

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

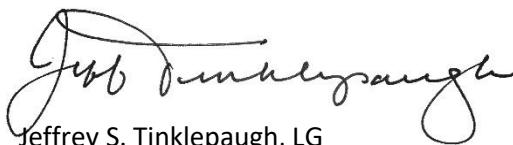
Dear Mr. Echelbarger:

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-dichloroethene, cis-1,2-dichloroethylene (cis-1,2-DCE), and trans-1,2-dichloroethylene (trans-1,2-DCE), and vinyl chloride. 1,1-dichloroethene 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
MW-4	296.56	12-03-2020	24.82	272.14
		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 within +/- 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/m³	9.62	32.05	0.37	1.24

¹Parameter values are derived from MTCA Equation 750-2 or the CLARC database (<https://fortress.wa.gov/ecy/clarc/clarkdatatables.aspx>)

²Default Method B cleanup level calculation using default parameters reflective of a residential setting

³Commercial 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.

Conclusions

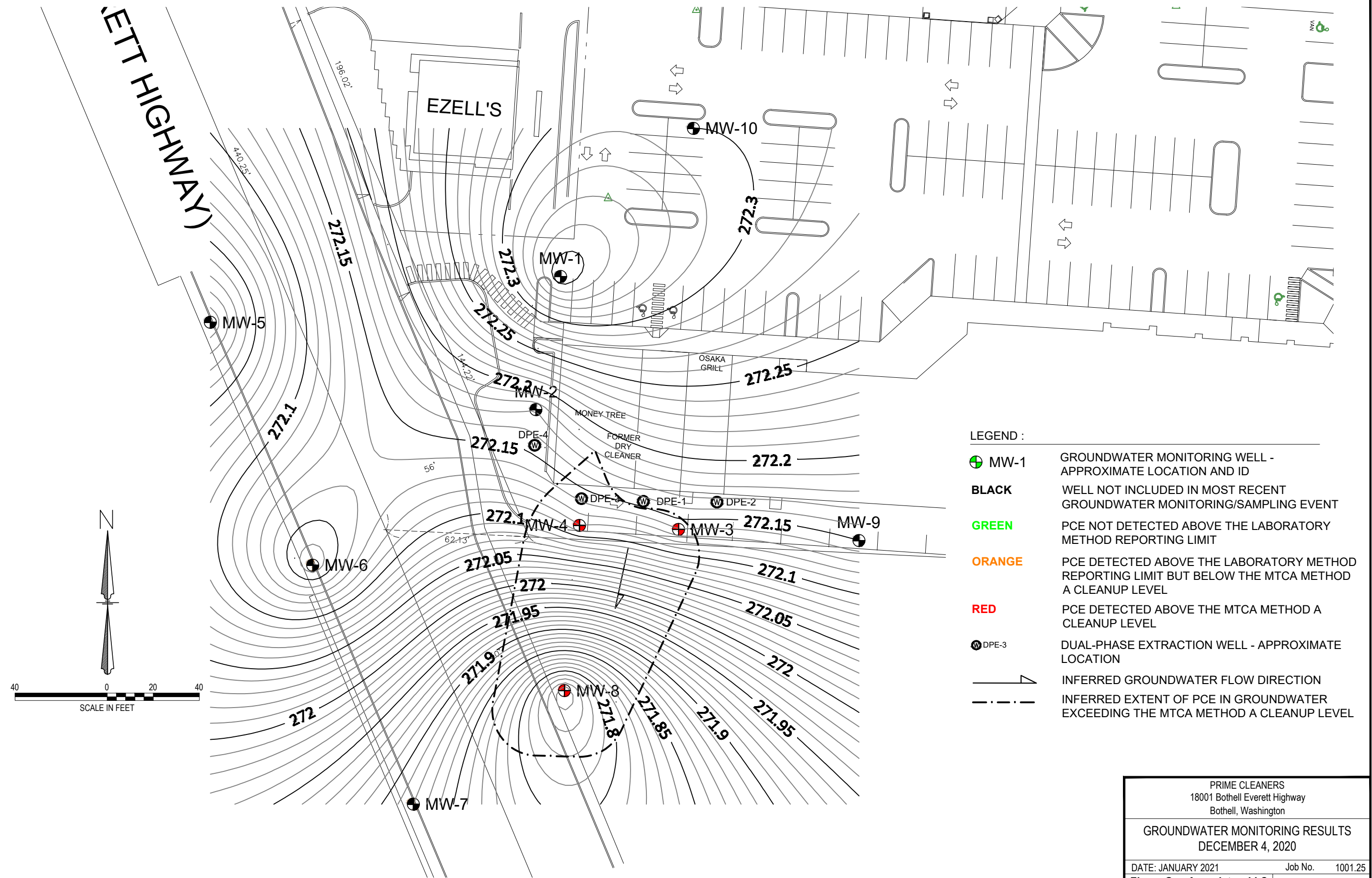
ZGA completed a groundwater monitoring sampling event in December 2020. Historically, PCE has exceeded MTCA Method A cleanup levels in MW-3, MW-4 and MW-8. The concentration of PCE in MW-3 exceeded the MTCA Method A cleanup level for the first time since February of 2018. The concentrations of PCE in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

APPENDIX A

Figures



PRIME CLEANERS 18001 Bothell Everett Highway Bothell, Washington		
GROUNDWATER MONITORING RESULTS DECEMBER 4, 2020		
DATE: JANUARY 2021	Job No.	1001.25
Zipper Geo Associates, LLC 19019 36th Ave. W., Suite E Lynnwood, WA	FIGURE	1
	SHT. 1 of 1	

Appendix B

Laboratory Reports

December 14, 2020

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

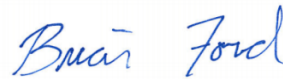
⁹ Sc

Zipper Geo Associates - Lynnwood, WA

Sample Delivery Group: L1293415
Samples Received: 12/05/2020
Project Number: 1001.25
Description: Prime Cleaners

Report To: Jon Einarsen
19019 36th Ave. W.
Ste. E
Lynnwood, WA 98036

Entire Report Reviewed By:



Brian Ford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Cp: Cover Page	1	¹ Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	² Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	³ Ss
MW8-12032020 L1293415-01	5	
MW3-12032020 L1293415-02	7	⁴ Cn
EQUIP. BLANK L1293415-03	9	⁵ Sr
MW4-12042020 L1293415-04	11	
DUP L1293415-05	13	⁶ Qc
Qc: Quality Control Summary	15	
Volatile Organic Compounds (GC/MS) by Method 8260D	15	⁷ Gl
Gl: Glossary of Terms	19	⁸ Al
Al: Accreditations & Locations	20	
Sc: Sample Chain of Custody	21	⁹ Sc



MW8-12032020 L1293415-01 GW

Collected by
Jeff Tinklepaugh

Collected date/time
12/03/20 13:57

Received date/time
12/05/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1590802	1	12/13/20 11:57	12/13/20 11:57	JHH	Mt. Juliet, TN

¹ Cp² Tc³ Ss

MW3-12032020 L1293415-02 GW

Collected by
Jeff Tinklepaugh

Collected date/time
12/03/20 15:12

Received date/time
12/05/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1590802	1	12/13/20 12:16	12/13/20 12:16	JHH	Mt. Juliet, TN

