

Remedial Investigation Addendum

Site Name: **Adams Street Building**
Site Address: **6707-6709 S Adams Street**
Tacoma, Washington 98409

Alternate
Location Info: NA

Ecology Facility Site ID No.: **7177**
Voluntary Cleanup Program Project No.: **SW1530**
Order No.: NA
Consent Decree No.: NA

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Signature: 

Date: 01/29/20

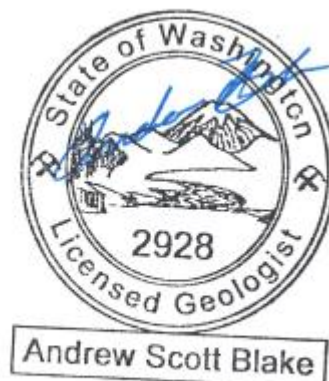




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ACRONYMS AND ABBREVIATIONS

ARAR	Applicable or Relevant and Appropriate Requirements
AEG	Associated Environmental Group, LLC
BGS	below ground surface
COC	Contaminant/Chemical of Concern
COPC	Contaminant/Chemical of Potential Concern
CSID	Cleanup Site Identification number
CSM	Conceptual Site Model
CUL	clean-up levels
Ecology	Washington State Department of Ecology
EPA	Environmental Protection Agency
FOC	Fraction of Organic Carbon
FSID	Facility Site identification number
HVOC	Halogenated Volatile Organic Compound
IDW	Investigation-Derived Waste
IRAM	Interim Remedial Action Measure
MTCA	Model Toxics Control Act
PCE	tetrachloroethylene
PID	Photoionization detector
PSD	particle size distribution
QAPP	Quality Assurance Project Plan
RCW	Revised Code of Washington
SAP	Sampling and Analysis Plan
SEC	Succeed Environmental Consulting LLC
TCE	trichloroethylene
TEE	Terrestrial Ecological Evaluation
TPH	total petroleum hydrocarbon
VCP	Voluntary Cleanup Program
VOC	Volatile Organic Compound
WAC	Washington State Administrative Code



EXECUTIVE SUMMARY

In October 2018, a Remedial Investigation Report was prepared for the Adams Street Building site located at 6707-6709 S Adams Street in Tacoma, Washington. A formal wear business historically occupied the site (circa 1999-2015). During that time, two closed-loop dry-cleaning machines and associated small-quantity materials were historically located on the project site. Between 2016 and 2018, the magnitude and extent of PCE impact was studied and a CSM was developed in accordance with MTCA. Based on the findings of the RI, the following was concluded:

- PCE is the only COPC at the project site.
- Since none of the compounds identified at the project site are listed as priority contaminants of ecological concern (listed in WAC-173-340-900; Table 749-2), no further terrestrial ecological evaluation was warranted.
- Groundwater conditions at the project site met corresponding cleanup standards and are considered protective of human health and the environment.
- The residual presence of PCE in soil met corresponding site-specific cleanup standards and is considered protective of human health and the environment.
- Indoor or ambient at the project site met corresponding cleanup standards and is considered protective of human health and the environment.
- No field evidence of chemical impact was observed by SEC during exploration activities conducted at the project site.

Although the residual presence of PCE in soil met corresponding site-specific cleanup standards, the concentrations of PCE in soil still slightly (by less than 1 part per million) exceeded the MTCA Method A CUL in two areas of the site. Accordingly, the project team opted to further remediate PCE in soil to concentrations below the MTCA Method A CUL as follows:

- SEC operated up to three 4-inch-diameter PVC vents equipped with an in-line fans to increase the flow of air from the vadose zone beneath the project site structure.
- SEC installed a series of heated air injection points at the project site and connected to up to five blowers capable of heating air to temperatures of up to 131° Fahrenheit with velocities of up to 70 meters/second to each temporary injection point. The blowers were also connected to monitoring wells MW-3 and MW-4. The blowers were used to push hot air into the subsurface between July 2019 and September 2019.

Investigation activities were conducted by SEC on February 21, 2019 (before the application of heated air into the vadose zone) and on November 20, 2019 (following the application of heated air). The purpose of our exploration was to analyze soil at the locations that previously exhibited the highest concentrations of PCE at the project site (specifically MW-3 and MW-4).

Following the implementation of IRAMs discussed herein, PCE (and all other VOCs) were either not detected at concentrations greater than laboratory reported detection limits (RDLs) or were detected at concentrations less than the MTCA Method A CUL. Based on the foregoing, it is our professional opinion that soil at the project site is protective of human health and the environment.

After Ecology has completed its review of this report, we respectfully request an opinion on the completed actions. In our professional opinion, the data presented in this report may warrant an opinion of "No Further Action" for the project site.



1. INTRODUCTION

The objective of this report is to supplement the Remedial Investigation (RI) report dated October 31, 2018 with a description of additional interim remedial action measures (IRAMS) and the results of subsequent soil sampling activities conducted at 6707-6709 S Adams Street site in Tacoma, Washington (project site). The project site is shown relative to surrounding physical features on Figure 1 and is described in the following sections.

1.1. GENERAL SITE INFORMATION

Site Name	Adams Street Building
Site Address	6707-6709 S Adams Street, Tacoma, WA 98409
Facility/Site I.D.	7177
Cleanup Site I.D.	13051
VCP Site I.D.	SW1530
Project Consultant	Andrew Blake Succeed Environmental Consulting LLC 6028 NE 49 th Avenue, Portland, OR 97218 ablake@succeed-env.com (971) 371-0404
Customer Contact	Ed Honeycutt 16113 NW 27 th Court, Vancouver, WA 98685 edhoneycutt@mrformalinc.com (503) 939-7519
Property Owner Contact	Stephen Nielsen 7216 Lakewood Drive W, Lakewood, WA 98499 holroydsn@aol.com (253) 279-1686
Lat/Long (decimal degrees)	47.196 / -122.486

The 1.29-acre project site includes Pierce County tax parcels 0220251164 and 0220251163, which are located in Section 25, Township 20 North, Range 2 East of the Willamette Meridian. The project site is situated in an industrial area of Tacoma, and the site structure consists of a single-level industrial warehouse with an attached two-level office area.

One sanitary sewer line is located beneath the northeastern portion of the project site and was connected the project site restrooms and a former commercial washing machine drain (that discharged only water and biodegradable soap) to a sewer conveyance line located north of the project site structure. The commercial washing machine connection has since been removed. Surface water that accumulates at the project site is generally expected to infiltrate the ground surface or flow across the roof of the project site structure and across paved surfaces towards catch basins located to the west of the project site structure.

2. FIELD INVESTIGATIONS, IRAMS, AND SUBSEQUENT SITE CHARACTERIZATION

2.1. INTERIM REMEDIAL ACTION MEASURES

Between November 2017 and February 2018, SEC drilled two 4-inch-diameter holes through the concrete floor slab (near the former dry-cleaning machines) and placed 4-inch-diameter PVC vent pipes

equipped with an in-line fans in each hole. The base of the vent pipe was grouted in-place, the vent pipe was extended through the roof of the project site structure, and the in-line fans (Fan-1 and Fan-2) were activated. In July 2019, a third in-line fan (Fan-3) was similarly constructed near the western exterior of the project site structure. All three fans have remained operational since that time. Photographs of the fans are provided below. The approximate fan locations are shown on Figures 2 and 3.



Fan-1



Fan-2



Fan-3

On July 30, 2019, Pacific Soil and Water of Tigard, Oregon installed seven heated air injection points at the project site. Each point was constructed as follows:

- A direct-push drill rig was used to advance a 3-inch-diameter macro-core soil sampler to depths ranging between 10 and 15 feet BGS.
- Each boring was backfilled with coarse silica sand and a slotted PVC pipe was installed at each location from a depth of approximately 1.0 to 6.0 feet BGS.
- The upper-most foot at each location was sealed with hydrated bentonite.

Following installation of each temporary air injection point, SEC used 1-inch-diameter hoses to connect five CHAOLUN™ 2,400 watt/3.2 horsepower blowers capable of heating air to temperatures of up to 131° Fahrenheit with velocities of up to 70 meters/second to each point and to monitoring wells MW-3 and MW-4. The blowers were used to push hot air into the subsurface between approximately July 16 and September 5, 2019.

**PVC Point Installation.****Heated Air Connected to PVC Points and MW-4.**

2.2. SITE CHARACTERIZATION

2.2.1. SAMPLING AND MONITORING

Investigation activities were conducted by SEC on February 21, 2019 (before the application of heated air into the vadose zone) and on November 20, 2019 (following the application of heated air). The purpose of our exploration was to analyze soil at the locations that previously exhibited the highest concentrations of PCE at the project site (specifically MW-3 and MW-4).

