ZipperGeo
Geoprofessional Consultants

February 11, 2021

Mill Creek Crossing LLC
22833 Bothell Everett Highway, Suite 207
Bothell, Washington 98021

Attn: Mr. Nicholas Echelbarger

**Re: December 2020 Groundwater Monitoring Report – Former Prime Cleaners**
18001 Bothell Everett Highway
Bothell, Snohomish County, Washington
ZGA Project No. 1001.25
VCP #NW2571

Dear Mr. Echelbarger:

Zipper Geo Associates, LLC (ZGA) is pleased to submit this Groundwater Monitoring Report for the above referenced site. This investigation was performed in general accordance with ZGA's Proposal No. P14297R, dated July 2, 2015 and includes results for sampling events completed in December 2019.

We appreciate the opportunity to perform these services for Mill Creek Crossing LLC. Please contact the undersigned at (425) 582-9928 if you have questions regarding the information provided in the report.

Sincerely,
**Zipper Geo Associates, LLC**

Jeffrey S. Tinklepaugh, LG
Project Geologist

Jon M. Einarsen, LG
Principal

Attachments: Appendix A – Figures
Appendix B – Laboratory Reports

## Introduction

A dual-phase extraction (DPE) system has been installed at the Site to treat soil and groundwater that has been impacted by tetrachloroethylene (PCE) due to historical use of two adjoining tenant spaces for dry cleaning activities. The DPE system was first started on February 1, 2017. After troubleshooting several electrical and mechanical issues that were causing the system to automatically shut down, the system ran more or less continuously from June of 2017, with periodic shutdowns for maintenance and groundwater sampling, until February of 2018. At that time the system was shut down to accommodate tenant improvements to the former Prime Cleaners tenant space (being converted to a restaurant), which included improvements to the DPE groundwater effluent plumbing system. Upon completion of their inspection of tenant improvements, the Alderwood Water and Wastewater District informed ZGA that a permit with that entity was required. ZGA prepared the documentation, acquired the permit, and the system was restarted in October 2018. The system has run more or less continuously since that time, with periodic shutdowns for maintenance, repairs and groundwater sampling.

This groundwater monitoring report presents a summary of a groundwater sampling event completed in December 2019, which is the sixth sampling event since system startup. The scope of the monitoring study is generally to sample 10 groundwater wells located proximal to the former dry cleaning facilities on the southwest part of the Mill Creek Crossing Retail Center. Based on a prior history of non-detections in the other wells, only MW-3, MW-4, and MW-8 were sampled for this sampling event. Results from the monitoring study are used to assess trends in concentrations of volatile organic compounds (VOC), particularly tetrachloroethylene (PCE), and its degradational products trichloroethylene (TCE), 1,1-dichlorethene, cis-1,2-dichloroethylene (cis-1,2-DCE), and trans-1,2-dichloroethylene (trans-1,2-DCE), and vinyl chloride. 1,1-dichlorethene and the end-member degradational product vinyl chloride have never been detected at the Site.

**Table 1. Project Information**

| | |
|---|---|
| **Site Name** | Former Prime Cleaners |
| **Site Location/Address** | 18001 Bothell-Everett Highway |
| **VCP #** | NW2571 |
| **Sampling Schedule** | No fixed schedule |
| **Sampling Dates (this report)** | December 9, 2020 |
| **Wells Sounded** | MW-3, MW-4, MW-8 |
| **Wells Sampled** | MW-3, MW-4, MW-8 |
| **Next Sampling Event** | TBD |

## Groundwater Flow

Ten dedicated groundwater monitoring wells are present on or adjoining the Site (MW-1 through MW-10). Depth to groundwater was measured in relation to the north side of the PVC casing of each well. Generally, we observed a southerly trend to groundwater flow, consistent with previous sampling events. Relative groundwater elevations measured during previous sampling events and the event discussed in this report are presented in Table 2. A groundwater contour map for the December 2020 sampling event is attached as Figure 1.