⁴ Cn⁵ Sr⁶ Qc

EQUIP. BLANK L1293415-03 GW

Collected by
Jeff Tinklepaugh

Collected date/time
12/03/20 15:50

Received date/time
12/05/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1590802	1	12/13/20 10:41	12/13/20 10:41	JHH	Mt. Juliet, TN

⁷ Gl⁸ Al

MW4-12042020 L1293415-04 GW

Collected by
Jeff Tinklepaugh

Collected date/time
12/04/20 10:13

Received date/time
12/05/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1590802	1	12/13/20 12:35	12/13/20 12:35	JHH	Mt. Juliet, TN

⁹ Sc

DUP L1293415-05 GW

Collected by
Jeff Tinklepaugh

Collected date/time
12/03/20 00:00

Received date/time
12/05/20 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1590802	1	12/13/20 12:54	12/13/20 12:54	JHH	Mt. Juliet, TN



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Brian Ford
Project Manager

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	ND	C3	1.00	1	12/13/2020 11:57	WG1590802
Acrylonitrile	ND		0.500	1	12/13/2020 11:57	WG1590802
Benzene	ND		0.0400	1	12/13/2020 11:57	WG1590802
Bromobenzene	ND		0.500	1	12/13/2020 11:57	WG1590802
Bromochloromethane	ND		0.200	1	12/13/2020 11:57	WG1590802
Bromodichloromethane	ND	C3	0.100	1	12/13/2020 11:57	WG1590802
Bromoform	ND		1.00	1	12/13/2020 11:57	WG1590802
Bromomethane	ND		0.500	1	12/13/2020 11:57	WG1590802
n-Butylbenzene	ND		0.500	1	12/13/2020 11:57	WG1590802
sec-Butylbenzene	ND		0.500	1	12/13/2020 11:57	WG1590802
tert-Butylbenzene	ND		0.200	1	12/13/2020 11:57	WG1590802
Carbon disulfide	ND		0.500	1	12/13/2020 11:57	WG1590802
Carbon tetrachloride	ND	C3	0.200	1	12/13/2020 11:57	WG1590802
Chlorobenzene	ND		0.100	1	12/13/2020 11:57	WG1590802
Chlorodibromomethane	ND		0.100	1	12/13/2020 11:57	WG1590802
Chloroethane	ND		0.200	1	12/13/2020 11:57	WG1590802
Chloroform	0.138		0.100	1	12/13/2020 11:57	WG1590802
Chloromethane	ND		0.500	1	12/13/2020 11:57	WG1590802
2-Chlorotoluene	ND		0.100	1	12/13/2020 11:57	WG1590802
4-Chlorotoluene	ND		0.200	1	12/13/2020 11:57	WG1590802
1,2-Dibromo-3-Chloropropane	ND		1.00	1	12/13/2020 11:57	WG1590802
1,2-Dibromoethane	ND		0.100	1	12/13/2020 11:57	WG1590802
Dibromomethane	ND		0.200	1	12/13/2020 11:57	WG1590802
1,2-Dichlorobenzene	ND		0.200	1	12/13/2020 11:57	WG1590802
1,3-Dichlorobenzene	ND		0.200	1	12/13/2020 11:57	WG1590802
1,4-Dichlorobenzene	ND		0.200	1	12/13/2020 11:57	WG1590802
trans-1,4-Dichloro-2-butene	ND	C3	0.200	1	12/13/2020 11:57	WG1590802
Dichlorodifluoromethane	ND	C3	0.100	1	12/13/2020 11:57	WG1590802
1,1-Dichloroethane	ND		0.100	1	12/13/2020 11:57	WG1590802
1,2-Dichloroethane	ND		0.100	1	12/13/2020 11:57	WG1590802
1,1-Dichloroethene	ND		0.100	1	12/13/2020 11:57	WG1590802
cis-1,2-Dichloroethene	ND		0.100	1	12/13/2020 11:57	WG1590802
trans-1,2-Dichloroethene	ND		0.200	1	12/13/2020 11:57	WG1590802
1,2-Dichloropropane	ND		0.200	1	12/13/2020 11:57	WG1590802
1,1-Dichloropropene	ND		0.100	1	12/13/2020 11:57	WG1590802
1,3-Dichloropropane	ND		0.200	1	12/13/2020 11:57	WG1590802
cis-1,3-Dichloropropene	ND		0.100	1	12/13/2020 11:57	WG1590802
trans-1,3-Dichloropropene	ND		0.200	1	12/13/2020 11:57	WG1590802
2,2-Dichloropropane	ND	C3	0.100	1	12/13/2020 11:57	WG1590802
Di-isopropyl ether	ND		0.0400	1	12/13/2020 11:57	WG1590802
Ethylbenzene	ND		0.100	1	12/13/2020 11:57	WG1590802
Hexachloro-1,3-butadiene	ND		1.00	1	12/13/2020 11:57	WG1590802
2-Hexanone	ND		1.00	1	12/13/2020 11:57	WG1590802
n-Hexane	ND		0.200	1	12/13/2020 11:57	WG1590802
Iodomethane	ND		0.500	1	12/13/2020 11:57	WG1590802
Isopropylbenzene	ND		0.100	1	12/13/2020 11:57	WG1590802
p-Isopropyltoluene	ND		0.200	1	12/13/2020 11:57	WG1590802
2-Butanone (MEK)	ND		1.00	1	12/13/2020 11:57	WG1590802
Methylene Chloride	ND		1.00	1	12/13/2020 11:57	WG1590802
4-Methyl-2-pentanone (MIBK)	ND		1.00	1	12/13/2020 11:57	WG1590802
Methyl tert-butyl ether	ND		0.0400	1	12/13/2020 11:57	WG1590802
Naphthalene	ND	C3	0.500	1	12/13/2020 11:57	WG1590802
n-Propylbenzene	ND		0.200	1	12/13/2020 11:57	WG1590802
Styrene	ND		0.500	1	12/13/2020 11:57	WG1590802
1,1,1,2-Tetrachloroethane	ND		0.100	1	12/13/2020 11:57	WG1590802
1,1,2,2-Tetrachloroethane	ND	C3	0.100	1	12/13/2020 11:57	WG1590802

