parcel #7950301480, February 21, 2020.

9. Department of Ecology. 2020. Opinion on Proposed Remedial Action, Rainier Mall, VCP No. NW3261, May 28, 2020.

10. Urban Environmental Partners LLC. 2020. Remedial Investigation / Feasibility Study and Cleanup Action Plan (*RI/FS and CAP*), Rainier Mall Property, 4208 Rainier Avenue South, Seattle WA 98118, King County Parcel #7950301480, July 27, 2020.

A number of these documents are accessible in electronic form from the Site web page[1]. The complete records are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Visit our Public Records Request page[2] to submit a public records request or get more information about the process. If you require assistance with this process, you may contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or 360-407-6040.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

- The completion of four quarterly groundwater monitoring events are required to show that cPAH concentrations in soil are protective of groundwater.

Ecology requests additional clarification of site characterization details per our comments listed in **Enclosure B**. It is Ecology's opinion that with the inclusion of the edits listed in Enclosure B in a revised *RI/FS and CAP*, it is expected that the lateral and vertical extents of contamination, and potential exposure pathways, will be defined per the MTCA regulation.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA.

Cleanup levels: The MTCA Method A cleanup levels for TPH-O, and PCE and related degradation products that are cVOCs, are the applicable soil and groundwater cleanup levels for this Site. For cPAHs at the Site, the MTCA Method A cleanup levels are applicable for groundwater and direct contact with soil. The use of an empirical demonstration as described in WAC 173-340-747(9) is an appropriate method of showing cPAH soil concentrations are protective of groundwater.

[1] https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=4187
[2] https://ecology.wa.gov/publicrecords

Soil cleanup levels protective of terrestrial ecological receptors are likely not necessary because the planned Site development conditions appear to meet Terrestrial Ecological Evaluation (TEE) exclusion criteria (WAC 173-340-7491(1)(b)). All soil contaminated with hazardous substances is, or will be, covered by buildings, paved roads, pavement, or other physical barriers that will prevent plants or wildlife from being exposed to the soil contamination. To qualify for this exclusion, an institutional control shall be required. The *RI/FS and CAP* did not include the completed Ecology form documenting the TEE exclusion. Please include the appropriate form in the updated *RI/FS and CAP*.

The MTCA Method B sub-slab screening levels for PCE and related degradation products that are cVOCs, are the applicable concentrations to screen sewer lines at the site for protection of indoor air. The attenuation factor used for sub-slab and sewer line vapor migration to indoor air are both 0.03, as detailed in *Sewers and Utility Tunnels as Preferential Pathways for Volatile Organic Compound Migration into Buildings: Risk Factors and Investigation Protocol* (https://www.serdp-estcp.org/Program-Areas/Environmental-Restoration/Contaminated-Groundwater/Emerging-Issues/ER-201505).

Points of Compliance: The standard point of compliance for TPH-O, and PCE and related degradation products that are cVOCs, are applicable for soil and groundwater. The soil point of compliance is Site-wide throughout the soil profile and may extend below the water table. The groundwater point of compliance is Site-wide from the uppermost level of the saturated zone extending vertically to the lowest depth that could potentially be affected.

A conditional point of compliance for cPAH contamination related to the treated wood piles under the existing building is not supported by the current feasibility study. The feasibility of removing the wood piles and associated cPAH contaminated soil down to 15 feet below grade needs to be evaluated. If a conditional point of compliance for cPAH contamination is used, an environmental covenant would be required to manage the contamination left in place above 15 feet below grade (WAC 173-340-440(4)(e)). The point of compliance for cPAH in soil is based on protection for direct contact with soil. Ecology understands that an empirical demonstration is in process to show cPAH soil concentrations are protective of groundwater.

The sewer vapor screening location is the previously sampled sanitary sewer manhole west of the property.

3. Selection of cleanup action.

Ecology has determined that the incomplete Feasibility Study does not allow assessment as to whether the cleanup action you selected for the Site meets the substantive requirements of MTCA.

- The Feasibility Study must include a remedy of source removal by excavation and in-situ chemical treatment by reduction (ISCR) to treat groundwater outside the source area, as a baseline (WAC 173-340-360(3)(e)(ii)(B).

- The Feasibility Study must include remedial options for cPAH contamination under the existing building, including the most protective remedy of excavation to 15 feet below grade.

- The cost of shallow cPAH and VOC excavation and removal must be included in the Feasibility Study. The costs will vary based on the other items in the remedy.

- The costs and figure associated with the dual-phase extraction (DPE) remedy need to be adjusted to match the text. Both the cost table and the figure account for DPE wells in the S Genesee Street right-of-way.

- To show the robustness of the disproportionate cost analysis (DCA), another iteration should be completed, adjusting the Permanence, Protectiveness, and Long Term Effectiveness scores as detailed in **Enclosure B**.

Additional detail of the above comments and requested clarifications on the Feasibility Study are included in **Enclosure B**.

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). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/vcp. If you have any questions about this opinion, please contact me by phone at 425-691-0571 or e-mail at Tanner.Bushnell@ecy.wa.gov.

Sincerely,

TANNER BUSHNELL

Tanner Bushnell, Site Manager
NWRO Toxics Cleanup Program

Enclosures (2): A – Description and Diagrams of the Site
B – Detailed Ecology Comments on the *RI/FS and CAP*

cc: Kimberly Kuhl, Kane Properties LLC (kkuhl7@comcast.net)
John Funderburk, Urban Environmental Partners LLC (johnf@uepconsulting.com)
Brian Dixon, Dixon Environmental Services (brian@dixones.com)
Sonia Fernandez, VCP Coordinator – Ecology, (sonia.fernandez@ecy.wa.gov)

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 as PCE and related degradation products, cPAH contamination from subsurface timber piles impacting soil and groundwater, and TPH-O impacting soil. Soil gas samples suggest chlorinated and petroleum VOCs vapors are present in the soil below MTCA screening levels. The Site is located on King County tax parcel 7950301480 at the intersection of Rainier Avenue S and S Genesee Street in Seattle, Washington (the Property; see **Figure 1**).