**Table 2. Groundwater Elevations**

| Well ID | Relative Casing Elevation (ft.) | Date of Measurement | Depth to Groundwater (ft.) | Relative Groundwater Elevation (ft.) |
|---|---|---|---|---|
| MW-1 | 296.31 | 08-25-2010 | 25.22 | 271.09 |
| | | 05-09-2011 | 21.18 | 275.13 |
| | | 05-23-2012 | 22.73 | 273.58 |
| | | 03-05-2014 | 23.95 | 272.36 |
| | | 01-09-2017 | 22.85 | 273.46 |
| | | 08-17-2017 | 24.87 | 271.44 |
| | | 11-14-2017 | 24.66 | 271.65 |
| | | 02-13-2018 | 21.65 | 274.66 |
| | | 01-14-2019 | 23.78 | 272.53 |
| | | 04-10-2019 | 24.04 | 272.27 |
| | | 12-03-2020 | 23.95 | 272.36 |
| MW-2 | 296.47 | 08-25-2010 | 25.58 | 270.89 |
| | | 05-09-2011 | 21.61 | 274.86 |
| | | 05-23-2012 | 22.97 | 273.50 |
| | | 03-05-2014 | 24.28 | 272.19 |
| | | 01-09-2017 | 23.14 | 273.33 |
| | | 08-17-2017 | 25.57 | 270.90 |
| | | 11-14-2017 | 25.15 | 271.32 |
| | | 02-13-2018 | 22.00 | 274.47 |
| | | 01-14-2019 | 24.05 | 272.42 |
| | | 04-10-2019 | 24.40 | 272.07 |
| | | 12-03-2020 | 24.30 | 272.17 |
| MW-3 | 296.96 | 08-25-2010 | 26.17 | 270.79 |
| | | 05-09-2011 | 22.21 | 274.75 |
| | | 05-23-2012 | 23.49 | 273.47 |
| | | 03-05-2014 | 24.88 | 272.08 |
| | | 01-09-2017 | 23.66 | 273.30 |
| | | 08-17-2017 | 26.10 | 270.86 |
| | | 11-14-2017 | 25.69 | 271.27 |
| | | 02-13-2018 | 22.45 | 274.51 |
| | | 01-14-2019 | 24.53 | 272.43 |
| | | 04-10-2019 | 24.92 | 272.04 |
| | | 12-09-2019 | 26.53 | 270.43 |
| | | 12-03-2020 | 24.82 | 272.14 |
| MW-4 | 296.56 | 08-25-2010 | 25.76 | 270.80 |
| | | 05-09-2011 | 21.77 | 274.79 |
| | | 05-23-2012 | 23.10 | 273.46 |
| | | 03-05-2014 | 24.47 | 272.09 |
| | | 01-09-2017 | 23.21 | 273.35 |
| | | 08-17-2017 | 25.67 | 270.89 |
| | | 11-14-2017 | 25.32 | 271.24 |
| | | 02-13-2018 | 22.10 | 274.46 |
| | | 01-14-2019 | 24.16 | 272.40 |
| | | 04-10-2019 | 24.53 | 272.03 |
| | | 12-09-2019 | 26.12 | 270.44 |
| | | 12-03-2020 | 24.44 | 272.12 |