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260D

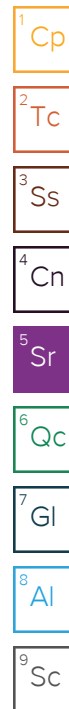
Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	ND		0.100	1	12/13/2020 11:57	WG1590802
Tetrachloroethene	6.45		0.100	1	12/13/2020 11:57	WG1590802
Toluene	ND		0.200	1	12/13/2020 11:57	WG1590802
1,2,3-Trichlorobenzene	ND		0.500	1	12/13/2020 11:57	WG1590802
1,2,4-Trichlorobenzene	ND		0.500	1	12/13/2020 11:57	WG1590802
1,1,1-Trichloroethane	ND		0.100	1	12/13/2020 11:57	WG1590802
1,1,2-Trichloroethane	ND		0.100	1	12/13/2020 11:57	WG1590802
Trichloroethene	ND		0.0400	1	12/13/2020 11:57	WG1590802
Trichlorofluoromethane	ND	C3	0.100	1	12/13/2020 11:57	WG1590802
1,2,3-Trichloropropane	ND	C3	0.500	1	12/13/2020 11:57	WG1590802
1,2,4-Trimethylbenzene	ND		0.200	1	12/13/2020 11:57	WG1590802
1,2,3-Trimethylbenzene	ND	C3	0.200	1	12/13/2020 11:57	WG1590802
1,3,5-Trimethylbenzene	ND		0.200	1	12/13/2020 11:57	WG1590802
Vinyl acetate	ND	C3	0.500	1	12/13/2020 11:57	WG1590802
Vinyl chloride	ND		0.100	1	12/13/2020 11:57	WG1590802
Xylenes, Total	ND		0.260	1	12/13/2020 11:57	WG1590802
(S) Toluene-d8	105		75.0-131		12/13/2020 11:57	WG1590802
(S) 4-Bromofluorobenzene	98.3		67.0-138		12/13/2020 11:57	WG1590802
(S) 1,2-Dichloroethane-d4	89.9		70.0-130		12/13/2020 11:57	WG1590802

1
Cp2
Tc3
Ss4
Cn5
Sr6
Qc7
Gl8
Al9
Sc



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	1.10	C3	1.00	1	12/13/2020 12:16	WG1590802
Acrylonitrile	ND		0.500	1	12/13/2020 12:16	WG1590802
Benzene	ND		0.0400	1	12/13/2020 12:16	WG1590802
Bromobenzene	ND		0.500	1	12/13/2020 12:16	WG1590802
Bromochloromethane	ND		0.200	1	12/13/2020 12:16	WG1590802
Bromodichloromethane	ND	C3	0.100	1	12/13/2020 12:16	WG1590802
Bromoform	ND		1.00	1	12/13/2020 12:16	WG1590802
Bromomethane	ND		0.500	1	12/13/2020 12:16	WG1590802
n-Butylbenzene	ND		0.500	1	12/13/2020 12:16	WG1590802
sec-Butylbenzene	ND		0.500	1	12/13/2020 12:16	WG1590802
tert-Butylbenzene	ND		0.200	1	12/13/2020 12:16	WG1590802
Carbon disulfide	ND		0.500	1	12/13/2020 12:16	WG1590802
Carbon tetrachloride	ND	C3	0.200	1	12/13/2020 12:16	WG1590802
Chlorobenzene	ND		0.100	1	12/13/2020 12:16	WG1590802
Chlorodibromomethane	ND		0.100	1	12/13/2020 12:16	WG1590802
Chloroethane	ND		0.200	1	12/13/2020 12:16	WG1590802
Chloroform	0.252		0.100	1	12/13/2020 12:16	WG1590802
Chloromethane	ND		0.500	1	12/13/2020 12:16	WG1590802
2-Chlorotoluene	ND		0.100	1	12/13/2020 12:16	WG1590802
4-Chlorotoluene	ND		0.200	1	12/13/2020 12:16	WG1590802
1,2-Dibromo-3-Chloropropane	ND		1.00	1	12/13/2020 12:16	WG1590802
1,2-Dibromoethane	ND		0.100	1	12/13/2020 12:16	WG1590802
Dibromomethane	ND		0.200	1	12/13/2020 12:16	WG1590802
1,2-Dichlorobenzene	ND		0.200	1	12/13/2020 12:16	WG1590802
1,3-Dichlorobenzene	ND		0.200	1	12/13/2020 12:16	WG1590802
1,4-Dichlorobenzene	ND		0.200	1	12/13/2020 12:16	WG1590802
trans-1,4-Dichloro-2-butene	ND	C3	0.200	1	12/13/2020 12:16	WG1590802
Dichlorodifluoromethane	ND	C3	0.100	1	12/13/2020 12:16	WG1590802
1,1-Dichloroethane	ND		0.100	1	12/13/2020 12:16	WG1590802
1,2-Dichloroethane	ND		0.100	1	12/13/2020 12:16	WG1590802
1,1-Dichloroethene	ND		0.100	1	12/13/2020 12:16	WG1590802
cis-1,2-Dichloroethene	ND		0.100	1	12/13/2020 12:16	WG1590802
trans-1,2-Dichloroethene	ND		0.200	1	12/13/2020 12:16	WG1590802
1,2-Dichloropropane	ND		0.200	1	12/13/2020 12:16	WG1590802
1,1-Dichloropropene	ND		0.100	1	12/13/2020 12:16	WG1590802
1,3-Dichloropropane	ND		0.200	1	12/13/2020 12:16	WG1590802
cis-1,3-Dichloropropene	ND		0.100	1	12/13/2020 12:16	WG1590802
trans-1,3-Dichloropropene	ND		0.200	1	12/13/2020 12:16	WG1590802
2,2-Dichloropropane	ND	C3	0.100	1	12/13/2020 12:16	WG1590802
Di-isopropyl ether	ND		0.0400	1	12/13/2020 12:16	WG1590802
Ethylbenzene	ND		0.100	1	12/13/2020 12:16	WG1590802
Hexachloro-1,3-butadiene	ND		1.00	1	12/13/2020 12:16	WG1590802
2-Hexanone	ND		1.00	1	12/13/2020 12:16	WG1590802
n-Hexane	ND		0.200	1	12/13/2020 12:16	WG1590802
Iodomethane	ND		0.500	1	12/13/2020 12:16	WG1590802
Isopropylbenzene	ND		0.100	1	12/13/2020 12:16	WG1590802
p-Isopropyltoluene	ND		0.200	1	12/13/2020 12:16	WG1590802
2-Butanone (MEK)	ND		1.00	1	12/13/2020 12:16	WG1590802
Methylene Chloride	ND		1.00	1	12/13/2020 12:16	WG1590802
4-Methyl-2-pentanone (MIBK)	ND		1.00	1	12/13/2020 12:16	WG1590802
Methyl tert-butyl ether	ND		0.0400	1	12/13/2020 12:16	WG1590802
Naphthalene	ND	C3	0.500	1	12/13/2020 12:16	WG1590802
n-Propylbenzene	ND		0.200	1	12/13/2020 12:16	WG1590802
Styrene	ND		0.500	1	12/13/2020 12:16	WG1590802
1,1,1,2-Tetrachloroethane	ND		0.100	1	12/13/2020 12:16	WG1590802
1,1,2,2-Tetrachloroethane	ND	C3	0.100	1	12/13/2020 12:16	WG1590802





Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	ND		0.100	1	12/13/2020 12:16	WG1590802
Tetrachloroethene	23.6		0.100	1	12/13/2020 12:16	WG1590802
Toluene	ND		0.200	1	12/13/2020 12:16	WG1590802
1,2,3-Trichlorobenzene	ND		0.500	1	12/13/2020 12:16	WG1590802
1,2,4-Trichlorobenzene	ND		0.500	1	12/13/2020 12:16	WG1590802
1,1,1-Trichloroethane	ND		0.100	1	12/13/2020 12:16	WG1590802
1,1,2-Trichloroethane	ND		0.100	1	12/13/2020 12:16	WG1590802
Trichloroethene	ND		0.0400	1	12/13/2020 12:16	WG1590802
Trichlorofluoromethane	ND	C3	0.100	1	12/13/2020 12:16	WG1590802
1,2,3-Trichloropropane	ND	C3	0.500	1	12/13/2020 12:16	WG1590802
1,2,4-Trimethylbenzene	ND		0.200	1	12/13/2020 12:16	WG1590802
1,2,3-Trimethylbenzene	ND	C3	0.200	1	12/13/2020 12:16	WG1590802
1,3,5-Trimethylbenzene	ND		0.200	1	12/13/2020 12:16	WG1590802
Vinyl acetate	ND	C3	0.500	1	12/13/2020 12:16	WG1590802
Vinyl chloride	ND		0.100	1	12/13/2020 12:16	WG1590802
Xylenes, Total	ND		0.260	1	12/13/2020 12:16	WG1590802
(S) Toluene-d8	104		75.0-131		12/13/2020 12:16	WG1590802
(S) 4-Bromofluorobenzene	100		67.0-138		12/13/2020 12:16	WG1590802
(S) 1,2-Dichloroethane-d4	93.1		70.0-130		12/13/2020 12:16	WG1590802

1
Cp2
Tc3
Ss4
Cn5
Sr6
Qc7
Gl8
Al9
Sc



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Acetone	1.66	C3	1.00	1	12/13/2020 10:41	WG1590802
Acrylonitrile	ND		0.500	1	12/13/2020 10:41	WG1590802
Benzene	ND		0.0400	1	12/13/2020 10:41	WG1590802
Bromobenzene	ND		0.500	1	12/13/2020 10:41	WG1590802
Bromochloromethane	ND		0.200	1	12/13/2020 10:41	WG1590802
Bromodichloromethane	ND	C3	0.100	1	12/13/2020 10:41	WG1590802
Bromoform	ND		1.00	1	12/13/2020 10:41	WG1590802
Bromomethane	ND		0.500	1	12/13/2020 10:41	WG1590802
n-Butylbenzene	ND		0.500	1	12/13/2020 10:41	WG1590802
sec-Butylbenzene	ND		0.500	1	12/13/2020 10:41	WG1590802
tert-Butylbenzene	ND		0.200	1	12/13/2020 10:41	WG1590802
Carbon disulfide	ND		0.500	1	12/13/2020 10:41	WG1590802
Carbon tetrachloride	ND	C3	0.200	1	12/13/2020 10:41	WG1590802
Chlorobenzene	ND		0.100	1	12/13/2020 10:41	WG1590802
Chlorodibromomethane	ND		0.100	1	12/13/2020 10:41	WG1590802
Chloroethane	ND		0.200	1	12/13/2020 10:41	WG1590802
Chloroform	ND		0.100	1	12/13/2020 10:41	WG1590802
Chloromethane	ND		0.500	1	12/13/2020 10:41	WG1590802
2-Chlorotoluene	ND		0.100	1	12/13/2020 10:41	WG1590802
4-Chlorotoluene	ND		0.200	1	12/13/2020 10:41	WG1590802
1,2-Dibromo-3-Chloropropane	ND		1.00	1	12/13/2020 10:41	WG1590802
1,2-Dibromoethane	ND		0.100	1	12/13/2020 10:41	WG1590802
Dibromomethane	ND		0.200	1	12/13/2020 10:41	WG1590802
1,2-Dichlorobenzene	ND		0.200	1	12/13/2020 10:41	WG1590802
1,3-Dichlorobenzene	ND		0.200	1	12/13/2020 10:41	WG1590802
1,4-Dichlorobenzene	ND		0.200	1	12/13/2020 10:41	WG1590802
trans-1,4-Dichloro-2-butene	ND	C3	0.200	1	12/13/2020 10:41	WG1590802
Dichlorodifluoromethane	ND	C3	0.100	1	12/13/2020 10:41	WG1590802
1,1-Dichloroethane	ND		0.100	1	12/13/2020 10:41	WG1590802
1,2-Dichloroethane	ND		0.100	1	12/13/2020 10:41	WG1590802
1,1-Dichloroethene	ND		0.100	1	12/13/2020 10:41	WG1590802
cis-1,2-Dichloroethene	ND		0.100	1	12/13/2020 10:41	WG1590802
trans-1,2-Dichloroethene	ND		0.200	1	12/13/2020 10:41	WG1590802
1,2-Dichloropropane	ND		0.200	1	12/13/2020 10:41	WG1590802
1,1-Dichloropropene	ND		0.100	1	12/13/2020 10:41	WG1590802
1,3-Dichloropropane	ND		0.200	1	12/13/2020 10:41	WG1590802
cis-1,3-Dichloropropene	ND		0.100	1	12/13/2020 10:41	WG1590802
trans-1,3-Dichloropropene	ND		0.200	1	12/13/2020 10:41	WG1590802
2,2-Dichloropropane	ND	C3	0.100	1	12/13/2020 10:41	WG1590802
Di-isopropyl ether	ND		0.0400	1	12/13/2020 10:41	WG1590802
Ethylbenzene	ND		0.100	1	12/13/2020 10:41	WG1590802
Hexachloro-1,3-butadiene	ND		1.00	1	12/13/2020 10:41	WG1590802
2-Hexanone	ND		1.00	1	12/13/2020 10:41	WG1590802
n-Hexane	ND		0.200	1	12/13/2020 10:41	WG1590802
Iodomethane	ND		0.500	1	12/13/2020 10:41	WG1590802
Isopropylbenzene	ND		0.100	1	12/13/2020 10:41	WG1590802
p-Isopropyltoluene	ND		0.200	1	12/13/2020 10:41	WG1590802
2-Butanone (MEK)	ND		1.00	1	12/13/2020 10:41	WG1590802
Methylene Chloride	ND		1.00	1	12/13/2020 10:41	WG1590802
4-Methyl-2-pentanone (MIBK)	ND		1.00	1	12/13/2020 10:41	WG1590802
Methyl tert-butyl ether	ND		0.0400	1	12/13/2020 10:41	WG1590802
Naphthalene	ND	C3	0.500	1	12/13/2020 10:41	WG1590802
n-Propylbenzene	ND		0.200	1	12/13/2020 10:41	WG1590802
Styrene	ND		0.500	1	12/13/2020 10:41	WG1590802
1,1,1,2-Tetrachloroethane	ND		0.100	1	12/13/2020 10:41	WG1590802
1,1,2,2-Tetrachloroethane	ND	C3	0.100	1	12/13/2020 10:41	WG1590802

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Collected date/time: 12/03/20 15:50