Area and Property Description: The Property containing the contamination source area is located within mixed commercial, retail, and residential properties, including a school. The Property is located east of Rainier Avenue, and north of Genesee Street in Seattle, Washington**.** Based on currently available information, the Property containing the source of Site contamination includes 2.3 acres zoned for neighborhood commercial use (NC2-40), and is currently occupied by a vacant commercial building and parking lot. The Mount Baker Housing Authority is targeting the Site for a potential redevelopment into multi-family affordable housing.

Property History: The Property was reportedly developed with retail and residences beginning in 1929. From 1955 to 1978, up to three of the retail spaces in the southwest corner of the Property were occupied by drycleaners. In 1968 a grocery store was built in the northern portion of the property, with the structure supported by treated timber piles. The currently vacant former grocery store is the only remaining building on the Property.

Sources of Contamination: The sources of contamination include PCE from the three drycleaners formerly located in the southwest part of parcel 7950301480 and cPAH contamination from timber piles supporting the existing building. The source of oil range petroleum hydrocarbons in soil is unknown.

Physiographic Setting: The Site is situated at an elevation of approximately 45 feet above mean sea level, located within a topographic depression known as Rainier Valley. The land surface of the Site slopes generally to the southeast.

The Rainier Valley is associated with a former tributary stream valley of Lake Washington that was filled in the early 1900s with materials from unknown sources, to create flat land for development. The former stream channel flowed south parallel to Rainier Avenue, then east and northeast towards discharge into Lake Washington. The path of the former stream is evident from the locations of the present day Rainier Playfield and Genesee Park and Playfield (see **Figure 1**).

Surface/Storm Water System: Lake Washington is located approximately 2,700 feet northeast of the Site (see **Figure 1**). Stormwater catch basins within the Site flow to the municipal storm drainage system.

Ecological Setting: The Property located in a densely developed urban area, is paved with asphalt and gravel cover, and is surrounded by roadways and residential and commercial properties.

Geology: Soils at the Site are mapped as fill over Vashon till. Soils described from boring logs at the Site include approximately 10 to 15 feet of fill material, followed by silt and clay with silty sand layers, and dense silt, to the total depth explored of 90 feet bgs.

Groundwater: Static groundwater levels have been measured in monitoring wells at the Site between approximately 7 and 16 feet below ground surface (bgs). Monitoring well groundwater elevation data suggests groundwater flow approximately follows the filled stream to the southeast (**Figure 2**).

Release and Extent of Contamination in Soil and Groundwater:

Soil: Soil samples indicate that soil containing cVOC concentrations greater than MTCA Method A cleanup levels remains in the southwest portion of the Property. Deep cVOC soil impacts have been measured at approximately 35 feet bgs in the south central portion of the property and extending into the S Genesee Street right-of-way. TPH-O was detected in near-surface soils, greater than MTCA Method A cleanup levels (CULs). Soil within 3 inches of the treated wood piles beneath the vacant building on the Property are impacted by cPAHs at concentrations greater than CULs.

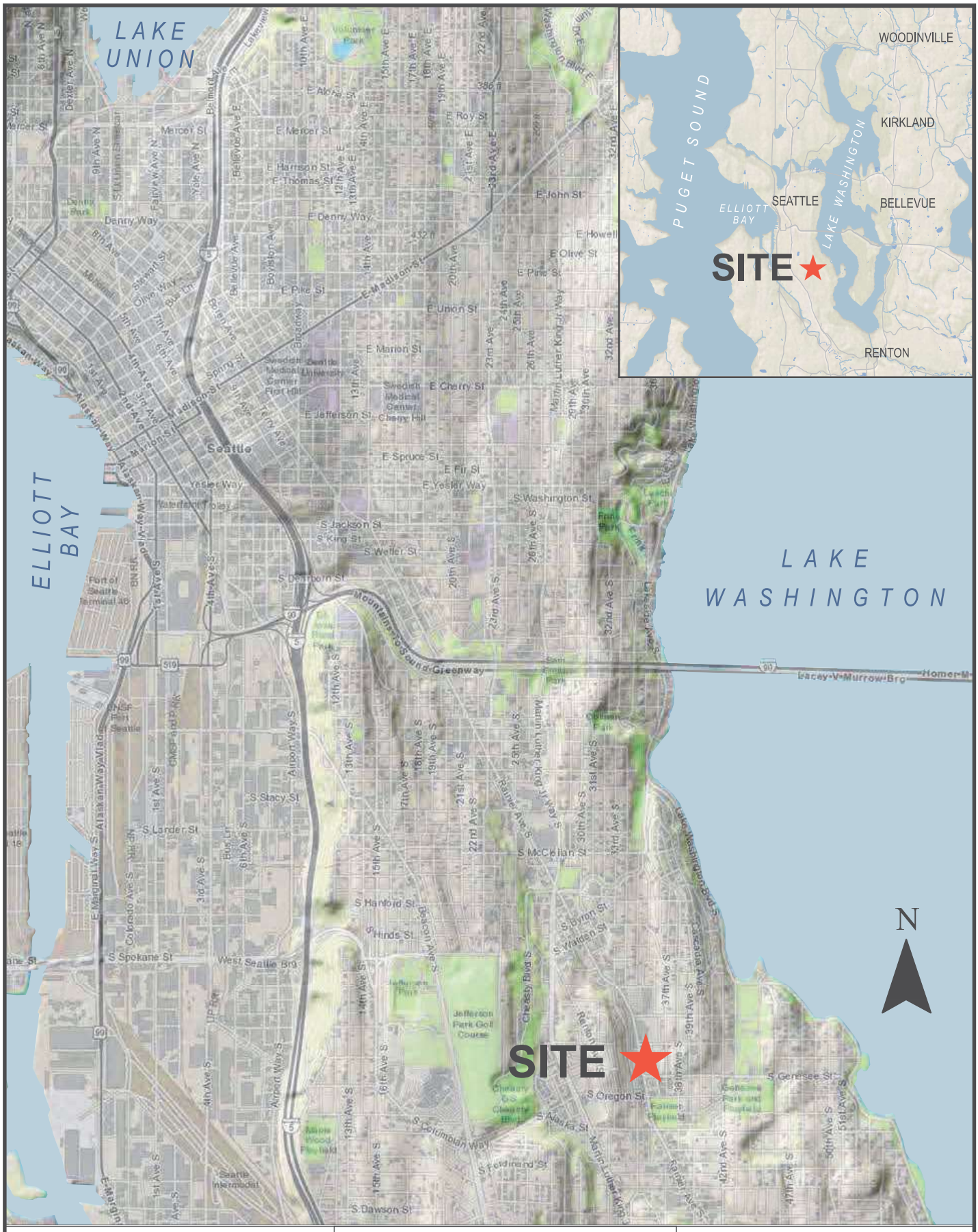
Sampling locations are shown on **Figure 3**. Chlorinated VOC concentrations exceeding CULs in soil samples collected from borings at the Site are shown on **Figures 4, 6 and 7**.

