



To:	Kum Kang	From:	Andrew S. Blake, L.G., R.G.
Company:	TH & JP LLC	Date:	December 12, 2023
Address:	11150 SE Rimrock Drive Happy Valley, OR 97086		
cc:	Mark Pugh, Oregon Department of Environmental Quality Tera Heintz, TH & JP LLC		
SEC Project:	ECSI# 6478		
RE:	November 2023 Technical Memorandum: VES Monitoring Results – Month 3 (1 st Quarter) 4300 NE Hancock Street Portland, Oregon 97213-1428		

Succeed Environmental Consulting LLC (SEC) is pleased to present this memorandum discussing the results of Month 3 (1st Quarterly) VES monitoring activities completed at 4300 NE Hancock Street in Portland, Oregon (project site). The 0.34-acre Subject Property includes the western portion of tax lot 4900 of Multnomah County tax map 1N2E30CC and consists of a multi-tenant commercial building. The property is currently occupied by a commercial dry-cleaning facility (Tie’s), a gym, and a fish store. A release of chlorinated solvents [primarily tetrachloroethylene (PCE)] was identified in soil and sub-slab vapor at the project site in 2021. In September 2022, six indoor air samples were collected from interior portions of the site, and six sub-slab vapor samples were collected from dedicated sample ports at the site. In March 2023, another six indoor air samples were collected from interior portions of the site, and another six sub-slab vapor samples were collected from the dedicated sample ports at the site. The vapor sampling results are discussed in as discussed in SEC’s March 2023 memorandum¹, and indicated that sub-slab vapor and indoor air was adversely impacted by the previous release of VOCs (see Tables 1 and 2).

On May 31, 2021, SEC and Advanced Remediation Technologies, Inc. (ARM) prepared an Interim Remedial Action Plan (IRAP)² to construct a sub-surface depressurization (SSD) system at the site. The Oregon Department of Environmental Quality (DEQ) reviewed the IRAM and suggested the addition of a granular activated carbon (GAC) filter to the SSD system to ensure acceptable emissions criteria are met for the site. Following the review of an EPA AERSCREEN model that was prepared by SEC, a GAC filter was incorporated into SSD system design, and SEC proceeded with the IRAM on June 8, 2023. The SSD system was activated on August 8, 2023, and system monitoring commenced in accordance with the IRAM shortly thereafter. GAC filter is an integral part of the SSD system. PCE concentrations will eventually decrease to levels that will allow for removal of the GAC. Disconnection of the GAC is not anticipated at this time, but SEC will update the AERSCREEN model (Tables 3 through 5) to incorporate site-specific measurements for DEQ review prior to removal. The third month (1st Quarter) of SSD system monitoring is discussed herein.

¹ Technical Memorandum Re: *March 2023 Vapor Sample Results; 4300 NE Hancock Street; Portland, Oregon 97213-1428*, prepared by SEC, dated March 25, 2023.

² *Interim Remedial Action Plan; Tie’s Drycleaner Property; 4300 NE Hancock Street; Portland, Oregon 97213; ECSI #6478*, prepared by ARM and SEC, dated May 12, 2023, revised May 31, 2023.



A vicinity map is presented on Figure 1. The approximate configuration of the SSD system and the sub-slab monitoring ports are presented on Figure 2. It should be noted that SEC intends to include a third and fourth figure in our next memorandum, which will allow SEC to display the SSD system, sub-slab monitoring ports, and indoor air sample locations on separate figures (currently shown on Figure 2).

INDOOR AIR EVALUATION: FIRST QUARTERLY EVENT

On November 2, 2023, SEC collected two indoor air samples (Fish Front and TIE's Rear) at the Subject Property for analysis of VOCs by Environmental Protection Agency (EPA) method TO-15. These two sample locations were selected, as they previously exhibited the highest concentrations of PCE in their respective spaces. Both samples were collected using laboratory a provided 6-liter Summa™ canisters with in-line filters restricting air flow to evaluate indoor air representative of a workday. Each sample was shipped to Friedman and Bruya of Seattle, Washington, under general chain-of-custody protocols for analysis of volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method TO-15.

The VOC 1,2-dichloroethane was detected in the Fish Store air sample, but does not appear to originate from beneath the building's floor slab (this compound has not been detected in any previous soil-gas samples or SVE effluent samples). No other VOCs were detected at concentrations greater than corresponding screening levels for the Subject Property. The results are presented on Table 1. A copy of the November 2, 2023, chemical analytical laboratory report is attached to this memorandum.