L1293415

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	ND		0.100	1	12/13/2020 10:41	WG1590802
Tetrachloroethene	ND		0.100	1	12/13/2020 10:41	WG1590802
Toluene	ND		0.200	1	12/13/2020 10:41	WG1590802
1,2,3-Trichlorobenzene	ND		0.500	1	12/13/2020 10:41	WG1590802
1,2,4-Trichlorobenzene	ND		0.500	1	12/13/2020 10:41	WG1590802
1,1,1-Trichloroethane	ND		0.100	1	12/13/2020 10:41	WG1590802
1,1,2-Trichloroethane	ND		0.100	1	12/13/2020 10:41	WG1590802
Trichloroethene	ND		0.0400	1	12/13/2020 10:41	WG1590802
Trichlorofluoromethane	ND	C3	0.100	1	12/13/2020 10:41	WG1590802
1,2,3-Trichloropropane	ND	C3	0.500	1	12/13/2020 10:41	WG1590802
1,2,4-Trimethylbenzene	ND		0.200	1	12/13/2020 10:41	WG1590802
1,2,3-Trimethylbenzene	ND	C3	0.200	1	12/13/2020 10:41	WG1590802
1,3,5-Trimethylbenzene	ND		0.200	1	12/13/2020 10:41	WG1590802
Vinyl acetate	ND	C3	0.500	1	12/13/2020 10:41	WG1590802
Vinyl chloride	ND		0.100	1	12/13/2020 10:41	WG1590802
Xylenes, Total	ND		0.260	1	12/13/2020 10:41	WG1590802
(S) Toluene-d8	104		75.0-131		12/13/2020 10:41	WG1590802
(S) 4-Bromofluorobenzene	98.3		67.0-138		12/13/2020 10:41	WG1590802
(S) 1,2-Dichloroethane-d4	87.9		70.0-130		12/13/2020 10:41	WG1590802

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	2.01	C3	1.00	1	12/13/2020 12:35	WG1590802	¹ Cp
Acrylonitrile	ND		0.500	1	12/13/2020 12:35	WG1590802	² Tc
Benzene	ND		0.0400	1	12/13/2020 12:35	WG1590802	³ Ss
Bromobenzene	ND		0.500	1	12/13/2020 12:35	WG1590802	⁴ Cn
Bromochloromethane	ND		0.200	1	12/13/2020 12:35	WG1590802	⁵ Sr
Bromodichloromethane	ND	C3	0.100	1	12/13/2020 12:35	WG1590802	⁶ Qc
Bromoform	ND		1.00	1	12/13/2020 12:35	WG1590802	⁷ Gl
Bromomethane	ND		0.500	1	12/13/2020 12:35	WG1590802	⁸ Al
n-Butylbenzene	ND		0.500	1	12/13/2020 12:35	WG1590802	⁹ Sc
sec-Butylbenzene	ND		0.500	1	12/13/2020 12:35	WG1590802	
tert-Butylbenzene	ND		0.200	1	12/13/2020 12:35	WG1590802	
Carbon disulfide	ND		0.500	1	12/13/2020 12:35	WG1590802	
Carbon tetrachloride	ND	C3	0.200	1	12/13/2020 12:35	WG1590802	
Chlorobenzene	ND		0.100	1	12/13/2020 12:35	WG1590802	
Chlorodibromomethane	ND		0.100	1	12/13/2020 12:35	WG1590802	
Chloroethane	ND		0.200	1	12/13/2020 12:35	WG1590802	
Chloroform	ND		0.100	1	12/13/2020 12:35	WG1590802	
Chloromethane	ND		0.500	1	12/13/2020 12:35	WG1590802	
2-Chlorotoluene	ND		0.100	1	12/13/2020 12:35	WG1590802	
4-Chlorotoluene	ND		0.200	1	12/13/2020 12:35	WG1590802	
1,2-Dibromo-3-Chloropropane	ND		1.00	1	12/13/2020 12:35	WG1590802	
1,2-Dibromoethane	ND		0.100	1	12/13/2020 12:35	WG1590802	
Dibromomethane	ND		0.200	1	12/13/2020 12:35	WG1590802	
1,2-Dichlorobenzene	ND		0.200	1	12/13/2020 12:35	WG1590802	
1,3-Dichlorobenzene	ND		0.200	1	12/13/2020 12:35	WG1590802	
1,4-Dichlorobenzene	ND		0.200	1	12/13/2020 12:35	WG1590802	
trans-1,4-Dichloro-2-butene	ND	C3	0.200	1	12/13/2020 12:35	WG1590802	
Dichlorodifluoromethane	ND	C3	0.100	1	12/13/2020 12:35	WG1590802	
1,1-Dichloroethane	ND		0.100	1	12/13/2020 12:35	WG1590802	
1,2-Dichloroethane	ND		0.100	1	12/13/2020 12:35	WG1590802	
1,1-Dichloroethene	ND		0.100	1	12/13/2020 12:35	WG1590802	
cis-1,2-Dichloroethene	ND		0.100	1	12/13/2020 12:35	WG1590802	
trans-1,2-Dichloroethene	ND		0.200	1	12/13/2020 12:35	WG1590802	
1,2-Dichloropropane	ND		0.200	1	12/13/2020 12:35	WG1590802	
1,1-Dichloropropene	ND		0.100	1	12/13/2020 12:35	WG1590802	
1,3-Dichloropropane	ND		0.200	1	12/13/2020 12:35	WG1590802	
cis-1,3-Dichloropropene	ND		0.100	1	12/13/2020 12:35	WG1590802	
trans-1,3-Dichloropropene	ND		0.200	1	12/13/2020 12:35	WG1590802	
2,2-Dichloropropane	ND	C3	0.100	1	12/13/2020 12:35	WG1590802	
Di-isopropyl ether	ND		0.0400	1	12/13/2020 12:35	WG1590802	
Ethylbenzene	ND		0.100	1	12/13/2020 12:35	WG1590802	
Hexachloro-1,3-butadiene	ND		1.00	1	12/13/2020 12:35	WG1590802	
2-Hexanone	ND		1.00	1	12/13/2020 12:35	WG1590802	
n-Hexane	ND		0.200	1	12/13/2020 12:35	WG1590802	
Iodomethane	ND		0.500	1	12/13/2020 12:35	WG1590802	
Isopropylbenzene	ND		0.100	1	12/13/2020 12:35	WG1590802	
p-Isopropyltoluene	ND		0.200	1	12/13/2020 12:35	WG1590802	
2-Butanone (MEK)	ND		1.00	1	12/13/2020 12:35	WG1590802	
Methylene Chloride	ND		1.00	1	12/13/2020 12:35	WG1590802	
4-Methyl-2-pentanone (MIBK)	ND		1.00	1	12/13/2020 12:35	WG1590802	
Methyl tert-butyl ether	ND		0.0400	1	12/13/2020 12:35	WG1590802	
Naphthalene	ND	C3	0.500	1	12/13/2020 12:35	WG1590802	
n-Propylbenzene	ND		0.200	1	12/13/2020 12:35	WG1590802	
Styrene	ND		0.500	1	12/13/2020 12:35	WG1590802	
1,1,1,2-Tetrachloroethane	ND		0.100	1	12/13/2020 12:35	WG1590802	
1,1,2,2-Tetrachloroethane	ND	C3	0.100	1	12/13/2020 12:35	WG1590802	