Groundwater: Groundwater samples obtained from monitoring wells installed at the former location of the drycleaners and extending south to the S Genesee Street right-of-way contain PCE and/or breakdown products. Groundwater PCE concentrations as high as 38,900 µg/L measured from wells on the Property suggest the potential for PCE as separate-phase product to be present.

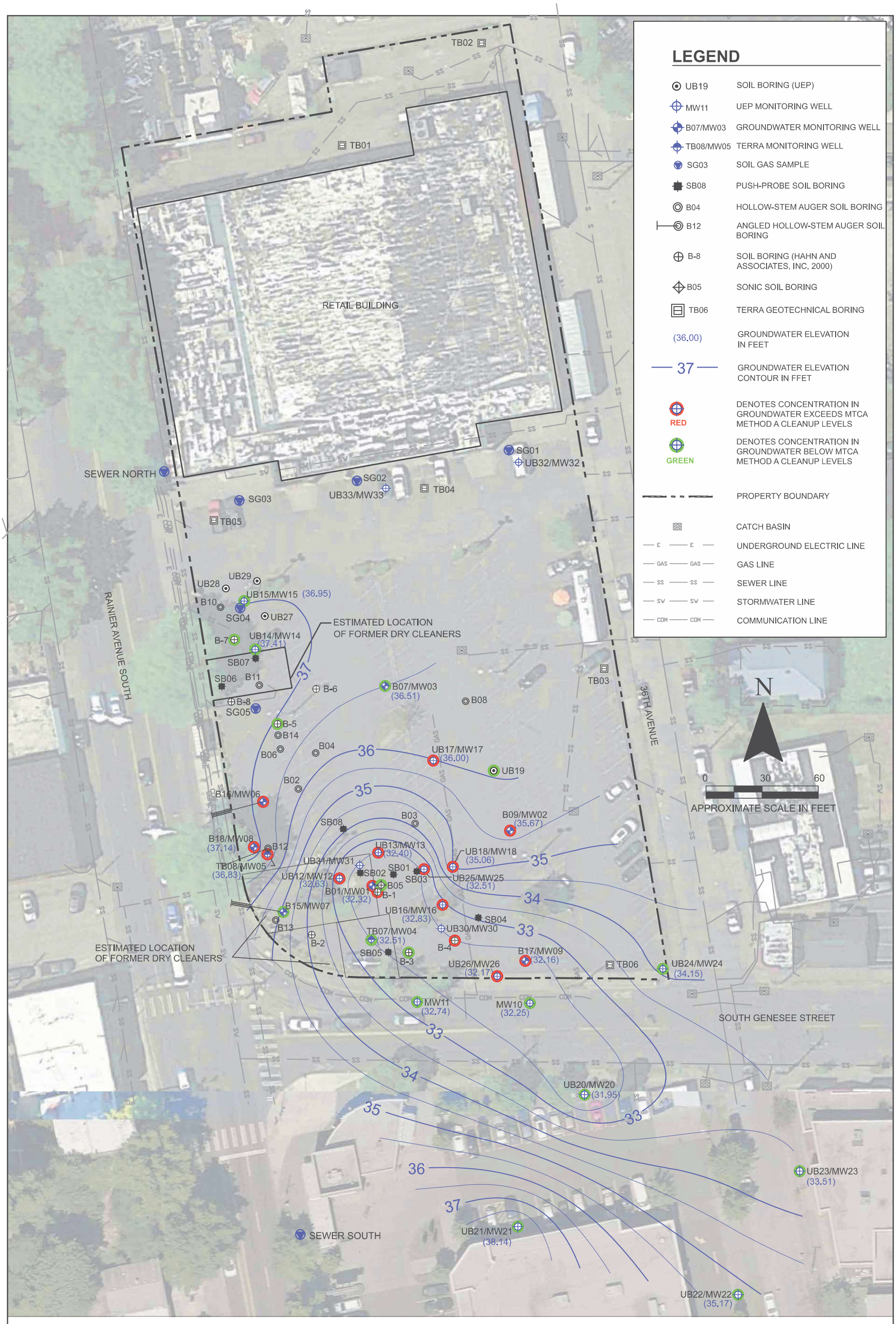
Chlorinated VOC concentrations exceeding CULs in groundwater samples collected from monitoring wells at the Site are shown on **Figure 5**.