The sampling equipment used for the collection of samples was decontaminated prior to use, when appropriate. Decontamination was performed on all sample re-usable processing equipment that came into contact with sampling media. Decontamination was performed prior to sampling each location using the following procedures:

1. Rinsed with tap water and scrubbed with a scrub brush until free of large particles
2. Washed with phosphate-free (Alconox™) detergent solution
3. Rinsed with tap water

All investigation-derived waste (IDW) generated during investigation activities was placed in 55-gallon drums on-site pending disposal. SEC intends to subcontract a licensed waste disposal service to dispose of all IDW generated at the project site. All associated disposal documentation will be provided to Ecology.

2.2.1.1. SOIL SCREENING AND SAMPLING

Soil exploration activities were conducted by SEC between February and November 2019 included the advancement of direct-push borings proximate to (within approximately 2 feet of) MW-3 and

MW-4. SEC subcontracted ESN Northwest of Olympia, Washington, to advance the direct-push borings to a depth of approximately 15.0 feet BGS. SEC obtained soil samples for analysis. The approximate exploration locations are shown on Figures 2 and 3.

Soil samples obtained from the direct-push explorations were collected from approximately 2-inch-diameter, 60-inch-long samplers lined with acrylic sleeves. Soil conditions observed by SEC were consistent with the conditions that are reported in the MW-3 and MW-4 boring logs (refer to the 2018 RI report). As previously noted, no field evidence of chemical impact (odor, sheen, or elevated headspace vapor) was observed by SEC during exploration activities conducted at the project site.

Soil samples selected for analysis were collected from depths ranging between 5.0 and 15.0 feet BGS (where PCE concentrations previously exceeded the MTCA Method A CUL). The samples selected for analysis were collected in laboratory-supplied containers and immediately placed in an ice chest and kept cool until delivery to the laboratory. Standard chain-of-custody procedures were observed during transport of the samples to the laboratory. The results of chemical analysis are discussed further herein.

2.3. SAMPLING/ANALYTICAL RESULTS

2.3.1. QUALITY ANALYSES

SEC strives to ensure that the quality of our data meets the necessary data quality objectives. The following sections summarize the field and laboratory QA/QC procedures that were conducted during this project.

2.3.1.1. FIELD QUALITY ASSURANCE

SEC's field quality assurance program consisted of the following:

- Chain-Of-Custody procedures
- Collection and analysis of field duplicate samples (described in the 2018 RI)
- Maintenance of chain-of-custody documentation

Chain-of-custody procedures were followed during handling and transport of samples to the analytical laboratory.

All samples were collected via clean single-use disposal materials. Accordingly, there was no need to evaluate the adequacy of the equipment decontamination procedures or the possibility of cross-contamination caused by decontamination of sampling equipment. Further, the consistence of chemical analytical results (discussed below) indicates that no cross-contamination occurred.

2.3.1.2. LABORATORY QUALITY ASSURANCE

ESN Northwest and Pace Analytical, of Mt. Juliet, Tennessee maintain an internal QA program that is documented in each laboratory report. The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries, and blank spike duplicate recoveries to evaluate the chemical analytical results. Acceptability or control limits for analysis are statistically derived by the laboratory in accordance with EPA guidelines.

SEC reviewed the attached analytical data reports for data quality exceptions and deviations from



acceptable method performance criteria. Based on SEC's review of the laboratory chemical analytical data (Appendix B), SEC did not identify hold time, internal QA, or laboratory naming discrepancies and the reporting limits provided by the lab were sufficient to make comparisons to corresponding cleanup and cleanup and screening levels for the COPCs identified. Based on our review of the analytical reports, the analytical data appear acceptable for their intended use.

2.3.2. RESULTS

The chemical analytical results obtained by SEC are presented in Table 1. The chemical analytical laboratory reports and chain-of-custody documentation associated with SEC's investigation are provided in Appendix A.

2.3.2.1. SOIL CLEANUP STANDARDS AND CHEMICAL ANALYTICAL RESULTS

Based on the industrial use of the project site and the findings of the site-specific CSM, the only reasonable exposure pathways that are considered for the project site are (1) inhalation or ingestion by future site workers and (2) the leaching to groundwater pathway. The MTCA Method A industrial cleanup level for PCE was established to be theoretically protective of groundwater via the leaching pathway (Ecology 2012) and was used for comparison of the chemical analytical results for this addendum.

The supplemental soil samples¹ collected by SEC were analyzed for the selected VOCs by EPA Method 8260C. Following the implementation of IRAMs discussed herein, VOCs were either not detected at concentrations greater than laboratory reported detection limits (RDLs) or were detected at concentrations less than the MTCA Method A CUL. The soil chemical analytical results are presented on Table 1.

3. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

3.1. SUMMARY AND CONCLUSIONS

In October 2018, a Remedial Investigation Report was prepared for the Adams Street Building site located at 6707-6709 S Adams Street in Tacoma, Washington. A formal wear business historically occupied the site (circa 1999-2015). During that time, two closed-loop dry-cleaning machines and associated small-quantity materials were historically located on the project site. Between 2016 and 2018, the magnitude and extent of PCE impact was studied and a CSM was developed in accordance with MTCA. Based on the findings of the RI, the following was concluded:

- PCE is the only COPC at the project site.
- Since none of the compounds identified at the project site are listed as priority contaminants of ecological concern (listed in WAC-173-340-900; Table 749-2), no further terrestrial ecological evaluation was warranted.
- Groundwater conditions at the project site met corresponding cleanup standards and are considered protective of human health and the environment.

¹ MW3-5 (collected on 2/21/19), MW3-9.0 (collected on 2/21/19 & 11/20/19), MW3-13 (collected on 2/21/19 & 11/20/19), MW3-15 (collected on 2/21/19 & 11/20/19), and MW4-15 (collected on 2/21/19 & 11/20/19)



- The residual presence of PCE in soil met corresponding site-specific cleanup standards and is considered protective of human health and the environment.
- Indoor or ambient at the project site met corresponding cleanup standards and is considered protective of human health and the environment.
- No field evidence of chemical impact was observed by SEC during exploration activities conducted at the project site.

Although the residual presence of PCE in soil met corresponding site-specific cleanup standards, the concentrations of PCE in soil still slightly (by less than 1 part per million) exceeded the MTCA Method A CUL in two areas of the site. Accordingly, the project team opted to further remediate PCE in soil to concentrations below the MTCA Method A CUL as follows:

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Following the implementation of IRAMs discussed herein, PCE (and all other VOCs) were either not detected at concentrations greater than laboratory reported detection limits (RDLs) or were detected at concentrations less than the MTCA Method A CUL. Based on the foregoing, it is our professional opinion that soil at the project site is protective of human health and the environment.

3.2. RECOMMENDATIONS

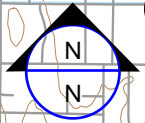
After Ecology has completed its review of this report, we respectfully request an opinion on the completed actions. In our professional opinion, the data presented in this report may warrant an opinion of "No Further Action" for the project site.

4. REFERENCES

- Ecology, 2012. *Trichloroethylene Toxicity Information and MTCA Cleanup Levels*. <https://fortress.wa.gov/ecy/clarc/FocusSheets/CLARC%20guidance%20TCE%20PCE.pdf>
- Ecology 2013 (rev). *Model Toxics Control Act Regulation and Statute*. Washington State Department of Ecology, Olympia, Washington. 324 pages. Publication No. 94-06. <http://www.ecy.wa.gov/biblio/9406.html>
- SEC 2018. *RI Report; Adams Street Building; 6707-6709 S Adams Street; Tacoma, Washington 98409*, dated October 31, 2018