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	ND		0.100	1	12/13/2020 12:35	WG1590802
Tetrachloroethene	18.6		0.100	1	12/13/2020 12:35	WG1590802
Toluene	ND		0.200	1	12/13/2020 12:35	WG1590802
1,2,3-Trichlorobenzene	ND		0.500	1	12/13/2020 12:35	WG1590802
1,2,4-Trichlorobenzene	ND		0.500	1	12/13/2020 12:35	WG1590802
1,1,1-Trichloroethane	ND		0.100	1	12/13/2020 12:35	WG1590802
1,1,2-Trichloroethane	ND		0.100	1	12/13/2020 12:35	WG1590802
Trichloroethene	ND		0.0400	1	12/13/2020 12:35	WG1590802
Trichlorofluoromethane	ND	C3	0.100	1	12/13/2020 12:35	WG1590802
1,2,3-Trichloropropane	ND	C3	0.500	1	12/13/2020 12:35	WG1590802
1,2,4-Trimethylbenzene	ND		0.200	1	12/13/2020 12:35	WG1590802
1,2,3-Trimethylbenzene	ND	C3	0.200	1	12/13/2020 12:35	WG1590802
1,3,5-Trimethylbenzene	ND		0.200	1	12/13/2020 12:35	WG1590802
Vinyl acetate	ND	C3	0.500	1	12/13/2020 12:35	WG1590802
Vinyl chloride	ND		0.100	1	12/13/2020 12:35	WG1590802
Xylenes, Total	ND		0.260	1	12/13/2020 12:35	WG1590802
(S) Toluene-d8	102		75.0-131		12/13/2020 12:35	WG1590802
(S) 4-Bromofluorobenzene	99.9		67.0-138		12/13/2020 12:35	WG1590802
(S) 1,2-Dichloroethane-d4	95.6		70.0-130		12/13/2020 12:35	WG1590802

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc



Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch	
Acetone	2.38	C3	1.00	1	12/13/2020 12:54	WG1590802	¹ Cp
Acrylonitrile	ND		0.500	1	12/13/2020 12:54	WG1590802	² Tc
Benzene	ND		0.0400	1	12/13/2020 12:54	WG1590802	³ Ss
Bromobenzene	ND		0.500	1	12/13/2020 12:54	WG1590802	⁴ Cn
Bromochloromethane	ND		0.200	1	12/13/2020 12:54	WG1590802	⁵ Sr
Bromodichloromethane	ND	C3	0.100	1	12/13/2020 12:54	WG1590802	⁶ Qc
Bromoform	ND		1.00	1	12/13/2020 12:54	WG1590802	⁷ Gl
Bromomethane	ND		0.500	1	12/13/2020 12:54	WG1590802	⁸ Al
n-Butylbenzene	ND		0.500	1	12/13/2020 12:54	WG1590802	⁹ Sc
sec-Butylbenzene	ND		0.500	1	12/13/2020 12:54	WG1590802	
tert-Butylbenzene	ND		0.200	1	12/13/2020 12:54	WG1590802	
Carbon disulfide	ND		0.500	1	12/13/2020 12:54	WG1590802	
Carbon tetrachloride	ND	C3	0.200	1	12/13/2020 12:54	WG1590802	
Chlorobenzene	ND		0.100	1	12/13/2020 12:54	WG1590802	
Chlorodibromomethane	ND		0.100	1	12/13/2020 12:54	WG1590802	
Chloroethane	ND		0.200	1	12/13/2020 12:54	WG1590802	
Chloroform	ND		0.100	1	12/13/2020 12:54	WG1590802	
Chloromethane	ND		0.500	1	12/13/2020 12:54	WG1590802	
2-Chlorotoluene	ND		0.100	1	12/13/2020 12:54	WG1590802	
4-Chlorotoluene	ND		0.200	1	12/13/2020 12:54	WG1590802	
1,2-Dibromo-3-Chloropropane	ND		1.00	1	12/13/2020 12:54	WG1590802	
1,2-Dibromoethane	ND		0.100	1	12/13/2020 12:54	WG1590802	
Dibromomethane	ND		0.200	1	12/13/2020 12:54	WG1590802	
1,2-Dichlorobenzene	ND		0.200	1	12/13/2020 12:54	WG1590802	
1,3-Dichlorobenzene	ND		0.200	1	12/13/2020 12:54	WG1590802	
1,4-Dichlorobenzene	ND		0.200	1	12/13/2020 12:54	WG1590802	
trans-1,4-Dichloro-2-butene	ND	C3	0.200	1	12/13/2020 12:54	WG1590802	
Dichlorodifluoromethane	ND	C3	0.100	1	12/13/2020 12:54	WG1590802	
1,1-Dichloroethane	ND		0.100	1	12/13/2020 12:54	WG1590802	
1,2-Dichloroethane	ND		0.100	1	12/13/2020 12:54	WG1590802	
1,1-Dichloroethene	ND		0.100	1	12/13/2020 12:54	WG1590802	
cis-1,2-Dichloroethene	ND		0.100	1	12/13/2020 12:54	WG1590802	
trans-1,2-Dichloroethene	ND		0.200	1	12/13/2020 12:54	WG1590802	
1,2-Dichloropropane	ND		0.200	1	12/13/2020 12:54	WG1590802	
1,1-Dichloropropene	ND		0.100	1	12/13/2020 12:54	WG1590802	
1,3-Dichloropropane	ND		0.200	1	12/13/2020 12:54	WG1590802	
cis-1,3-Dichloropropene	ND		0.100	1	12/13/2020 12:54	WG1590802	
trans-1,3-Dichloropropene	ND		0.200	1	12/13/2020 12:54	WG1590802	
2,2-Dichloropropane	ND	C3	0.100	1	12/13/2020 12:54	WG1590802	
Di-isopropyl ether	ND		0.0400	1	12/13/2020 12:54	WG1590802	
Ethylbenzene	ND		0.100	1	12/13/2020 12:54	WG1590802	
Hexachloro-1,3-butadiene	ND		1.00	1	12/13/2020 12:54	WG1590802	
2-Hexanone	ND		1.00	1	12/13/2020 12:54	WG1590802	
n-Hexane	ND		0.200	1	12/13/2020 12:54	WG1590802	
Iodomethane	ND		0.500	1	12/13/2020 12:54	WG1590802	
Isopropylbenzene	ND		0.100	1	12/13/2020 12:54	WG1590802	
p-Isopropyltoluene	ND		0.200	1	12/13/2020 12:54	WG1590802	
2-Butanone (MEK)	ND		1.00	1	12/13/2020 12:54	WG1590802	
Methylene Chloride	ND		1.00	1	12/13/2020 12:54	WG1590802	
4-Methyl-2-pentanone (MIBK)	ND		1.00	1	12/13/2020 12:54	WG1590802	
Methyl tert-butyl ether	ND		0.0400	1	12/13/2020 12:54	WG1590802	
Naphthalene	ND	C3	0.500	1	12/13/2020 12:54	WG1590802	
n-Propylbenzene	ND		0.200	1	12/13/2020 12:54	WG1590802	
Styrene	ND		0.500	1	12/13/2020 12:54	WG1590802	
1,1,1,2-Tetrachloroethane	ND		0.100	1	12/13/2020 12:54	WG1590802	
1,1,2,2-Tetrachloroethane	ND	C3	0.100	1	12/13/2020 12:54	WG1590802	