Initial groundwater sampling suggests impacts to groundwater from cPAHs due to the treated wood piles may not extend beyond the building footprint. Groundwater in the area of TPH-O soil impacts does not contain petroleum hydrocarbons above CULs.

Site Diagrams

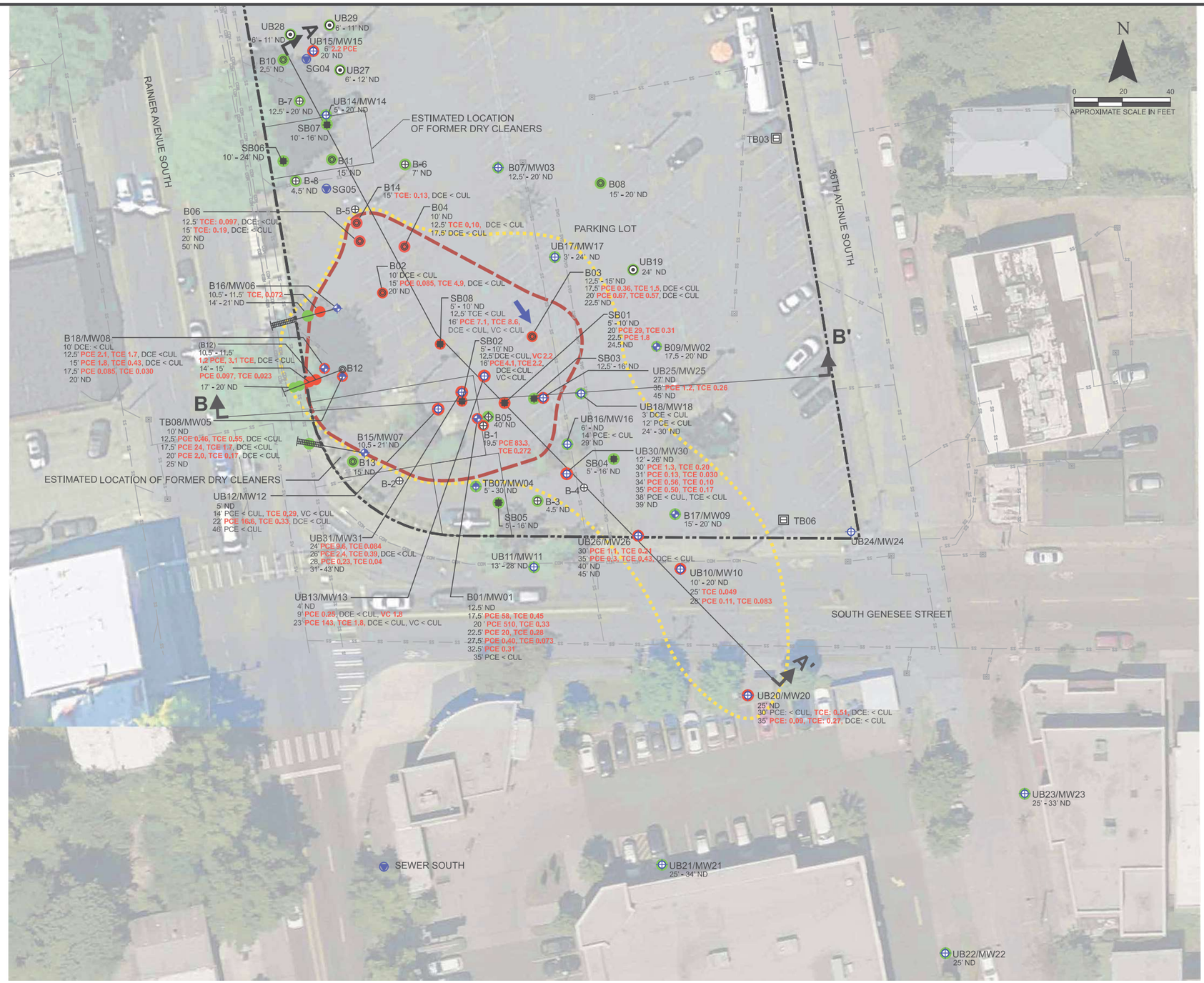


Urban Environmental Partners llc Diligent, responsive, and practical consulting!	Rainier Mall Site 4208 Rainier Avenue South Seattle, WA	Figure 1 Site Location Map



Urban Environmental Partners llc Diligent, responsive, and practical consulting!	Rainier Mall Site 4208 Rainier Avenue South Seattle, WA	Figure 11 Groundwater Contour Map 4/14/2020

Urban Environmental Partners llc Diligent, responsive, and practical consulting!	Rainier Mall Site 4208 Rainier Avenue South Seattle, WA	Figure 3 Exploration Location Plan