| Well ID | Relative Casing Elevation (ft.) | Date of Measurement | Depth to Groundwater (ft.) | Relative Groundwater Elevation (ft.) |
|---|---|---|---|---|
| MW-5 | 289.85 | 08-25-2010 | 18.71 | 271.14 |
| | | 05-09-2011 | 14.96 | 274.89 |
| | | 05-23-2012 | 16.18 | 273.67 |
| | | 03-05-2014 | 17.49 | 272.36 |
| | | 01-09-2017 | 17.36 | 272.49 |
| | | 08-17-2017 | 18.71 | 271.14 |
| | | 11-14-2017 | 18.51 | 271.34 |
| | | 02-13-2018 | 15.52 | 274.33 |
| | | 01-14-2019 | 17.59 | 272.26 |
| | | 04-10-2019 | 17.64 | 272.21 |
| | | 12-03-2020 | 17.85 | 272.00 |
| MW-6 | 289.94 | 08-25-2010 | 18.91 | 271.03 |
| | | 05-09-2011 | 15.06 | 274.88 |
| | | 05-23-2012 | 16.30 | 273.64 |
| | | 03-05-2014 | 17.54 | 272.40 |
| | | 01-09-2017 | 16.44 | 273.50 |
| | | 08-17-2017 | 18.81 | 271.13 |
| | | 11-14-2017 | 18.71 | 271.23 |
| | | 02-13-2018 | 15.53 | 274.41 |
| | | 01-14-2019 | 17.64 | 272.30 |
| | | 04-10-2019 | 17.66 | 272.28 |
| | | 12-03-2020 | 17.77 | 272.17 |
| MW-7 | 289.72 | 08-25-2010 | 19.14 | 270.58 |
| | | 05-09-2011 | 15.22 | 274.50 |
| | | 05-23-2012 | 16.41 | 273.31 |
| | | 03-05-2014 | 17.85 | 271.87 |
| | | 01-09-2017 | 16.61 | 273.11 |
| | | 08-17-2017 | 19.11 | 270.61 |
| | | 11-14-2017 | 18.68 | 271.04 |
| | | 02-13-2018 | 15.51 | 274.21 |
| | | 01-14-2019 | 17.52 | 272.20 |
| | | 04-10-2019 | 17.84 | 271.88 |
| | | 12-03-2020 | 17.84 | 271.88 |
| MW-8 | 290.56 | 08-25-2010 | Not Installed | |
| | | 05-09-2011 | 16.02 | 274.54 |
| | | 05-23-2012 | 17.21 | 273.35 |
| | | 03-05-2014 | 18.69 | 271.87 |
| | | 01-09-2017 | 17.47 | 273.09 |
| | | 08-17-2017 | 19.91 | 270.65 |
| | | 11-14-2017 | 19.46 | 271.10 |
| | | 02-13-2018 | 16.30 | 274.26 |
| | | 01-14-2019 | 18.30 | 272.26 |
| | | 04-10-2019 | 18.61 | 271.95 |
| | | 12-09-2019 | 20.28 | 270.28 |
| | | 12-03-2020 | 18.81 | 271.75 |

| Well ID | Relative Casing Elevation (ft.) | Date of Measurement | Depth to Groundwater (ft.) | Relative Groundwater Elevation (ft.) |
|---|---|---|---|---|
| MW-9 | 298.90 | 08-25-2010 | Not Installed | |
| | | 05-09-2011 | | |
| | | 05-23-2012 | | |
| | | 03-05-2014 | 26.30 | 272.60 |
| | | 01-09-2017 | 25.10 | 273.80 |
| | | 08-17-2017 | 27.55 | 271.35 |
| | | 11-14-2017 | 27.52 | 271.38 |
| | | 02-13-2018 | 24.35 | 274.55 |
| | | 01-14-2019 | 26.43 | 272.47 |
| | | 04-10-2019 | 26.73 | 272.17 |
| | | 12-03-2020 | 26.75 | 272.15 |
| MW-10 | 297.49 | 08-25-2010 | Not Installed | |
| | | 05-09-2011 | | |
| | | 05-23-2012 | | |
| | | 03-05-2014 | 25.19 | 272.30 |
| | | 01-12-2017 | 24.17 | 273.32 |
| | | 08-18-2017 | 26.21 | 271.28 |
| | | 11-14-2017 | 25.91 | 271.58 |
| | | 02-13-2018 | 22.85 | 274.64 |
| | | 01-14-2019 | 24.94 | 272.55 |
| | | 04-10-2019 | 25.25 | 272.24 |
| | | 12-03-2020 | 25.19 | 272.30 |

**Groundwater Sampling and Analysis**

Each groundwater monitoring well was purged using a portable bladder pump equipped with a disposable bladder and dedicated tubing. The pump was lowered gently into the water column to a depth that corresponded with the highest concentration of PCE observed in that well in soil during the remedial investigations. If no PCE was measured in soil in a well, the pump was set at the mid-point of the screen. Flow rates were maintained at approximately 0.1 to 0.3 liters per minute. During the purging process, groundwater quality parameters Including temperature, electrical conductivity (EC), pH, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) were measured at regular Intervals using a Horiba U-22 water-quality meter equipped with a flow cell. Purging at a given well was considered complete when: DO and turbidity were within +/- 10% variance; pH was within +/- 0.1 variance; EC was with +/- 3% variance; and ORP was within +/- 10 mV. All non-disposable pump components were decontaminated after sampling by rinsing with potable water, scrubbing in a solution of Alconox™ and potable water, and a final rinse with distilled water. Purge water and decontamination water were stored in a sealed, labeled 50-gallon drum at the Site and are awaiting classification and off-site disposal.