Collected date/time: 12/03/20 00:00

L1293415

Volatile Organic Compounds (GC/MS) by Method 8260D

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
1,1,2-Trichlorotrifluoroethane	ND		0.100	1	12/13/2020 12:54	WG1590802
Tetrachloroethene	17.3		0.100	1	12/13/2020 12:54	WG1590802
Toluene	ND		0.200	1	12/13/2020 12:54	WG1590802
1,2,3-Trichlorobenzene	ND		0.500	1	12/13/2020 12:54	WG1590802
1,2,4-Trichlorobenzene	ND		0.500	1	12/13/2020 12:54	WG1590802
1,1,1-Trichloroethane	ND		0.100	1	12/13/2020 12:54	WG1590802
1,1,2-Trichloroethane	ND		0.100	1	12/13/2020 12:54	WG1590802
Trichloroethene	ND		0.0400	1	12/13/2020 12:54	WG1590802
Trichlorofluoromethane	ND	C3	0.100	1	12/13/2020 12:54	WG1590802
1,2,3-Trichloropropane	ND	C3	0.500	1	12/13/2020 12:54	WG1590802
1,2,4-Trimethylbenzene	ND		0.200	1	12/13/2020 12:54	WG1590802
1,2,3-Trimethylbenzene	ND	C3	0.200	1	12/13/2020 12:54	WG1590802
1,3,5-Trimethylbenzene	ND		0.200	1	12/13/2020 12:54	WG1590802
Vinyl acetate	ND	C3	0.500	1	12/13/2020 12:54	WG1590802
Vinyl chloride	ND		0.100	1	12/13/2020 12:54	WG1590802
Xylenes, Total	ND		0.260	1	12/13/2020 12:54	WG1590802
(S) Toluene-d8	105		75.0-131		12/13/2020 12:54	WG1590802
(S) 4-Bromofluorobenzene	102		67.0-138		12/13/2020 12:54	WG1590802
(S) 1,2-Dichloroethane-d4	96.6		70.0-130		12/13/2020 12:54	WG1590802

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3602954-2 12/13/20 09:06

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Acetone	U		0.548	1.00
Acrylonitrile	U		0.0760	0.500
Benzene	U		0.0160	0.0400
Bromobenzene	U		0.0420	0.500
Bromodichloromethane	U		0.0315	0.100
Bromochloromethane	U		0.0452	0.200
Bromoform	U		0.239	1.00
Bromomethane	U		0.148	0.500
n-Butylbenzene	U		0.153	0.500
sec-Butylbenzene	U		0.101	0.500
tert-Butylbenzene	U		0.0620	0.200
Carbon disulfide	U		0.162	0.500
Carbon tetrachloride	U		0.0432	0.200
Chlorobenzene	U		0.0229	0.100
Chlorodibromomethane	U		0.0180	0.100
Chloroethane	U		0.0432	0.200
Chloroform	U		0.0166	0.100
Chloromethane	U		0.0556	0.500
2-Chlorotoluene	U		0.0368	0.100
4-Chlorotoluene	U		0.0452	0.200
1,2-Dibromo-3-Chloropropane	U		0.204	1.00
1,2-Dibromoethane	U		0.0210	0.100
Dibromomethane	U		0.0400	0.200
1,2-Dichlorobenzene	U		0.0580	0.200
1,3-Dichlorobenzene	U		0.0680	0.200
1,4-Dichlorobenzene	U		0.0788	0.200
trans-1,4-Dichloro-2-butene	U		0.0560	0.200
Dichlorodifluoromethane	U		0.0327	0.100
1,1-Dichloroethane	U		0.0230	0.100
1,2-Dichloroethane	U		0.0190	0.100
1,1-Dichloroethene	U		0.0200	0.100
cis-1,2-Dichloroethene	U		0.0276	0.100
trans-1,2-Dichloroethene	U		0.0572	0.200
1,2-Dichloropropane	U		0.0508	0.200
1,1-Dichloropropene	U		0.0280	0.100
1,3-Dichloropropane	U		0.0700	0.200
cis-1,3-Dichloropropene	U		0.0271	0.100
trans-1,3-Dichloropropene	U		0.0612	0.200
2,2-Dichloropropane	U		0.0317	0.100
Di-isopropyl ether	U		0.0140	0.0400

1

Cp

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Tc

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Ss

4

Cn

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Sr

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Qc

7

Gl

8

Al

9

Sc

Method Blank (MB)

(MB) R3602954-2 12/13/20 09:06

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Ethylbenzene	U		0.0212	0.100
Hexachloro-1,3-butadiene	U		0.508	1.00
n-Hexane	U		0.0424	0.200
2-Hexanone	U		0.400	1.00
Iodomethane	U		0.242	0.500
Isopropylbenzene	U		0.0345	0.100
p-Isopropyltoluene	U		0.0932	0.200
2-Butanone (MEK)	U		0.500	1.00
Methylene Chloride	U		0.265	1.00
4-Methyl-2-pentanone (MIBK)	U		0.400	1.00
Methyl tert-butyl ether	U		0.0118	0.0400
Naphthalene	U		0.124	0.500
n-Propylbenzene	U		0.0472	0.200
Styrene	U		0.109	0.500
1,1,1,2-Tetrachloroethane	U		0.0200	0.100
1,1,2,2-Tetrachloroethane	U		0.0156	0.100
Tetrachloroethene	U		0.0280	0.100
Toluene	U		0.0500	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0270	0.100
1,2,3-Trichlorobenzene	U		0.0250	0.500
1,2,4-Trichlorobenzene	U		0.193	0.500
1,1,1-Trichloroethane	U		0.0110	0.100
1,1,2-Trichloroethane	U		0.0353	0.100
Trichloroethene	U		0.0160	0.0400
Trichlorofluoromethane	U		0.0200	0.100
1,2,3-Trichloropropane	U		0.204	0.500
1,2,3-Trimethylbenzene	U		0.0460	0.200
1,2,4-Trimethylbenzene	U		0.0464	0.200
1,3,5-Trimethylbenzene	U		0.0432	0.200
Vinyl acetate	U		0.141	0.500
Vinyl chloride	U		0.0273	0.100
Xylenes, Total	U		0.191	0.260
(S) Toluene-d8	105			75.0-131
(S) 4-Bromofluorobenzene	97.5			67.0-138
(S) 1,2-Dichloroethane-d4	90.9			70.0-130

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

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Al

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Sc



Laboratory Control Sample (LCS)