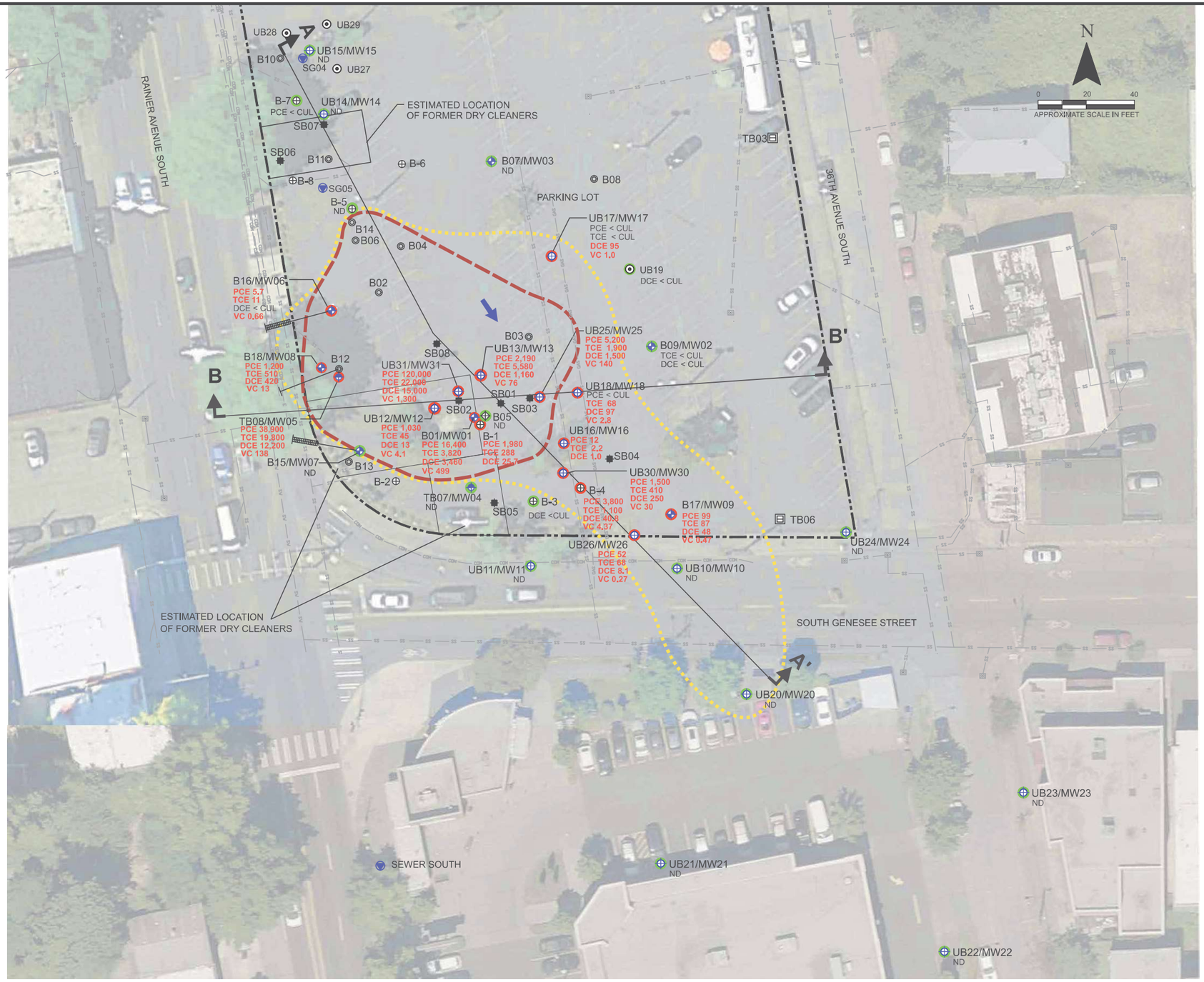
LEGEND

- PRIMARY SOURCE AREA
- EXTENT OF CVOC GROUNDWATER IMPACTS ABOVE CULs
- UB19 — SOIL BORING (UEP)
- MW10 — MONITORING WELL (UEP)
- B17/MW09 — GROUNDWATER MONITORING WELL (SES)
- TB08/MW05 — TERRA MONITORING WELL
- B12 — ANGLED HOLLOW-STEM AUGER GROUNDWATER MONITORING WELL
- SB08 — PUSH-PROBE SOIL BORING
- B04 — HOLLOW-STEM AUGER SOIL BORING
- B12 — ANGLED HOLLOW-STEM AUGER SOIL BORING
- B-8 — SOIL BORING (HAHN AND ASSOCIATES, INC, 2000)
- B05 — SONIC SOIL BORING
- T6 — TERRA GEOTECHNICAL BORING
- SG05 — SOIL GAS SAMPLE
- INFERRED GROUNDWATER FLOW DIRECTION
- CATCH BASIN
- PROPERTY BOUNDARY
- RED — DENOTES CONCENTRATION IN SOIL EXCEEDS MTCA METHOD A CLEANUP LEVELS
- GREEN — DENOTES CONCENTRATION IN SOIL BELOW MTCA METHOD A CLEANUP LEVELS
- 0.05 mg/kg — SOIL CLEANUP LEVEL FOR PCE
- A A' — CROSS SECTION LOCATION

Urban Environmental Partners llc
Diligent, responsive, and practical consulting!

Rainier Mall Site
4208 Rainier Avenue South
Seattle, WA

Figure 4
CVOC Concentrations in Soil



LEGEND

- PRIMARY SOURCE AREA
- EXTENT OF CVOC GROUNDWATER IMPACTS ABOVE CULs
- UB19 — SOIL BORING (UEP)
- MW10 — MONITORING WELL (UEP)
- B17/MW09 — GROUNDWATER MONITORING WELL (SES)
- TB08/MW05 — TERRA MONITORING WELL
- B12 — ANGLED HOLLOW-STEM AUGER GROUNDWATER MONITORING WELL
- SB08 — PUSH-PROBE SOIL BORING
- B04 — HOLLOW-STEM AUGER SOIL BORING
- B12 — ANGLED HOLLOW-STEM AUGER SOIL BORING
- B-8 — SOIL BORING (HAHN AND ASSOCIATES, INC, 2000)
- B05 — SONIC SOIL BORING
- T6 — TERRA GEOTECHNICAL BORING
- SG05 — SOIL GAS SAMPLE
- INFERRED GROUNDWATER FLOW DIRECTION
- CATCH BASIN
- PROPERTY BOUNDARY
- RED — DENOTES CONCENTRATION IN GROUNDWATER EXCEEDS MTCA METHOD A CLEANUP LEVELS
- GREEN — DENOTES CONCENTRATION IN GROUNDWATER BELOW MTCA METHOD A CLEANUP LEVELS