SSD SYSTEM EVALUATION

Between August 8 and November 2, 2023, SEC accessed and monitored the SSD system at each depressurization point³, and at the system effluent (before and after the GAC filter). SSD monitoring consisted of the collection of pressure and/or photoionization detector (PID) readings from each sample point, and the collection of effluent flow velocity measurements. It should also be noted that SSD-8 was reactivated at the site. The results are summarized on Table 6, and generally indicate the following:

- The moisture knock-out was monitored for the presence of condensation on October 4, 2023. There was not moisture observed within the knock-out. This may be due to evaporation, as the temperature of the knock-out which was measured between 132.6 ° and 147° Fahrenheit (located in Tie's boiler room).
- The SSD system is creating a vacuum beneath the building
- The effluent fan is creating a vacuum within the piping of the SSD system.
- PID readings were not recorded at the individual sub-slab vapor points or SSDs. Historical PID readings were noted at the system effluent location. Based on effluent sample results, which have generally been non-detect for VOCs, these readings is likely attributable to moisture and/or the warm temperatures observed in the room, where the GAC and moisture knockout are located.
- Measured effluent flow velocities range between approximately 380 and 590 feet per minute (FPM), and appear to be increasing as the SSD system remains in operation.
- Calculated effluent flow volumes range between approximately 42 and 63.6 cubic feet per minute (CFM), and appear to be increasing as the SSD system remains in operation.

³ SSD-1 through SSD-9



SUB-SLAB VAPOR EVALUATION

Between August 8 and November 2, 2023, SEC accessed monitored vapor from seven dedicated sample ports⁴. SSV monitoring consisted of the collection of pressure readings from each sample point. Prior to the October 4 event, monitoring also consisted of the collection of PID readings. However, the PID data was deemed unnecessary, as forthcoming indoor air samples will service as indicators of compliance.

Pressure readings at the SSD locations were taken with a Dwyer 2000 Magnehelic with a pressure range of 0.00" to 15" inches of water (IOW) $\pm 2\%$. Pressure readings at the sub-slab vapor monitoring locations were taken with a Dwyer 2000 Magnehelic with a pressure range of 0.00" to 0.25" IOW $\pm 2\%$. SEC's results are summarized on Table 7, and indicate that the SSD system is maintaining a vacuum beneath the building.

EFFLUENT EVALUATION

On August 8, August 17, September 6, October 4, and November 2, 2023, SEC collected samples at the system effluent (before and after the GAC filter) for analysis of VOCs by Environmental Protection Agency (EPA) method TO-15.

All samples were collected using sampling equipment consisting of laboratory a provided 1-liter Summa™ canister with in-line filters (0.7 micron) and a flow controller (restricting air flow to a rate of less than 200 milliliters per minute), which was connected to dedicated stainless-steel soil-gas sampling probes via Teflon™ tubing. Each sample was shipped to Friedman and Bruya of Seattle, Washington, under general chain-of-custody protocols for analysis of volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method TO-15.

A copy of the November 2, 2023, chemical analytical laboratory report, and laboratory chain-of-custody documentation is attached to this memorandum. The results are presented on Table 8 and confirm the following:

- The GAC is successfully filtering contamination from the influent air prior to discharge.
- PCE concentrations have decreased continuously since the SSD system was activated.

It is noted that these results were previously compared to reference air dispersion values that were calculated using AERSCREEN software prior to system activation. Since discharge velocities are changing and the GAC is successfully filtering contamination from influent air prior to discharge, no new model has been created. However, before the GAC is disconnected, SEC will update the AERSCREEN model for DEQ review and approval.

CONCLUSION

Based on the results of this assessment, it appears that SSD system is currently removing sub-slab vapor that has been adversely impacted by the previous release of VOCs that occurred at the subject property. SEC will continue to monitor the SSD system in accordance with the IRAP, and will provide the second quarterly monthly memorandum in March 2023.

⁴ SS Fish, SS Gym, SS Tie's ENE, SS Tie's ESE, SS Tie's ESE, SS Tie's NW, SS Tie's SE, and SS Tie's SW



**SUCCEED
ENVIRONMENTAL
CONSULTING, LLC**

Memorandum

We truly appreciate the opportunity to be of service to you and stand ready to provide you with any further assistance that may be required for this project.