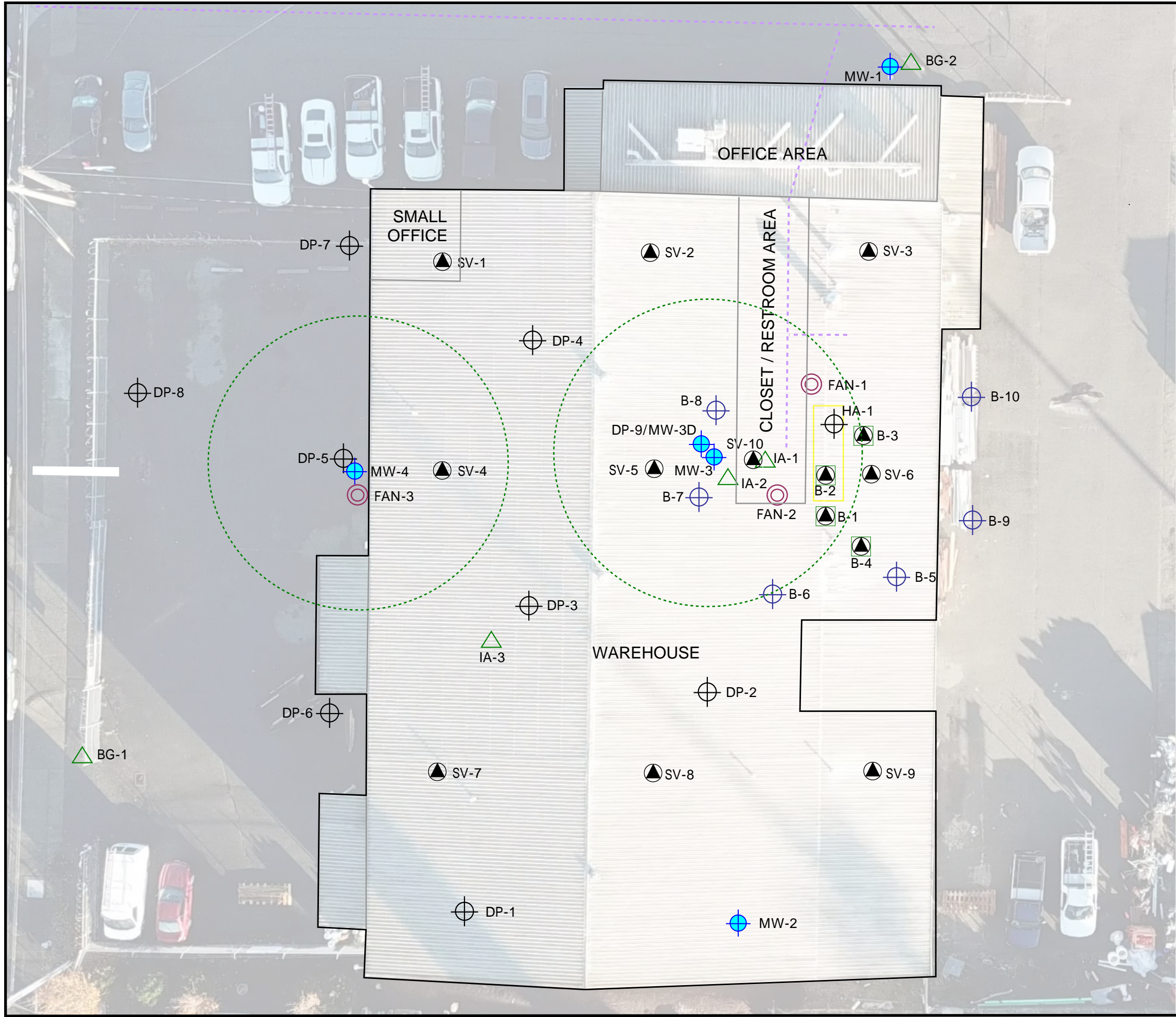
FIGURES



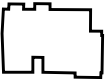
JANUARY 2020

6707-6709 S ADAMS STREET
TACOMA, WASHINGTON

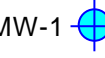
FIGURE 1



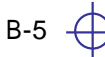
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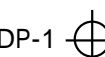
BUILDING LAYOUT




MW-1 WELL LOCATION




B-5 BORING LOCATION (AEG)




DP-1 BORING LOCATION (SEC)




B-1 SOIL GAS SAMPLE LOCATION (AEG)




SV-1 SOIL GAS SAMPLE LOCATION (SEC)




IA-1 BG-1 AIR SAMPLE LOCATION (SEC)




FAN-1 IRAM FAN LOCATION (SEC)



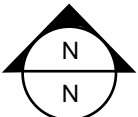
LOCATION OF FORMER DRY-CLEANING OPERATION



SANITARY SEWER LOCATION



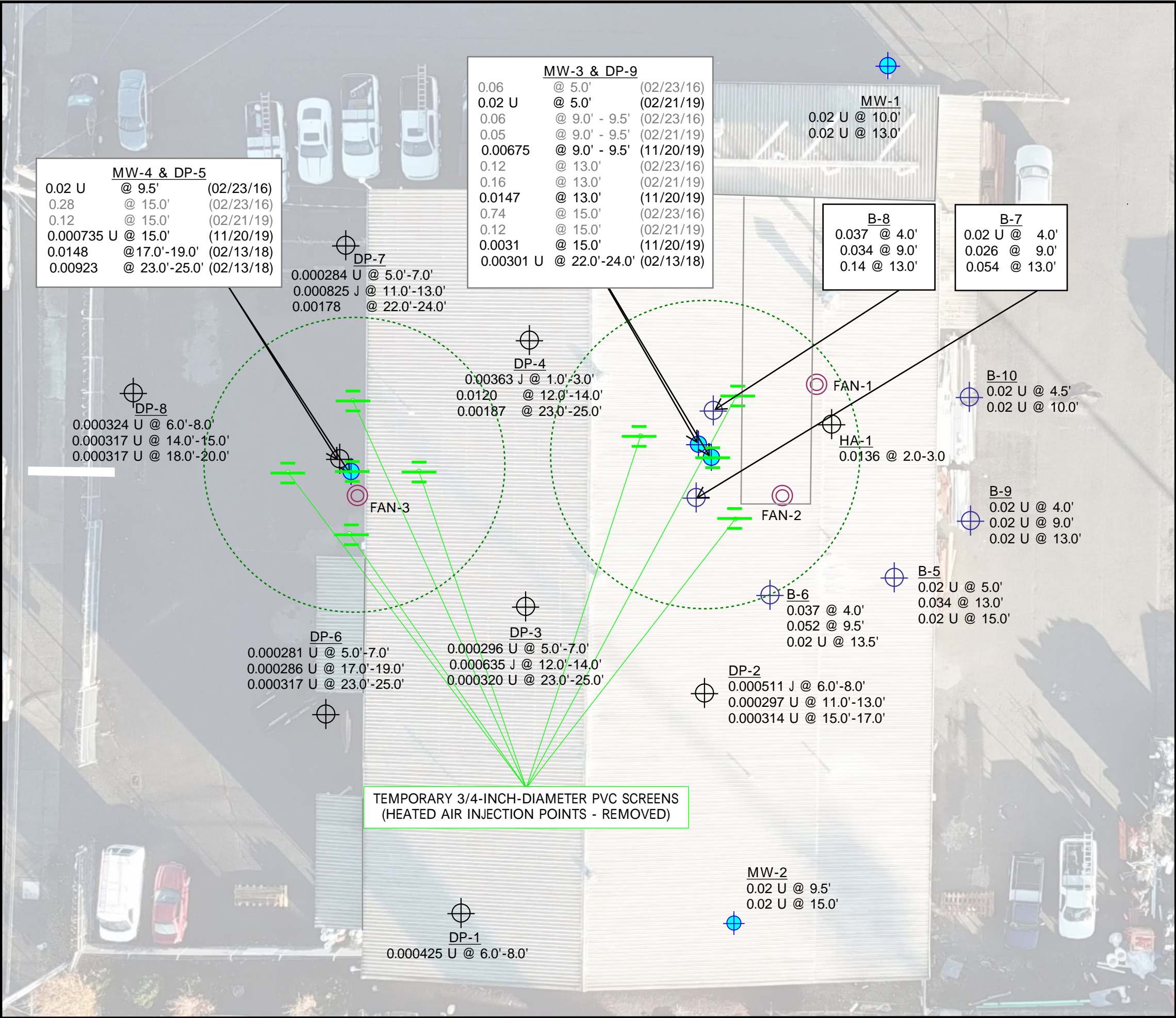
VADOZE SOIL TREATMENT AREA (SEE FIGURE 3 FOR DETAIL)



(APPROXIMATE SCALE IN FEET)

35

SITE PLAN BASED ON OBSERVATIONS MADE BY SEC. MEASUREMENTS DERIVED FROM THIS FIGURE SHOULD BE CONSIDERED APPROXIMATE.