GROUNDWATER CLEANUP LEVELS

PCE	5 µg/L
TCE	5 µg/L
Cis DCE	16 µg/L
VC	0.2 µg/L

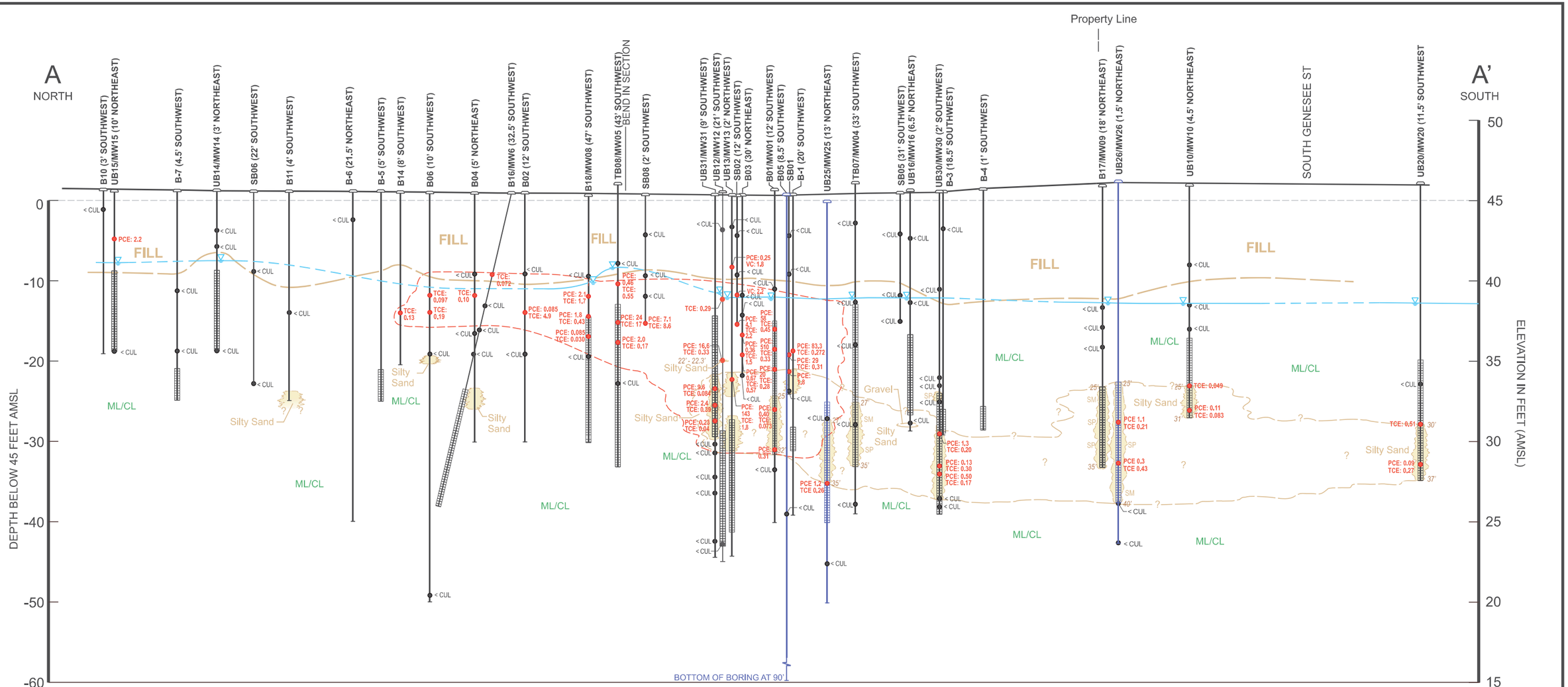
A — A' CROSS SECTION LOCATION

NOTE: GROUNDWATER CONCENTRATIONS DEPICTED ON THIS FIGURE ARE FROM MOST RECENT SAMPLING EVENTS.

Urban Environmental Partners llc
Diligent, responsive, and practical consulting!

Rainier Mall Site
4208 Rainier Avenue South
Seattle, WA

Figure 5
CVOC Concentrations in Groundwater



LEGEND

(1' SOUTH) OFFSET 1' SOUTH

MONITORING WELL

SCREEN INTERVAL

GROUNDWATER LEVEL

SONIC BORING

APPROXIMATE EXTENT OF SOIL SOURCE AREA

CONCENTRATIONS OF CHEMICALS OF CONCERN IN SOIL (mg/kg):