Groundwater samples were collected after parameter stabilization into laboratory-supplied glass 40-mL VOA vials preserved with hydrochloric acid. Sample containers were labeled with the well ID, the project name, the project number, the date, and the time of collection. Sample containers were immediately stored in a chilled cooler and were later transferred to a dedicated refrigerator in our office. Sample containers were transported to Field Environmental Instruments (FEI) in Woodinville in a chilled cooler under chain of custody procedures. FEI functioned as an intermediary to the analytical laboratory: Pace Analytical (formerly Environmental Science Corporation), a Washington State accredited laboratory. All samples were analyzed by Pace at their central laboratory, located in Tennessee.

The analytical results are summarized in Table 3, and are compared to cleanup levels defined in the Model Toxics Control Act (WAC 173-340).

**Groundwater Sampling Analytical Results (December 2020)**

The following results were drawn from the analysis of groundwater samples collected from MW-3, MW-4, and MW-8. MW-1, MW-2, MW-5, MW-6, MW-7, MW-9, and MW-10 were not sampled during this groundwater monitoring event. The executed chain-of-custody forms and laboratory analytical certificates are provided in Appendix B.

- PCE was detected at concentrations that exceeded the MTCA Method A cleanup level (5 µg/L) in each of the three monitoring wells sampled during this event. Concentrations of detectable PCE in each well were as follows: MW-3 (23.6 µg/L); MW-4 (18.6 µg/L and duplicate 17.3 µg/L), and MW-8 (6.45 µg/L).

No other VOC were reported above laboratory RDLs in MW-3, MW-4, and MW-8.

The reported concentrations of PCE has never exceeded the MTCA Method B Screening Level for Vapor Intrusion in MW-3, and has not exceeded the Screening Level in MW-8 for six consecutive sampling events. The Screening Level was not exceeded in two of the last three sampling events in MW-4.

**Table 3. Groundwater Analytical Results**

| Monitoring Well | Date | Volatile Organic Compounds (µg/L) | | | |
|---|---|---|---|---|---|
| | | PCE | TCE | Cis-1,2-DCE | Trans-1,2-DCE |
| MW-1 | 06-17-09 | **12** | ND<1 | 4.8 | ND<1 |
| | 08-10-10 | ND<1 | **3.2** | **1.4** | ND<1 |
| | 05-10-11 | **1.3** | ND<1 | ND<1 | ND<1 |
| | 05-23-12 | ND<2 | ND<2 | ND<2 | ND<2 |
| | 03-05-14 | ND<2 | ND<2 | ND<2 | ND<2 |
| | 01-11-17 | **0.508** | ND<1 | ND<1 | ND<1 |
| | 08-18-17 | **0.431** | ND<1 | ND<1 | ND<1 |
| | 11-15-17 | **0.231** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-13-18 | **0.300** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-14-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-10-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| MW-2 | 06-16-09 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 08-12-10 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 05-10-11 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 05-24-12 | ND<2 | ND<2 | ND<2 | ND<2 |
| | 03-05-14 | ND<2 | ND<2 | ND<2 | ND<2 |
| | 01-11-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 08-17-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 11-14-17 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-13-18 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-14-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-10-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| MW-3 | 06-17-09 | **6.6** | ND<1 | ND<1 | ND<1 |
| | 08-12-10 | **6.4** | ND<1 | ND<1 | ND<1 |
| | 05-10-11 | **9.3** | ND<1 | ND<1 | ND<1 |
| | 05-24-12 | **15** | ND<2 | ND<2 | ND<2 |
| | 03-07-14 | **5.6** | ND<2 | ND<2 | ND<2 |
| | 01-12-17 | **9.28** | ND<1 | ND<1 | ND<1 |
| | 08-21-17 | **2.81** | ND<1 | ND<1 | ND<1 |
| | 11-16-17 | **4.96** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-14-18 | **6.78** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 | **4.44** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 | **2.51** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-09-19 | **3.22** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-03-20 | **23.6** | ND<0.5 | ND<0.5 | ND<0.5 |
| ***MTCA Method A Cleanup Level*** | | ***5[A]*** | ***5[A]*** | ***16[B]*** | ***160[B]*** |
| ***MTCA Method B Groundwater Screening Level for Vapor Intrusion*** | | ***24*** | ***1.5*** | ***16*** | ***160*** |