LEGEND:

BUILDING LAYOUT

MW-1 WELL LOCATION

B-5 BORING LOCATION (AEG)

DP-1 BORING LOCATION (SEC)

FAN-1 IRAM FAN LOCATION (SEC)

HEATED AIR INJECTION POINT (JULY & AUGUST 2019)

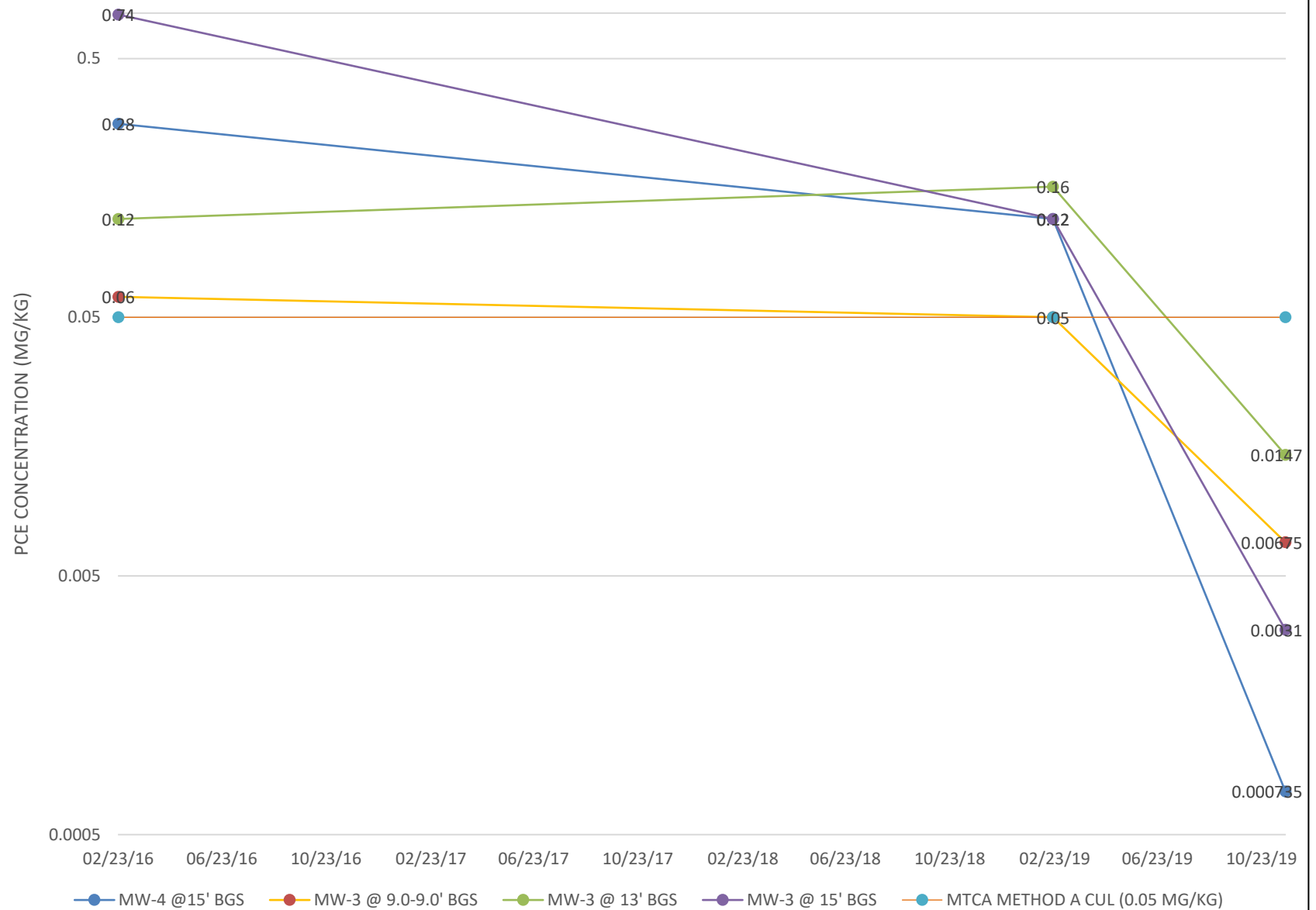
VADOZE SOIL TREATMENT AREA (EST. 15' FROM BLOWERS)

(APPROXIMATE SCALE IN FEET)

35

SITE PLAN BASED ON OBSERVATIONS MADE BY SEC. MEASUREMENTS DERIVED FROM THIS FIGURE SHOULD BE CONSIDERED APPROXIMATE.

Chart 1: PCE in Soil. 6707 S Adams Street, Tacoma, Washington





TABLE

TABLE 1
Summary of Soil Sample Chemical Analytical Results
VOCs Detected by EPA Method 8260C and Potential Breakdown Products
6707 S Adams Street
Tacoma, Washington

				Chloroform	1,1-Dichloroethene	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2- Dichloroethene	trans-1,2- Dichloroethene	Vinyl Chloride
MTCA Method A Cleanup Levels (Unrestricted Use)				NE	NE	0.05	0.03	NE	NE	NE
MTCA Method B Cleanup Levels (Cancer)				32	NE	480	12	NE	NE	NE
Sample I.D.	Depth (feet BGS)	Sample Date	Collected By	Results (mg/kg)						
B5-5	5.0	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B5-13	13.0	01/15/16	AEG	--	--	0.034	0.02 U	0.05 U	0.05 U	0.02 U
B5-15	15.0	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B6-4	4.0	01/15/16	AEG	--	--	0.037	0.02 U	0.05 U	0.05 U	0.02 U
B6-9.5	9.5	01/15/16	AEG	--	--	0.052	0.02 U	0.05 U	0.05 U	0.02 U
B6-13.5	13.5	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B7-4	4.0	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B7-9	9.0	01/15/16	AEG	--	--	0.026	0.02 U	0.05 U	0.05 U	0.02 U
B7-13	13.0	01/15/16	AEG	--	--	0.054	0.02 U	0.05 U	0.05 U	0.02 U
B8-4	4.0	01/15/16	AEG	--	--	0.037	0.02 U	0.05 U	0.05 U	0.02 U
B8-9.5	9.5	01/15/16	AEG	--	--	0.034	0.02 U	0.05 U	0.05 U	0.02 U
B8-13.5	13.5	01/15/16	AEG	--	--	0.14	0.02 U	0.05 U	0.05 U	0.02 U
B9-4	4.0	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B9-9	9.0	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B9-13	13.0	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B10-4.5	4.5	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
B10-10	10.0	01/15/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
MW1-10	10.0	02/23/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
MW1-13	13.0	02/23/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
MW2-9.5	9.5	02/23/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
MW2-15	15.0	02/23/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U

TABLE 1
Summary of Soil Sample Chemical Analytical Results
VOCs Detected by EPA Method 8260C and Potential Breakdown Products
6707 S Adams Street
Tacoma, Washington

				Chloroform	1,1-Dichloroethene	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
MTCA Method A Cleanup Levels (Unrestricted Use)				NE	NE	0.05	0.03	NE	NE	NE
MTCA Method B Cleanup Levels (Cancer)				32	NE	480	12	NE	NE	NE
Sample I.D.	Depth (feet BGS)	Sample Date	Collected By	Results (mg/kg)						
MW3-5	5.0	02/23/16	AEG	--	--	0.06	0.02 U	0.05 U	0.05 U	0.02 U
		02/21/19	SEC	0.05 U	0.05 U	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
MW3-9.5	9.0 - 9.5	02/23/16	AEG	--	--	0.06	0.02 U	0.05 U	0.05 U	0.02 U
MW3-9.0		02/21/19	SEC	0.05 U	0.05 U	0.05	0.02 U	0.05 U	0.05 U	0.02 U
		11/20/19	SEC	--	0.000515 U	0.00675	0.000412 U	0.000710 U	0.00147 U	0.000703 U
MW3-13	13.0	02/23/16	AEG	--	--	0.12	0.02 U	0.05 U	0.05 U	0.02 U
		02/21/19	SEC	0.05 U	0.05 U	0.16	0.02 U	0.05 U	0.05 U	0.02 U
		11/20/19	SEC	--	0.00104 U	0.0147	0.000834 U	0.00144 U	0.00298 U	0.00143 U
MW3-15	15.0	02/23/16	AEG	--	--	0.74	0.03 U	0.06 U	0.06 U	0.02 U
		02/21/19	SEC	0.05 U	0.05 U	0.12	0.02 U	0.05 U	0.05 U	0.02 U
		11/20/19	SEC	--	0.000513 U	0.0031	0.000410 U	0.000707 U	0.00147 U	0.000700 U
MW4-9.5	9.5	02/23/16	AEG	--	--	0.02 U	0.02 U	0.05 U	0.05 U	0.02 U
MW4-15	15.0	02/23/16	AEG	--	--	0.28	0.02 U	0.05 U	0.05 U	0.02 U
		02/21/19	SEC	0.05 U	0.05 U	0.12	0.02 U	0.05 U	0.05 U	0.02 U
		11/20/19	SEC	--	0.000525 U	0.000735 U	0.000420 U	0.000725 U	0.00150 U	0.000718 U
HA-1(2.0-3.0)	2.0-3.0	05/16/18	SEC	--	0.000580 U	0.0136	0.000464 U	0.000801 U	0.00166 U	0.000792 U
DP-1 (6.0-8.0)	6.0-8.0	02/07/18	SEC	0.000352 U	0.000466 U	0.000425 U	0.000429 U	0.000362 U	0.000406	0.000448 U
DP-2 (6.0-8.0)	6.0-8.0	02/07/18	SEC	0.000234 U	0.000310 U	0.000511 J	0.000285 U	0.000240 U	0.000270	0.000298 U
DP-2 (11.0-13.0)	11.0-13.0	02/07/18	SEC	0.000246 U	0.000326 U	0.000297 U	0.000300 U	0.000253 U	0.000284	0.000313 U
DP-2(15.0-17.0)		02/07/18	SEC	0.000261 U	0.000345 U	0.000314 U	0.000318 U	0.000268 U	0.000301 U	0.000331 U
DP-3 (5.0-7.0)	5.0-7.0	02/07/18	SEC	0.000245 U	0.000325 U	0.000296 U	0.000299 U	0.000252 U	0.000283 U	0.000312 U