- CONCENTRATION BELOW MTCA METHOD A CLEANUP LEVEL
- CONCENTRATION ABOVE MTCA METHOD A CLEANUP LEVEL

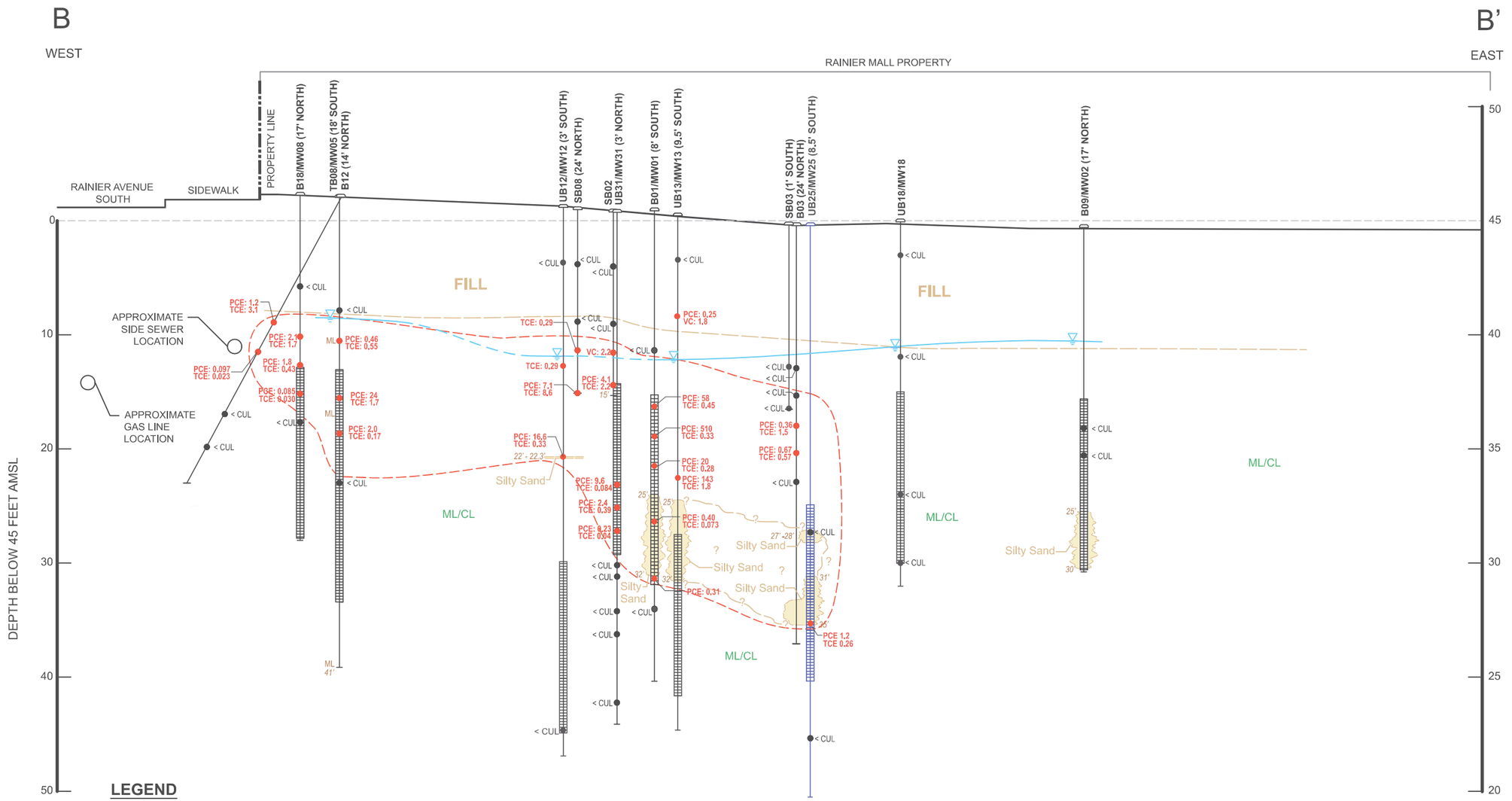
mg/kg	MILLIGRAMS PER KILOGRAM
µg/L	MICROGRAMS PER LITER
RED	DENOTES CONCENTRATIONS EXCEEDING MTCA METHOD A CLEANUP LEVELS
PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
bgs	BELOW GROUND SURFACE
VC	VINYL CHLORIDE
< CUL	BELOW CLEANUP LEVEL PCE CUL (SOIL) = 0.05 mg/kg

Horizontal Scale in Feet
0 20 40
0 5 10
Vertical Scale in Feet
Vertical Exaggeration X 4

Urban Environmental Partners llc
Diligent, responsive, and practical consulting!

Rainier Mall Site
4208 Rainier Avenue South
Seattle, WA

Figure 12
Cross Section A-A' with CVOC Concentrations in Soil



LEGEND

Horizontal Scale in Feet
0 10 20
0 5 10
Vertical Scale in Feet
Vertical Exaggeration X 2

(1' SOUTH) OFFSET 1' SOUTH MONITORING WELL

SCREEN INTERVAL

GROUNDWATER LEVEL

SONIC BORING

APPROXIMATE EXTENT OF SOIL SOURCE AREA

CONCENTRATIONS OF CHEMICALS OF CONCERN IN SOIL (mg/kg):

- CONCENTRATION BELOW MTCA METHOD A CLEANUP LEVEL
- CONCENTRATION ABOVE MTCA METHOD A CLEANUP LEVEL

mg/kg	MILLIGRAMS PER KILOGRAM
µg/L	MICROGRAMS PER LITER
RED	DENOTES CONCENTRATIONS EXCEEDING MTCA METHOD A CLEANUP LEVELS

PCE	TETRACHLOROETHENE
TCE	TRICHLOROETHENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
bgs	BELOW GROUND SURFACE
VC	VINYL CHLORIDE
< CUL	BELOW CLEANUP LEVEL PCE CUL (SOIL) = 0.05 mg/kg

Urban Environmental Partners llc
Diligent, responsive, and practical consulting!

Rainier Mall Site
4208 Rainier Avenue South
Seattle, WA

Figure 14
Cross Section B-B' with CVOC Concentrations in Soil

Enclosure B

Analysis and Opinion Table

Detailed Ecology Comments on Remedial Investigation / Feasibility Study and Cleanup Action Plan (*RI/FS and CAP*), Rainier Mall Property