| Monitoring Well | Date | Volatile Organic Compounds (µg/L) | | | |
|---|---|---|---|---|---|
| | | PCE | TCE | Cis-1,2-DCE | Trans-1,2-DCE |
| MW-4 | 10-31-07 | **45** | ND<1 | ND<1 | ND<1 |
| | 06-16-09 | **170** | ND<1 | ND<1 | ND<1 |
| | 08-12-10 | **140** | ND<1 | ND<1 | ND<1 |
| | 05-10-11 | **110** | ND<1 | ND<1 | ND<1 |
| | 05-24-12 | **140** | ND<2 | ND<2 | ND<2 |
| | 03-07-14 | **44** | ND<2 | ND<2 | ND<2 |
| | 01-13-17 | **96.1** | ND<1 | ND<1 | ND<1 |
| | 01-13-17 DUP | **95.8** | ND<1 | ND<1 | ND<1 |
| | 08-21-17 | **76.5** | ND<1 | ND<1 | ND<1 |
| | 11-16-17 | **50.8** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 11-16-17 DUP | **56.9** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-14-18 | **28.5** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 | **10.7** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 DUP | **10.6** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 | **22.5** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 DUP | **21.8** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-09-19 | **42.9** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-09-19 DUP | **40.9** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-04-20 | **18.6** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-04-20 Dup | **17.3** | ND<0.5 | ND<0.5 | ND<0.5 |
| MW-5 | 08-10-10 | **0.61** | ND<1 | ND<1 | ND<1 |
| | 05-09-11 | **0.60** | ND<1 | ND<1 | ND<1 |
| | 03-06-14 | ND<2 | ND<2 | ND<2 | ND<2 |
| | 01-12-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 08-18-17 | **0.281** | ND<1 | ND<1 | ND<1 |
| | 11-15-17 | **0.259** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-13-18 | **0.220** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| MW-6 | 08-10-10 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 05-09-11 | **2.2** | ND<1 | ND<1 | ND<1 |
| | 03-06-14 | **4.7** | ND<2 | ND<2 | ND<2 |
| | 01-12-17 | **1.07** | ND<1 | ND<1 | ND<1 |
| | 08-21-17 | **0.674** | ND<1 | ND<1 | ND<1 |
| | 11-15-17 | **2.37** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-14-18 | **3.21** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 | **2.04** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| ***MTCA Method A Cleanup Level*** | | ***5[A]*** | ***5[A]*** | ***16[B]*** | ***160[B]*** |
| ***MTCA Method B Groundwater Screening Level for Vapor Intrusion*** | | ***24*** | ***1.5*** | ***16*** | ***160*** |

| Monitoring Well | Date | Volatile Organic Compounds (µg/L) | | | |
|---|---|---|---|---|---|
| | | PCE | TCE | Cis-1,2-DCE | Trans-1,2-DCE |
| MW-7 | 08-10-10 | **0.55** | ND<1 | ND<1 | ND<1 |
| | 05-09-11 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 03-06-14 | **8.0** | ND<2 | ND<2 | ND<2 |
| | 01-12-17 | **0.948** | ND<1 | ND<1 | ND<1 |
| | 08-21-17 | **1.49** | ND<1 | ND<1 | ND<1 |
| | 11-15-17 | **3.8** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-14-18 | **1.93** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 | **3.88** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| MW-8 | 05-10-11 | **22** | ND<1 | ND<1 | ND<1 |
| | 05-24-12 | **36** | ND<2 | ND<2 | ND<2 |
| | 03-07-14 | **13** | ND<2 | ND<2 | ND<2 |
| | 01-13-17 | **26.4** | ND<1 | ND<1 | ND<1 |
| | 08-21-17 | **25.1** | ND<1 | ND<1 | **0.250** |
| | 11-16-17 | **19.2** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-14-18 | **16.1** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-14-18 DUP | **14.7** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 | **12.1** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 | **14.3** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-09-19 | **17.5** | ND<0.5 | ND<0.5 | ND<0.5 |
| | 12-04-20 | **6.45** | ND<0.5 | ND<0.5 | ND<0.5 |
| MW-9 | 03-05-14 | ND<2 | ND<2 | ND<2 | ND<2 |
| | 01-11-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 08-18-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 11-14-17 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-13-18 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-14-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-10-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| MW-10 | 03-06-14 | ND<2 | ND<2 | ND<2 | ND<2 |
| | 01-12-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 08-18-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 11-14-17 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-13-18 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-14-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-10-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| ***MTCA Method A Cleanup Level*** | | ***5[A]*** | ***5[A]*** | ***16[B]*** | ***160[B]*** |
| ***MTCA Method B Groundwater Screening Level for Vapor Intrusion*** | | ***24*** | ***1.5*** | ***16*** | ***160*** |