TABLE 1
Summary of Soil Sample Chemical Analytical Results
VOCs Detected by EPA Method 8260C and Potential Breakdown Products
6707 S Adams Street
Tacoma, Washington

				Chloroform	1,1-Dichloroethene	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride
MTCA Method A Cleanup Levels (Unrestricted Use)				NE	NE	0.05	0.03	NE	NE	NE
MTCA Method B Cleanup Levels (Cancer)				32	NE	480	12	NE	NE	NE
Sample I.D.	Depth (feet BGS)	Sample Date	Collected By	Results (mg/kg)						
DP-3 (12.0-14.0)	12.0-14.0	02/07/18	SEC	0.000247 U	0.000327 U	0.000635 J	0.000301 U	0.000253 U	0.000285 U	0.000314 U
DP-3 (23.0-25.0)	23.0-25.0	02/07/18	SEC	0.000266 U	0.000352 U	0.000320 U	0.000324 U	0.000273 U	0.000306 U	0.000338 U
DP-4 (1.0-3.0)	1.0-3.0	02/07/18	SEC	0.000231 U	0.000306 U	0.000363 J	0.000282 U	0.000238 U	0.000267 U	0.000294 U
DP-4 (12.0-14.0)	12.0-14.0	02/07/18	SEC	0.000274 U	0.000363 U	0.0120	0.000334 U	0.000281 U	0.000316 U	0.000348 U
DP-4 (23.0-25.0)	23.0-25.0	02/07/18	SEC	0.000239 U	0.000317 U	0.00187	0.000292 U	0.000246 U	0.000276 U	0.000304 U
DP-5 (17.0-19.0)	17.0-19.0	02/07/18	SEC	0.000254 U	0.000336 U	0.0148	0.000310 U	0.000261 U	0.000293 U	0.000323 U
DP-5 (23.0-25.0)	23.0-25.0	02/07/18	SEC	0.000267 U	0.000353 U	0.00923	0.000325 U	0.000274 U	0.000306 U	0.000339 U
DP-6 (5.0-7.0)	5.0-7.0	02/07/18	SEC	0.000233 U	0.000308 U	0.000281 U	0.000284 U	0.000239 U	0.000269 U	0.000296 U
DP-6 (17.0-19.0)	17.0-19.0	02/07/18	SEC	0.000237 U	0.000314 U	0.000286 U	0.000289 U	0.000243 U	0.000273 U	0.000301 U
DP-6 (23.0-25.0)	23.0-25.0	02/07/18	SEC	0.000263 U	0.000348 U	0.000317 U	0.000320 U	0.000270 U	0.000303 U	0.000334 U
DP-7(5.0-7.0)	5.0-7.0	02/09/18	SEC	0.000236 U	0.000312 U	0.000284 U	0.000287 U	0.000242 U	0.000272 U	0.000299 U
DP-7 (11.0-13.0)	11.0-13.0	02/09/18	SEC	0.000269 U	0.000356 U	0.000825 J	0.000328 U	0.000276 U	0.000310 U	0.000342 U
DP-7 (22.0-24.0)	22.0-24.0	02/09/18	SEC	0.000248 U	0.000328 U	0.0178	0.000302 U	0.000255 U	0.000286 U	0.000315 U
DP-8 (6.0-8.0)	6.0-8.0	02/09/18	SEC	0.000269 U	0.000355 U	0.000324 U	0.000327 U	0.000276 U	0.000310 U	0.000341 U
DP-8 (14.0-15.0)	14.0-15.0	02/09/18	SEC	0.000263 U	0.000348 U	0.000317 U	0.000321 U	0.000270 U	0.000304 U	0.000335 U
DP-8 (18.0-20.0)	18.0-20.0	02/09/18	SEC	0.000263 U	0.000348 U	0.000317 U	0.000320 U	0.000270 U	0.000303 U	0.000334 U
DP-9 (24.0-26.0)	24.0-26.0	02/13/18	SEC	0.000250 U	0.000331 U	0.000301 U	0.000304 U	0.000256 U	0.000288 U	0.000317 U

TABLE 1
Summary of Soil Sample Chemical Analytical Results
VOCs Detected by EPA Method 8260C and Potential Breakdown Products
6707 S Adams Street
Tacoma, Washington

				Chloroform	1,1-Dichloroethene	Tetrachloroethene (PCE)	Trichloroethene (TCE)	cis-1,2- Dichloroethene	trans-1,2- Dichloroethene	Vinyl Chloride
MTCA Method A Cleanup Levels (Unrestricted Use)				NE	NE	0.05	0.03	NE	NE	NE
MTCA Method B Cleanup Levels (Cancer)				32	NE	480	12	NE	NE	NE
Sample I.D.	Depth (feet BGS)	Sample Date	Collected By	Results (mg/kg)						

Notes:

AEG: Associated Environmental Group, LLC

SEC: Succeed Environmental Consulting LLC

U: not detected at concentrations greater than the analytical laboratory RDL (reported)

--: not analyzed

Bolding indicates analyte was quantitatively detected at the reported concentration.

NE: not established

J: Analyte detected at a concentration greater
than the laboratory MDL, but less than the MRL.



APPENDIX

December 18, 2018

Succeed Environmental Consulting

Sample Delivery Group: L1052393

Samples Received: 12/12/2018

Project Number: HE-1

Description:

Report To: Andrew Blake
6028 NE 49th Avenue
Portland, OR 97218

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 National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.



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
MW-1 L1052393-01	5	
Qc: Quality Control Summary	6	⁴ Cn
Volatile Organic Compounds (GC/MS) by Method 8260C	6	⁵ Sr
Gl: Glossary of Terms	7	
Al: Accreditations & Locations	8	⁶ Qc
Sc: Sample Chain of Custody	9	⁷ Gl
		⁸ Al
		⁹ Sc

SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



MW-1 L1052393-01 GW

Collected by
Andrew Blake

Collected date/time
12/11/18 12:00

Received date/time
12/12/18 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Volatile Organic Compounds (GC/MS) by Method 8260C	WG1210704	1	12/14/18 00:25	12/14/18 00:25	BMB

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

ACCOUNT:

Succeed Environmental Consulting

PROJECT:

HE-1

SDG:

L1052393

DATE/TIME:

12/18/18 16:18

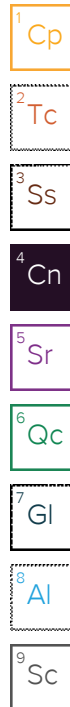
PAGE:

3 of 9



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





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

Analyte	Result ug/l	Qualifier	MDL ug/l	RDL ug/l	Dilution	Analysis date / time	Batch
Chloroform	1.27	J	0.324	5.00	1	12/14/2018 00:25	WG1210704
(S) Toluene-d8	109			80.0-120		12/14/2018 00:25	WG1210704
(S) Dibromofluoromethane	109			75.0-120		12/14/2018 00:25	WG1210704
(S) 4-Bromofluorobenzene	110			77.0-126		12/14/2018 00:25	WG1210704

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Method Blank (MB)

(MB) R3369192-4 12/13/18 21:48

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloroform	U		0.324	5.00
(S) Toluene-d8	104			80.0-120
(S) Dibromofluoromethane	107			75.0-120
(S) 4-Bromofluorobenzene	110			77.0-126

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3369192-1 12/13/18 20:09 • (LCSD) R3369192-2 12/13/18 20:29

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloroform	25.0	26.6	26.7	106	107	73.0-120			0.187	20
(S) Toluene-d8				103	103	80.0-120				
(S) Dibromofluoromethane				108	107	75.0-120				
(S) 4-Bromofluorobenzene				107	108	77.0-126				

1
Cp

2
Tc

3
Ss

4
Cn

5
Sr

6
Qc

7
Gl

8
Al

9
Sc



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.