Comment Number	Section and Paragraph	Page Number	Review Comment
1	General	I	With anticipation of the Site cleanup being managed under a Prospective Purchaser Consent Decree, the included comments only cover the remedial investigation (RI) and feasibility study (FS). The Draft CAP (dCAP) needs to be separated as a stand alone document that details the preferred alternative . Under a Consent Decree or Agreed Order, the dCAP will be an Ecology document. Ecology determines what will be in the final CAP and considers input received during a public comment period on the dCAP.
2	2.4.2, para.1	4	"Shallow groundwater in the vicinity of the property does not appear to serve as a source of drinking water" Whether local groundwater is a source of drinking water needs to be definitively identified.
3	2.5.13	18	What is the estimated distance from the nearest piling to UB32 and UB33?
4	2.5.14	20	3rd open bullet states, "CVOCs below their laboratory reporting limit and/or MTCA Method A Cleanup Level." When this language is used is the reporting limit always below MTCA CULs?
5	3.4.1	25	2nd paragraphs states, "migrate horizontally downward". Please clarify what this means.
6	3.4.1	26	Positive ORP values and DO values greater than 0.5 mg/L in many wells suggest optimal reducing conditions for bioremediation are not present.
7	3.4.2	26	Include that 4 quarterly qroundwater monitoring events will be conducted.
8	3.5	27	Shallow soil impacts on the western boundary have not been delineated with soil samples. Discuss limitations due to the utility corridor that is being monitored.
9	3.6	28	The western point of groundwater compliance should be MW6 in conjunction with air sampling of the sanitary sewer utility line directly west and presumed in contact with groundwater.
10	3.7.3	29	Include a discussion of potential vapor transport through utility lines, particularly due to the proximity of the sanitary sewer lines to soil and groundwater impacts.
11	3.8	30	Documentation of the TEE Exclusion (Ecology form) was not included in the *RI/FS and CAP* . Please add this form.
12	4.2	31-32	ARARSs should include Air Quality Regulations, and General Occupational Health Standards
13	4.4.1, para. 1	34	The traditional conditional point of compliance is 6 ft due to TEE considerations. A feasibility study is required comparing meeting the standard soil point of compliance of 15 ft below grade, and the proposed conditional point of compliance.
14	4.4.2, 4.4.3	34	Point of compliance is throughout the site
15	4.7	41	What lab data shows a significant anaerobic environment? DO and ORP data shows a borderline anaerobic environment.
16	4.8	41-48	Section 4.8 is the description of alternatives. The description of alternatives should be separate from the evaluation of alternatives.
17	4.8	42	An environmental convenant will be required for the proposed cPAH in soil remedy consisting of leaving contamination in place below 4 feet below grade.
18	4.8, 1st para. after bullets	42	States "Each of the four remedial alternatives also include the excavation of CVOC impacted soil in the vicinity of UB15 and the upper four feet of PAH impacted material adjacent to the treated piles. Source removal was deemed to be the most practical and cost effective approach in these areas during preliminary remedial alternative screening and did not appear to warrant a feasibility level assessment." However, the cost is not in the estimate tables and it will vary based on the other items in the remedy.
19	4.8.1, para. 1	43	States "any ponded and recovered water during excavation will be treated off site as a hazardous waste. Recovered groundwater and other collected water during remedial excavation will be treated on site using activated carbon and discharged to the nearest sanitary sewer under a King County discharge permit." Which option is planned for the water collected in the excavation?

20	4.8.2, para. 3	44	States "Due to access issues, active DPE is not planned for impacted groundwater at the southern ROW at Genesee, however performing cleanup of the upgradient source area will enhance the attenuation in this area within the operation timeframe." If this is true then the number of probes/wells on Figure 17 are misrepresenting the actual remedy proposed. The number of wells in Table 11 also over estimate DPE well installation.
21	4.8.3	44	The proposed ERH/SVE network does not treat the whole cVOC groundwater plume as shown in Figure 18.
22	4.8.4, para. 4	47	This paragraph describes the possibility of multiple injections of ISCR but does not include the criteria that will be used to determining if additional injections are required. Please include how this will be determined.
23	4.8.3 and 4.8.4	46, 48	Please provide remediation duration projections for Alternatives 3 and 4.
24	4.8	48	There needs to be a remediation alternative including source removal by excavation and ISCR to treat groundwater outside the source area, as a benchmark.
25	4.9	48-50	This section is confusing due to structure and repetition. It appears to be representing the highest scoring alternative for each criteria and then summarizing by grouping under alternative. Justification for scoring is not clear. Excavation and removal is usually considered the most permanent and is typically scored higher than 5. This section should be edited to clarify the scoring justification for each alternative and provide evidence or claims.
26	4.9	49	Permanence. DPE is given a permanance score of 4 because the system can not extend into Genesee, and because it is dependent on hydrology and stratigraphy. All of these also apply to the ERH/SVE and ISCR approaches. The well extraction/injection methods should have similar permanence scores.
27	4.9	49	Long term effectiveness. All technologies will include a compliance sampling program and rely on the site control of a vapor barrier. This would also effect the score of Protectiveness. ERH/SVE/ISCR all have uncertainty in radius of influence and degradation potential. Long term effectiveness of source area removal by excavation should be the highest.
28	4.9	52	Alernative 4 Summary: Positive ORP and DO greater than 0.5 mg/L do not indicate strong reducing conditions.
29	4.9	52	Alernative 4 Summary: Provide support of ERH and ISCR exhibiting similar protectiveness.
30	4.9, last para.	51	Alternative 2 does not cover the area listed so the evaluation is not complete. please revise to cover the actual proposed area.
31	4.10	52	Please include a graph showing the break in choosing the preferred alternative, including cost and CBS. The graph should include the benchmark alternative of excavation and ISCR injections.
32	Figure 17		The figure does not match the text. If probes/wells are not to be installed in the road they should be removed and should not be in the costs.
33	Figure 19		Injection wells are in the silt/clay in the same density as the sand. Is that an accurate assumption?
34	All tables		The text in all of the data tables is too small. Increase the text size for the data to be at least 10 point.
35	General		Entry of Site data into EIM must be completed and confirmed prior to issuance of a NFA opinion letter. To date, none of the Site data has been entered. Ecology recognizes the difficulty of manually entering data from historical hard copy reports into EIM. Therefore, we request that the consultant determine the earliest date that electronic laboratory data are available and upload data from that date forward into EIM. Information regarding EIM can be found at: https://ecology.wa.gov/Research-Data/Data-resources/Environmental-Information-Management-database