| Monitoring Well | Date | Volatile Organic Compounds (µg/L) | | | |
|---|---|---|---|---|---|
| | | PCE | TCE | Cis-1,2-DCE | Trans-1,2-DCE |
| Equipment Blank | 08-12-10 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 01-13-17 | ND<1 | ND<1 | ND<1 | ND<1 |
| | 11-16-17 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 02-14-18 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-15-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 04-11-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| DPE Groundwater Effluent | 03-08-17 | 0.748 | ND<1 | ND<1 | ND<1 |
| | 11-12-17 | 0.286 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 01-11-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| | 05-16-19 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 |
| ***MTCA Method A Cleanup Level*** | | ***5[A]*** | ***5[A]*** | ***16[B]*** | ***160[B]*** |
| ***MTCA Method B Groundwater Screening Level for Vapor Intrusion*** | | ***24*** | ***1.5*** | ***16*** | ***160*** |

ug/L: micrograms per liter (parts-per-billion); ND<: Not detected above indicated laboratory reporting detection limit; Shaded values exceed MTCA Method A cleanup levels. [A]: Method A cleanup level. [B]: Method B cleanup level. Please refer to Appendix C for the complete set of analytes and analytical results for VOC.

**Indoor Air Sampling and Analysis (January 2020)**

***Air Sampling Narrative***

During the January 2020 sampling event, all three tenant spaces were open for businesses, and the Former Prime Cleaners was fully converted into a restaurant. The north and south doors at all three tenant spaces were closed. The indoor air canister in the Money Tree tenant space was placed on a refrigerator at an elevation of about seven feet in a back room (south part of the tenant space). The indoor air canister in the Former Prime Cleaners was placed at an elevation of about seven feet on a cooler in the dining area (central part of the tenant space). The indoor air canister at the Osaka Grill was placed at an elevation of about seven feet on a cooler in the dining area (central part of the tenant space). The canister for ambient outdoor air was placed on the roof of the Conex box that houses the dual-phase extraction (DPE) system in the alley south of the tenant spaces.

All four canisters were equipped with 8-hour regulators. The samples were analyzed for a subset of VOC, including tetrachloroethylene (PCE) and trichloroethylene (TCE), by Friedman & Bruya (Seattle, Washington) using the EPA TO-15 Method. The analytical results are summarized in Table 1 and the laboratory reports are attached in Appendix B. Contaminant concentrations in indoor air have been corrected for concentrations in ambient air, if applicable. The Commercial Method B calculation is illustrated on Table 5.

**Table 4. Summarized Ambient and Indoor Air Analytical Results**

| Sampling Location | Date | PCE | TCE | EDC |
|---|---|---|---|---|
| Ambient Air | 06-03-14 | <0.23 | <0.18 | <0.14 |
| | 08-22-18 | <0.68 | **0.28** | **0.24** |
| | 01-14-19 | <6.8 | <0.27 | **0.11** |
| | 04-18-19 | <6.8 | <0.27 | **0.089** |
| | 01-24-20 | <6.8 | <0.27 | **0.069** |
| Former Prime Cleaners | 06-03-14 | 0.51 | **0.39** | <0.13 |
| | 08-22-18 | 0.73 | <0.27 | <0.04 |
| | 01-14-19 | <6.8 | <0.27 | **0.01** |
| | 04-18-19 | <6.8 | <0.27 | **0.008** |
| | 01-24-20 | <6.8 | <0.27 | **0.008** |
| Money Tree | 06-03-14 | <1.1 | <0.88 | <0.66 |
| | 08-22-18 | <0.68 | **0.82** | 0.00 |
| | 01-14-19 | <6.8 | <0.27 | 0.00 |
| | 04-18-19 | <6.8 | <0.27 | **0.004** |
| | 01-24-20 | <6.8 | <0.27 | **0.004** |
| Osaka Grill | 06-03-14 | 0.48 | 0.07 | <0.28 |
| | 08-22-18 | <0.68 | <0.27 | 0.00 |
| | 01-14-19 | <6.8 | <0.27 | **0.02** |
| | 04-18-19 | <6.8 | <0.27 | **0.021** |
| | 01-24-20 | <6.8 | <0.27 | **0.041** |
| ***Default MTCA Method B Indoor Air Cleanup Level*** | | ***9.62*** | ***0.37*** | ***0.09*** |
| ***Commercial MTCA Method B Indoor Air Cleanup Level*** | | ***32.05*** | ***1.24*** | ***NC*** |