Abbreviations and Definitions

MDL	Method Detection Limit.
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

J	The identification of the analyte is acceptable; the reported value is an estimate.
---	---

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gi

8 Ai

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	T 104704245-17-14
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.



Succeed Environmental Consulting

6028 NE 49th Avenue
Portland, OR 97218

Report to:
Andrew Blake

Project
Description: —

Phone: 971-371-0404
Fax:

Collected by (print):
Andrew Blake

Collected by (signature):
[Signature]
Immediately
Packed on Ice N Y X

Client Project #
~~054~~ E-1
Site/Facility ID #
Rush? (Lab MUST Be Notified)
Same Day Five Day
Next Day 5 Day (Rad Only)
Two Day 10 Day (Rad Only)
Three Day

City/State
Collected: Tceca, Wx

Lab Project #
SUCENVPOR-OL1

P.O. #

Quote #

Date Results Needed

Pres
Chk

Billing Information:

Andrew Blake
6028 NE 49th Ave.
Portland, OR 97218

Email To: ablake@succeed-env.com

Analysis / Container / Preservative

Chain of Custody Page 1 of 1



12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859



L# 21652393

E118

Acctnum: SUCENVPOR

Template: T142704

Prelogin: P680123

TSR: 110 - Brian Ford

PB:

Shipped Via:

Remarks Sample # (lab only)

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs
MW-1	—	GW	—	12/11/18	12:00	4
		GW				
		GW				
		GW				
		GW				
		GW				
		GW				
		GW				
		GW				
		GW				

BTEX 8260C 40mlAmb-HCl

NWTPHDX LVINOSGT 40mlAmb-HCl-BT

NWTPHGX 40mlAmb HCl

SULFATE 125mlHDPE-NoPres

Chloroform

X

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

Chloroform only

pH Temp

Flow Other

Samples returned via:
 UPS X FedEx Courier

Tracking # 4510 1658 8621

Sample Receipt Checklist

COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headpace: Y N
Preservation Correct/Checked: Y N

Relinquished by: (Signature)
[Signature]

Date: 12/11/18

Time: FED EX

Received by: (Signature)

Trip Blank Received: Yes (X) No
HCL / MeOH
TBR

Relinquished by: (Signature)

Date:

Time:

Received by: (Signature)

Temp: 10.1 °C
1.01, 1.12
Bottles Received: 4

If preservation required by Login: Date/Time

Relinquished by: (Signature)

Date:

Time:

Received for lab by: (Signature)
asm

Date: 12/12/18
Time: 830

Hold:

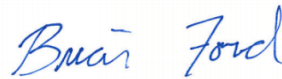
Condition:
NCF / OK

Succeed Environmental Consulting

Sample Delivery Group: L1163616
Samples Received: 11/21/2019
Project Number: HE-1
Description:

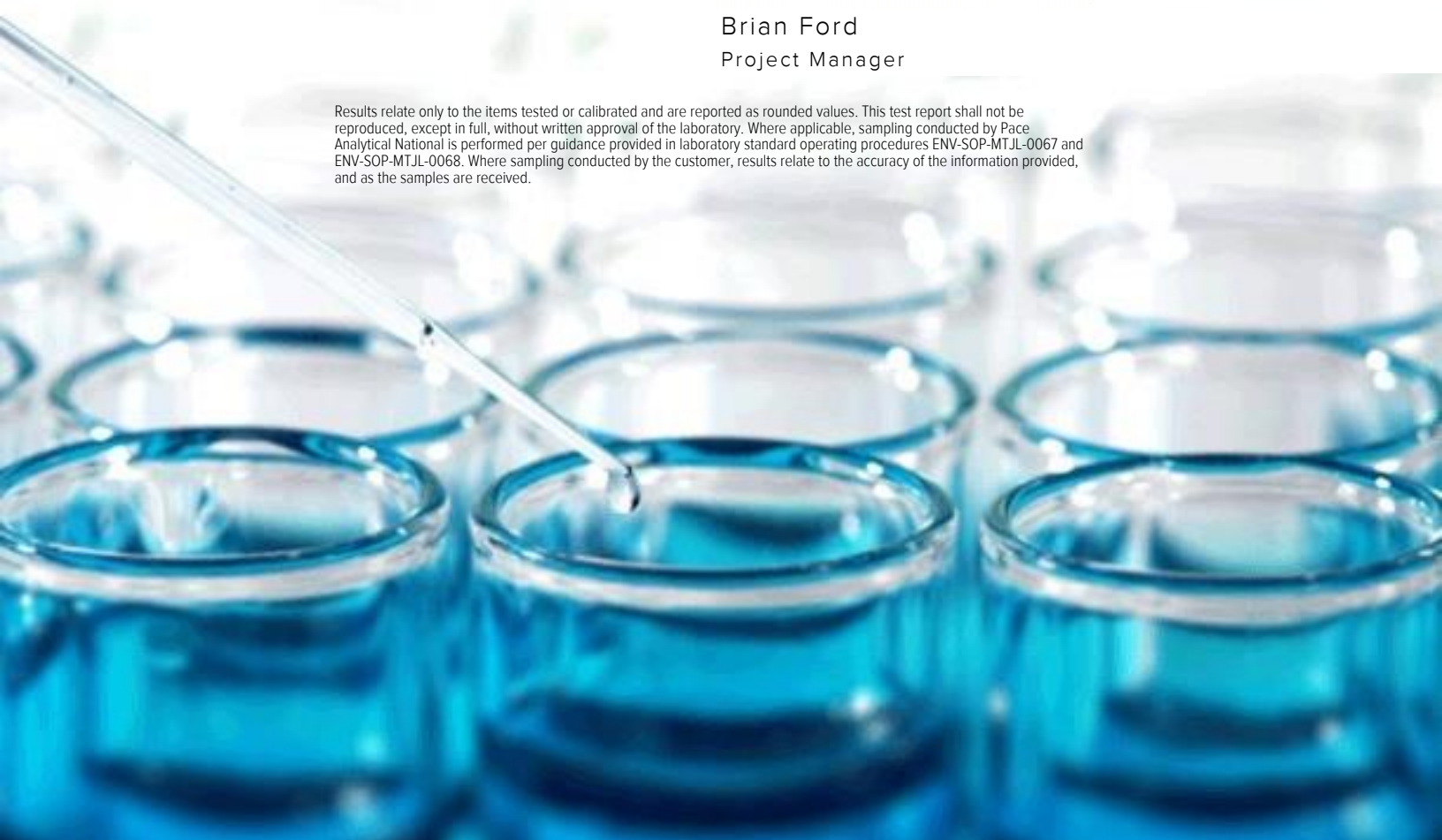
Report To: Andrew Blake
5217 NE 35th Ave.
Portland, OR 97211

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
MW4-15 L1163616-01	5	
MW3-9 L1163616-02	6	⁴ Cn
MW3-13 L1163616-03	7	⁵ Sr
MW3-15 L1163616-04	8	
Qc: Quality Control Summary	9	⁶ Qc
Total Solids by Method 2540 G-2011	9	
Volatile Organic Compounds (GC/MS) by Method 8260D	10	⁷ Gl
Gl: Glossary of Terms	11	⁸ Al
Al: Accreditations & Locations	12	
Sc: Sample Chain of Custody	13	⁹ Sc



MW4-15 L1163616-01 Solid

Collected by
Andrew BlakeCollected date/time
11/20/19 09:45Received date/time
11/21/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1387288	1	11/26/19 18:17	11/26/19 18:38	KDW	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1387876	1	11/20/19 09:45	11/27/19 11:35	BMB	Mt. Juliet, TN

¹ Cp² Tc³ Ss

MW3-9 L1163616-02 Solid

Collected by
Andrew BlakeCollected date/time
11/20/19 10:30Received date/time
11/21/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1387288	1	11/26/19 18:17	11/26/19 18:38	KDW	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1387876	1	11/20/19 10:30	11/27/19 11:54	BMB	Mt. Juliet, TN