(LCS) R3602954-1 12/13/20 07:49

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Acetone	25.0	19.7	78.8	10.0-160	
Acrylonitrile	25.0	22.8	91.2	45.0-153	
Benzene	5.00	4.33	86.6	70.0-123	
Bromobenzene	5.00	4.67	93.4	73.0-121	
Bromodichloromethane	5.00	3.93	78.6	73.0-121	
Bromochloromethane	5.00	4.90	98.0	77.0-128	
Bromoform	5.00	4.65	93.0	64.0-132	
Bromomethane	5.00	4.05	81.0	56.0-147	
n-Butylbenzene	5.00	4.18	83.6	68.0-135	
sec-Butylbenzene	5.00	4.49	89.8	74.0-130	
tert-Butylbenzene	5.00	4.61	92.2	75.0-127	
Carbon disulfide	5.00	4.65	93.0	56.0-133	
Carbon tetrachloride	5.00	3.73	74.6	66.0-128	
Chlorobenzene	5.00	4.88	97.6	76.0-128	
Chlorodibromomethane	5.00	4.43	88.6	74.0-127	
Chloroethane	5.00	4.37	87.4	61.0-134	
Chloroform	5.00	4.08	81.6	72.0-123	
Chloromethane	5.00	4.96	99.2	51.0-138	
2-Chlorotoluene	5.00	4.04	80.8	75.0-124	
4-Chlorotoluene	5.00	4.26	85.2	75.0-124	
1,2-Dibromo-3-Chloropropane	5.00	4.18	83.6	59.0-130	
1,2-Dibromoethane	5.00	4.39	87.8	74.0-128	
Dibromomethane	5.00	4.21	84.2	75.0-122	
1,2-Dichlorobenzene	5.00	4.16	83.2	76.0-124	
1,3-Dichlorobenzene	5.00	4.52	90.4	76.0-125	
1,4-Dichlorobenzene	5.00	4.59	91.8	77.0-121	
trans-1,4-Dichloro-2-butene	5.00	3.27	65.4	45.0-143	
Dichlorodifluoromethane	5.00	3.64	72.8	43.0-156	
1,1-Dichloroethane	5.00	4.42	88.4	70.0-127	
1,2-Dichloroethane	5.00	4.04	80.8	65.0-131	
1,1-Dichloroethene	5.00	4.86	97.2	65.0-131	
cis-1,2-Dichloroethene	5.00	4.52	90.4	73.0-125	
trans-1,2-Dichloroethene	5.00	4.57	91.4	71.0-125	
1,2-Dichloropropane	5.00	4.72	94.4	74.0-125	
1,1-Dichloropropene	5.00	4.67	93.4	73.0-125	
1,3-Dichloropropane	5.00	4.27	85.4	80.0-125	
cis-1,3-Dichloropropene	5.00	4.47	89.4	76.0-127	
trans-1,3-Dichloropropene	5.00	4.13	82.6	73.0-127	
2,2-Dichloropropane	5.00	3.82	76.4	59.0-135	
Di-isopropyl ether	5.00	4.67	93.4	60.0-136	

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc



Laboratory Control Sample (LCS)

(LCS) R3602954-1 12/13/20 07:49

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Ethylbenzene	5.00	4.77	95.4	74.0-126	
Hexachloro-1,3-butadiene	5.00	5.81	116	57.0-150	
n-Hexane	5.00	4.08	81.6	55.0-137	
2-Hexanone	25.0	24.3	97.2	54.0-147	
Iodomethane	25.0	23.1	92.4	74.0-134	
Isopropylbenzene	5.00	4.83	96.6	72.0-127	
p-Isopropyltoluene	5.00	4.33	86.6	72.0-133	
2-Butanone (MEK)	25.0	22.9	91.6	30.0-160	
Methylene Chloride	5.00	4.29	85.8	68.0-123	
4-Methyl-2-pentanone (MIBK)	25.0	24.0	96.0	56.0-143	
Methyl tert-butyl ether	5.00	4.11	82.2	66.0-132	
Naphthalene	5.00	3.89	77.8	59.0-130	
n-Propylbenzene	5.00	4.41	88.2	74.0-126	
Styrene	5.00	4.72	94.4	72.0-127	
1,1,1,2-Tetrachloroethane	5.00	4.47	89.4	74.0-129	
1,1,2,2-Tetrachloroethane	5.00	3.48	69.6	68.0-128	
Tetrachloroethene	5.00	5.85	117	70.0-136	
Toluene	5.00	4.78	95.6	75.0-121	
1,1,2-Trichlorotrifluoroethane	5.00	4.02	80.4	61.0-139	
1,2,3-Trichlorobenzene	5.00	4.31	86.2	59.0-139	
1,2,4-Trichlorobenzene	5.00	4.34	86.8	62.0-137	
1,1,1-Trichloroethane	5.00	4.08	81.6	69.0-126	
1,1,2-Trichloroethane	5.00	4.56	91.2	78.0-123	
Trichloroethene	5.00	5.34	107	76.0-126	
Trichlorofluoromethane	5.00	3.87	77.4	61.0-142	
1,2,3-Trichloropropane	5.00	3.95	79.0	67.0-129	
1,2,3-Trimethylbenzene	5.00	3.96	79.2	74.0-124	
1,2,4-Trimethylbenzene	5.00	4.26	85.2	70.0-126	
1,3,5-Trimethylbenzene	5.00	4.44	88.8	73.0-127	
Vinyl acetate	25.0	14.7	58.8	43.0-159	
Vinyl chloride	5.00	4.43	88.6	63.0-134	
Xylenes, Total	15.0	14.5	96.7	72.0-127	
(S) Toluene-d8			104	75.0-131	
(S) 4-Bromofluorobenzene			99.1	67.0-138	
(S) 1,2-Dichloroethane-d4			86.6	70.0-130	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

C3	The reported concentration is an estimate. The continuing calibration standard associated with this data responded low. Method sensitivity check is acceptable.
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1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

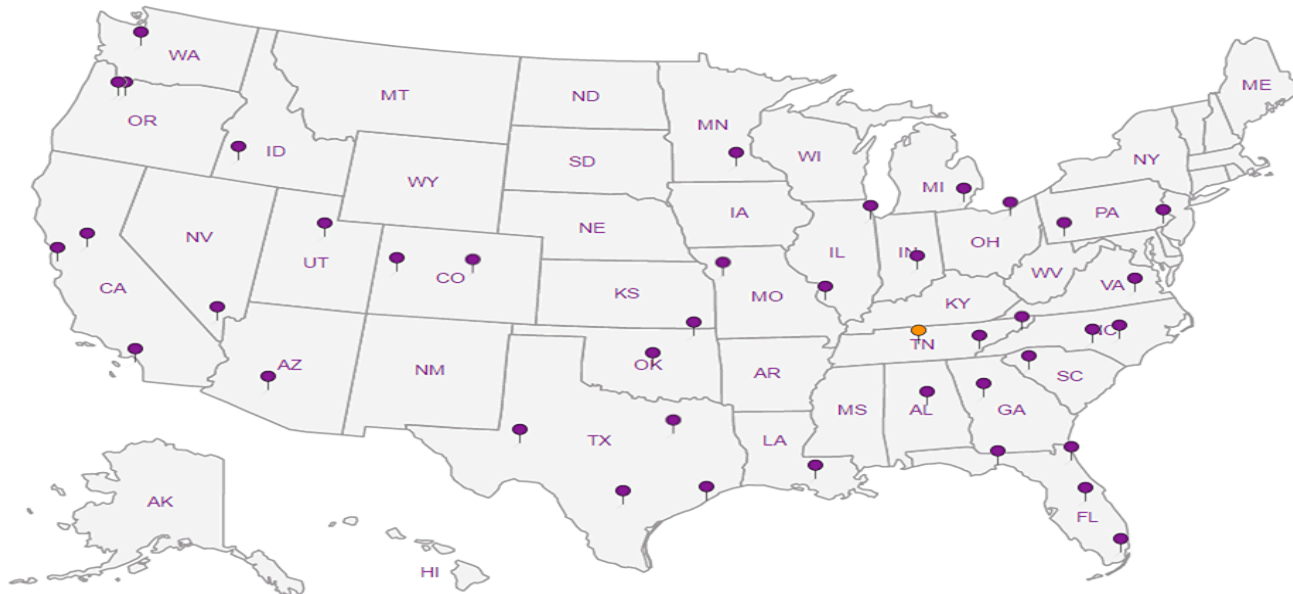
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



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