The bold values exceed the laboratory reporting limit. NC, not calculated. 0.00, the ambient concentration exceeds the indoor air concentration.

PCE and TCE were not reported above the laboratory reporting limit in ambient air or in any of the three tenant spaces during the December 2019 sampling event. This marks the third consecutive sampling event wherein PCE and TCE were not reported above the laboratory reporting limit.

**Table 5. Modified Method B Air Cleanup Level (Equation 750-2)**

| Equation 750-2 for Carcinogens | | | Tetrachloroethylene | | Trichloroethylene | |
|---|---|---|---|---|---|---|
| **Parameters[1]** | | **Units** | **Default Method B[2]** | **Modified Method B[3]** | **Default Method B[2]** | **Modified Method B[3]** |
| Carcinogenic Risk | RISK | unitless | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-06 |
| Average Body Weight | ABW | kg | 70 | 70 | 70 | 70 |
| Averaging Time | AT | years | 75 | 75 | 75 | 75 |
| Unit Conversion Factor | UCF | ug/mg | 1,000 | 1,000 | 1,000 | 1,000 |
| Carcinogenic Potency Factor | CPF | kg-day/mg | 9.10E-04 | 9.10E-04 | 0.0235 | 0.0235 |
| Breathing Rate | BR | $m^3$/day | 20 | 20 | 20 | 20 |
| Inhalation Adsorption Rate | ABS | unitless | 1 | 1 | 1 | 1 |
| Exposure Duration | ED | years | 30 | 30 | 30 | 30 |
| Exposure Frequency | EF | unitless | 1 | 0.3 | 1 | 0.3 |
| **Method B Air Cleanup Level** | | **ug/$m^3$** | **9.62** | **32.05** | **0.37** | **1.24** |

[1]Parameter values are derived from MTCA Equation 750-2 or the CLARC database (https://fortress.wa.gove/ecy/clarc/clarkdatatables.aspx)
[2]Default Method B cleanup level calculation using default parameters reflective of a residential setting
[3]Commercial Method B cleanup level calculation using an exposure frequency reflective of a commercial setting.

Method B air cleanup level = RISK x ABW x AT x UCF / CPF x BR x ABS x ED X EF

Exposure Frequency
Default: 24 hours/day for 365 days = 8,760 hours/year
Modified: 10 hours/day for 250 days = 2,500 hours/year

Modified Exposure Frequency = 2,500/8,760 = 0.285. However, in accordance with Ecology's Implementation Memorandum No. 21, dated November 15, 2018 (see Question No. 17 in the memorandum), we have used an exposure frequency value of 0.3 for the Modified Method B calculations.

ZipperGeo
Geoprofessional Consultants

**Conclusions**

ZGA completed a groundwater monitoring sampling event in December 2020. Historically, PCE has exceeded MTCA Method A cleanup levels in MW-3, MW-4 and MW-8. The concentration of PCE in MW-3 exceeded the MTCA Method A cleanup level for the first time since February of 2018. The concentrations of PCE in MW-4 and MW-8 remain above MTCA Method A cleanup levels.

The reported concentrations of PCE has never exceeded the MTCA Method B Screening Level for Vapor Intrusion in MW-3, and has not exceed the Screening Level in MW-8 for seven consecutive sampling events. The Screening Level was not exceeded in two of the last three sampling events in MW-4.

ZGA completed ambient and indoor air sampling in January 2020. PCE and TCE were not reported above laboratory reporting limits in ambient air or in three indoor air samples for the third consecutive sampling event.

ZGA intends to transmit this report to Ecology, along with a request for a “No Further Action” determination with an Environmental Covenant.

# APPENDIX A

Figures

# Appendix B

Laboratory Reports