⁴ Cn⁵ Sr⁶ Qc

MW3-13 L1163616-03 Solid

Collected by
Andrew BlakeCollected date/time
11/20/19 10:35Received date/time
11/21/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1387288	1	11/26/19 18:17	11/26/19 18:38	KDW	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1387876	1.9	11/20/19 10:35	11/27/19 12:13	BMB	Mt. Juliet, TN

⁷ Gl⁸ Al⁹ Sc

MW3-15 L1163616-04 Solid

Collected by
Andrew BlakeCollected date/time
11/20/19 10:40Received date/time
11/21/19 08:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1387288	1	11/26/19 18:17	11/26/19 18:38	KDW	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260D	WG1387876	1	11/20/19 10:40	11/27/19 12:32	BMB	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 Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	95.2		1	11/26/2019 18:38	WG1387288

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

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	U		0.000525	0.00263	1	11/27/2019 11:35	WG1387876
cis-1,2-Dichloroethene	U		0.000725	0.00263	1	11/27/2019 11:35	WG1387876
trans-1,2-Dichloroethene	U		0.00150	0.00525	1	11/27/2019 11:35	WG1387876
Tetrachloroethene	U		0.000735	0.00263	1	11/27/2019 11:35	WG1387876
Trichloroethene	U		0.000420	0.00105	1	11/27/2019 11:35	WG1387876
Vinyl chloride	U		0.000718	0.00263	1	11/27/2019 11:35	WG1387876
(S) Toluene-d8	102			75.0-131		11/27/2019 11:35	WG1387876
(S) 4-Bromofluorobenzene	88.1			67.0-138		11/27/2019 11:35	WG1387876
(S) 1,2-Dichloroethane-d4	99.4			70.0-130		11/27/2019 11:35	WG1387876

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	97.1		1	11/26/2019 18:38	WG1387288

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

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	U		0.000515	0.00257	1	11/27/2019 11:54	WG1387876
cis-1,2-Dichloroethene	U		0.000710	0.00257	1	11/27/2019 11:54	WG1387876
trans-1,2-Dichloroethene	U		0.00147	0.00515	1	11/27/2019 11:54	WG1387876
Tetrachloroethene	0.00675		0.000721	0.00257	1	11/27/2019 11:54	WG1387876
Trichloroethene	U		0.000412	0.00103	1	11/27/2019 11:54	WG1387876
Vinyl chloride	U		0.000703	0.00257	1	11/27/2019 11:54	WG1387876
(S) Toluene-d8	102			75.0-131		11/27/2019 11:54	WG1387876
(S) 4-Bromofluorobenzene	87.9			67.0-138		11/27/2019 11:54	WG1387876
(S) 1,2-Dichloroethane-d4	97.2			70.0-130		11/27/2019 11:54	WG1387876

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	91.2		1	11/26/2019 18:38	WG1387288

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

Analyte	Result (dry)	Qualifier	MDL (dry)	RDL (dry)	Dilution	Analysis date / time	Batch
	mg/kg		mg/kg	mg/kg			
1,1-Dichloroethene	U		0.00104	0.00521	1.9	11/27/2019 12:13	WG1387876
cis-1,2-Dichloroethene	U		0.00144	0.00521	1.9	11/27/2019 12:13	WG1387876
trans-1,2-Dichloroethene	U		0.00298	0.0104	1.9	11/27/2019 12:13	WG1387876
Tetrachloroethene	0.0147		0.00146	0.00521	1.9	11/27/2019 12:13	WG1387876
Trichloroethene	U		0.000834	0.00208	1.9	11/27/2019 12:13	WG1387876
Vinyl chloride	U		0.00143	0.00521	1.9	11/27/2019 12:13	WG1387876
(S) Toluene-d8	101			75.0-131		11/27/2019 12:13	WG1387876
(S) 4-Bromofluorobenzene	87.8			67.0-138		11/27/2019 12:13	WG1387876
(S) 1,2-Dichloroethane-d4	95.1			70.0-130		11/27/2019 12:13	WG1387876

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	97.5		1	11/26/2019 18:38	WG1387288

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

Analyte	Result (dry) mg/kg	Qualifier	MDL (dry) mg/kg	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
1,1-Dichloroethene	U		0.000513	0.00256	1	11/27/2019 12:32	WG1387876
cis-1,2-Dichloroethene	U		0.000707	0.00256	1	11/27/2019 12:32	WG1387876
trans-1,2-Dichloroethene	U		0.00147	0.00513	1	11/27/2019 12:32	WG1387876
Tetrachloroethene	0.00310		0.000718	0.00256	1	11/27/2019 12:32	WG1387876
Trichloroethene	U		0.000410	0.00103	1	11/27/2019 12:32	WG1387876
Vinyl chloride	U		0.000700	0.00256	1	11/27/2019 12:32	WG1387876
(S) Toluene-d8	101			75.0-131		11/27/2019 12:32	WG1387876
(S) 4-Bromofluorobenzene	89.6			67.0-138		11/27/2019 12:32	WG1387876
(S) 1,2-Dichloroethane-d4	104			70.0-130		11/27/2019 12:32	WG1387876

¹ Cp² Tc³ Ss⁴ Cn⁵ Sr⁶ Qc⁷ Gl⁸ Al⁹ Sc



(MB) R3476939-1 11/26/19 18:38

 ${}^1\text{Cp}$ ${}^2\text{Tc}$ 3S_s ${}^4\text{Cn}$ ^5Sr ⁶Qc

(OS) L1163616-01 11/26/19 18:38 • (DUP) R3476939-3 11/26/19 18:38

GI ${}^8\text{Al}$ ⁹Sc

(LCS) R3476939-2 11/26/19 18:38

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
Analyte	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3477712-3 11/27/19 05:56

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
1,1-Dichloroethene	U		0.000500	0.00250
cis-1,2-Dichloroethene	U		0.000690	0.00250
trans-1,2-Dichloroethene	U		0.00143	0.00500
Tetrachloroethene	U		0.000700	0.00250
Trichloroethene	U		0.000400	0.00100
Vinyl chloride	U		0.000683	0.00250
(S) Toluene-d8	101			75.0-131
(S) 4-Bromofluorobenzene	90.0			67.0-138
(S) 1,2-Dichloroethane-d4	99.1			70.0-130

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3477712-1 11/27/19 03:44 • (LCSD) R3477712-2 11/27/19 04:03

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,1-Dichloroethene	0.125	0.123	0.128	98.4	102	65.0-131			3.98	20
cis-1,2-Dichloroethene	0.125	0.113	0.112	90.4	89.6	73.0-125			0.889	20
trans-1,2-Dichloroethene	0.125	0.118	0.121	94.4	96.8	71.0-125			2.51	20
Tetrachloroethene	0.125	0.115	0.112	92.0	89.6	70.0-136			2.64	20
Trichloroethene	0.125	0.121	0.122	96.8	97.6	76.0-126			0.823	20
Vinyl chloride	0.125	0.155	0.164	124	131	63.0-134			5.64	20
(S) Toluene-d8				102	99.3	75.0-131				
(S) 4-Bromofluorobenzene				92.3	91.8	67.0-138				
(S) 1,2-Dichloroethane-d4				97.9	98.5	70.0-130				



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.

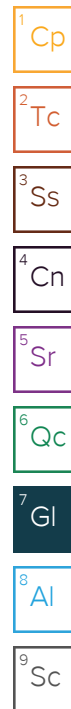
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location.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

Abbreviations and Definitions

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
MDL (dry)	Method Detection Limit.
RDL	Reported Detection Limit.
RDL (dry)	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.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
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

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.





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.



[illegible]

ESN NORTHWEST CHEMISTRY LABORATORY

SEC
HE-1 PROJECT
Tacoma, Washington

ESN Northwest
1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Halogenated Volatile Organic Compounds in Soil by Method 8260

Analytical Results

	RL	MTH BLK	LCS	MW3-5	MW3-9	MW3-13
Date extracted	(mg/Kg)	03/05/19	03/05/19	02/21/19	02/21/19	02/21/19
Date analyzed		03/05/19	03/05/19	03/05/19	03/05/19	03/05/19
% Moisture				3%	9%	11%
Dichlorodifluoromethane	0.05	nd		nd	nd	nd
Chloromethane	0.05	nd		nd	nd	nd
Vinyl chloride	0.02	nd	91%	nd	nd	nd
Bromomethane	0.05	nd		nd	nd	nd
Chloroethane	0.05	nd		nd	nd	nd
Trichlorofluoromethane	0.05	nd		nd	nd	nd
1,1-Dichloroethene	0.05	nd	67%	nd	nd	nd
Methylene chloride	0.05	nd		nd	nd	nd
trans-1,2-Dichloroethene	0.05	nd		nd	nd	nd
1,1-Dichloroethane	0.05	nd		nd	nd	nd
cis-1,2-Dichloroethene	0.05	nd		nd	nd	nd
2,2-Dichloropropane	0.05	nd		nd	nd	nd
Chloroform	0.05	nd		nd	nd	nd
Bromochloromethane	0.05	nd		nd	nd	nd
1,1,1-Trichloroethane	0.05	nd		nd	nd	nd
1,2-Dichloroethane (EDC)	0.05	nd	62%	nd	nd	nd
1,1-Dichloropropene	0.05	nd		nd	nd	nd
Carbon tetrachloride	0.05	nd		nd	nd	nd
Trichloroethene (TCE)	0.02	nd	78%	nd	nd	nd
1,2-Dichloropropane	0.05	nd	68%	nd	nd	nd
Dibromomethane	0.05	nd		nd	nd	nd
Bromodichloromethane	0.05	nd		nd	nd	nd
cis-1,3-Dichloropropene	0.05	nd		nd	nd	nd
trans-1,3-Dichloropropene	0.05	nd		nd	nd	nd
1,1,2-Trichloroethane	0.05	nd		nd	nd	nd
1,3-Dichloropropane	0.05	nd		nd	nd	nd
Dibromochloromethane	0.05	nd		nd	nd	nd
Tetrachloroethene (PCE)	0.02	nd	83%	nd	0.05	0.16
1,2-Dibromoethane (EDB)	0.01	nd		nd	nd	nd
Chlorobenzene	0.05	nd	74%	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd		nd	nd	nd
Bromoform	0.05	nd		nd	nd	nd
1,1,2,2-Tetrachloroethane	0.05	nd		nd	nd	nd
Bromobenzene	0.05	nd		nd	nd	nd
1,2,3-Trichloropropane	0.05	nd		nd	nd	nd
2-Chlorotoluene	0.05	nd		nd	nd	nd
4-Chlorotoluene	0.05	nd		nd	nd	nd
1,3-Dichlorobenzene	0.05	nd		nd	nd	nd
1,4-Dichlorobenzene	0.05	nd		nd	nd	nd
1,2-Dichlorobenzene	0.05	nd		nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.05	nd		nd	nd	nd
1,2,4-Trichlorobenzene	0.05	nd		nd	nd	nd
Hexachloro-1,3-butadiene	0.05	nd		nd	nd	nd
1,2,3-Trichlorobenzene	0.05	nd		nd	nd	nd

Surrogate recoveries:

Dibromofluoromethane	78%	72%	74%	72%	75%
Toluene-d8	104%	99%	104%	101%	106%
4-Bromofluorobenzene	107%	97%	109%	106%	108%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

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HE-1 PROJECT
Tacoma, Washington

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1210 Eastside Street SE Suite 200
Olympia, WA 98501
(360) 459-4670 (360) 459-3432 Fax
lab@esnnw.com

Analysis of Halogenated Volatile Organic Compounds in Soil by Method 8260

Analytical Results

	RL	MTH BLK	LCS	MW3-15	MW4-15
	(mg/Kg)				
Date extracted		03/01/19	03/01/19	02/21/19	02/21/19
Date analyzed		03/01/19	03/01/19	03/01/19	03/01/19
% Moisture				14%	14%
Dichlorodifluoromethane	0.05	nd		nd	nd
Chloromethane	0.05	nd		nd	nd
Vinyl chloride	0.02	nd	114%	nd	nd
Bromomethane	0.05	nd		nd	nd
Chloroethane	0.05	nd		nd	nd
Trichlorofluoromethane	0.05	nd		nd	nd
1,1-Dichloroethene	0.05	nd	120%	nd	nd
Methylene chloride	0.05	nd		nd	nd
trans-1,2-Dichloroethene	0.05	nd		nd	nd
1,1-Dichloroethane	0.05	nd		nd	nd
cis-1,2-Dichloroethene	0.05	nd		nd	nd
2,2-Dichloropropane	0.05	nd		nd	nd
Chloroform	0.05	nd		nd	nd
Bromochloromethane	0.05	nd		nd	nd
1,1,1-Trichloroethane	0.05	nd		nd	nd
1,2-Dichloroethane (EDC)	0.05	nd	120%	nd	nd
1,1-Dichloropropene	0.05	nd		nd	nd
Carbon tetrachloride	0.05	nd		nd	nd
Trichloroethene (TCE)	0.02	nd	120%	nd	nd
1,2-Dichloropropane	0.05	nd	122%	nd	nd
Dibromomethane	0.05	nd		nd	nd
Bromodichloromethane	0.05	nd		nd	nd
cis-1,3-Dichloropropene	0.05	nd		nd	nd
trans-1,3-Dichloropropene	0.05	nd		nd	nd
1,1,2-Trichloroethane	0.05	nd		nd	nd
1,3-Dichloropropane	0.05	nd		nd	nd
Dibromochloromethane	0.05	nd		nd	nd
Tetrachloroethene (PCE)	0.02	nd	130%	0.12	0.12
1,2-Dibromoethane (EDB)	0.01	nd	121%	nd	nd
Chlorobenzene	0.05	nd	142%	nd	nd
1,1,1,2-Tetrachloroethane	0.05	nd		nd	nd
Bromoform	0.05	nd		nd	nd
1,1,2,2-Tetrachloroethane	0.05	nd		nd	nd
Bromobenzene	0.05	nd		nd	nd
1,2,3-Trichloropropane	0.05	nd		nd	nd
2-Chlorotoluene	0.05	nd		nd	nd
4-Chlorotoluene	0.05	nd		nd	nd
1,3-Dichlorobenzene	0.05	nd		nd	nd
1,4-Dichlorobenzene	0.05	nd		nd	nd
1,2-Dichlorobenzene	0.05	nd		nd	nd
1,2-Dibromo-3-Chloropropane	0.05	nd		nd	nd
1,2,4-Trichlorobenzene	0.05	nd		nd	nd
Hexachloro-1,3-butadiene	0.05	nd		nd	nd
1,2,3-Trichlorobenzene	0.05	nd		nd	nd

Surrogate recoveries:

Dibromofluoromethane	93%	142%	79%	96%
Toluene-d8	94%	101%	107%	102%
4-Bromofluorobenzene	94%	102%	102%	101%

Data Qualifiers and Analytical Comments

nd - not detected at listed reporting limits
Acceptable Recovery limits: 65% TO 135%
Acceptable RPD limit: 35%

CHAIN-OF-CUSTODY RECORD

CLIENT: SEC						DATE: 2/24/19		PAGE 1 OF 1
ADDRESS: 6028 NE 49 th Avenue, Portland, OR 97218						PROJECT NAME: HE-1		
PHONE: 971-371-0404						LOCATION: Tacoma, WA		
FAX:								
CLIENT PROJECT #: HE-1						PROJECT MANAGER: Andrew Blake		
COLLECTOR: Andrew Blake						DATE OF COLLECTION: 2/24/19		

Sample Number	Depth	Time	Sample Type	Container Type	ANALYSES										NOTES	Total Number of Containers	Laboratory Note Number				
					TPH - HClD	TPH - Diesel & Oil	BTEX	VOC 8260CL	SemiVol 8270	VOC 8260	PAH's 8270	PCB's 8270	CL Pesticides 8082	RCRA 8 Metals				Pb	Astbestos - PLM	GRO Suite	DRO Suite
1. MW3-5	↓	9:15	S	T															HOLD MW3-5	3	
2. MW3-9	↓	9:18	I																HOLD	3	
3. MW3-13		9:20	✓																HOLD	3	
4. MW3-15		9:22																	S-DAY TAT	3	
5. MW3-19		9:25																	HOLD	3	
6. MW4-13		10:20																	HOLD	3	
7. MW4-15		10:35																	S-DAY TAT	3	
8.																					
9.																					
10.																					
11.																					
12.																					
13.																					
14.																					
15.																					
16.																					
17.																					
18.																					

RELINQUISHED BY (Signature)		DATE/TIME	RECEIVED BY (Signature)	DATE/TIME
		2/21/19 11:00		2-21-19 11:00

RELINQUISHED BY (Signature)		DATE/TIME	RECEIVED BY (Signature)	DATE/TIME

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	
CHAIN OF CUSTODY SEALS Y/N/NA	
SEALS INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	
NOTES:	

Turn Around Time: 24 HR 48 HR 5 DAY