Sincerely,
Succeed Environmental Consulting, LLC

A handwritten signature in blue ink that reads "Andrew Blake".

Andrew S. Blake, R.G.
Principal Geologist



Expires 06/30/2024

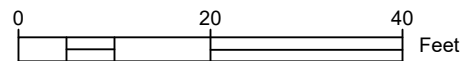
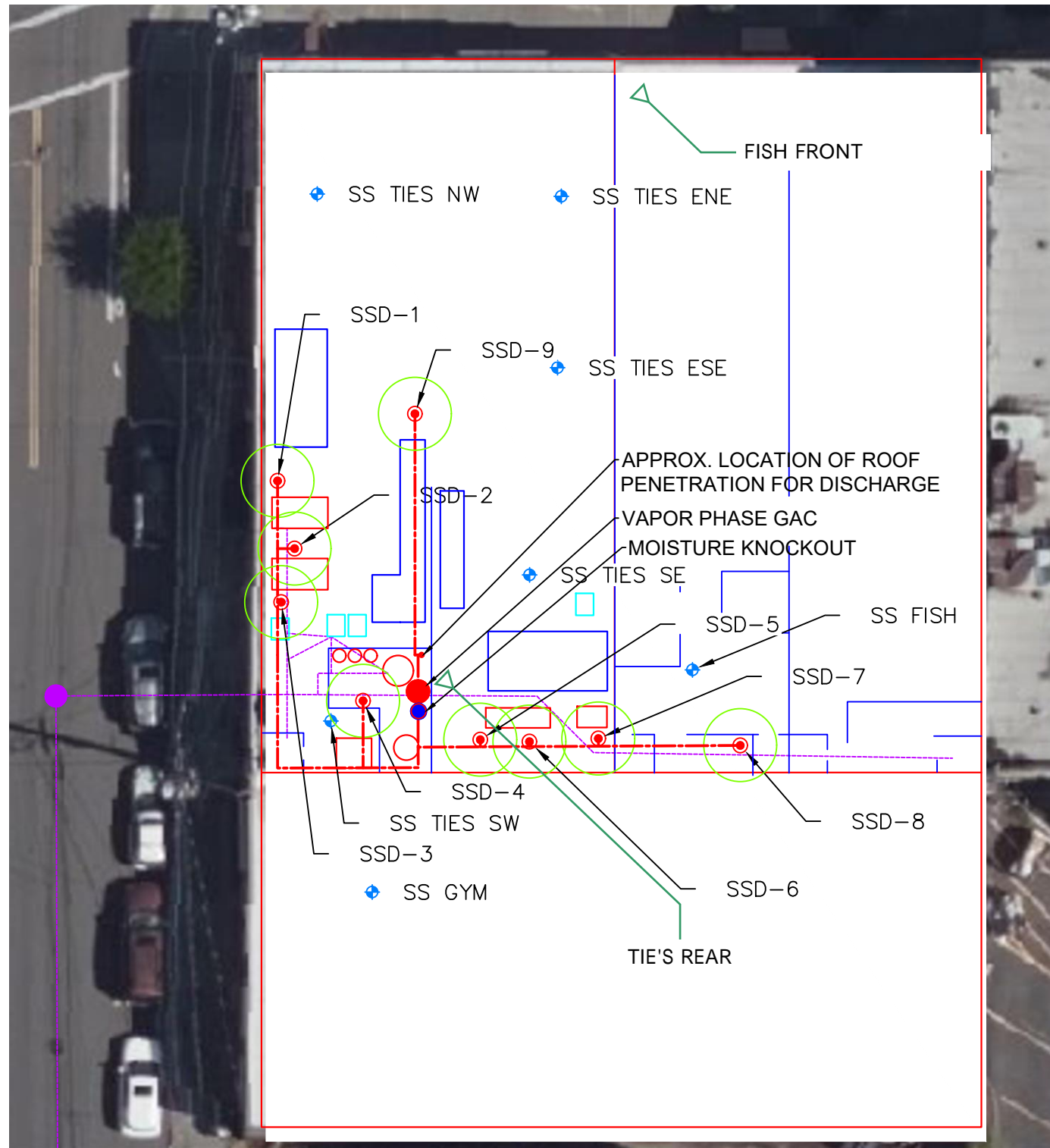
One electronic copy submitted
Document ID: 2023-12-12-SEC-TIE'S-1-envm VES_Monitoring_Month_3-QTR_1
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Tie's Dry Cleaners 4300 NE Hancock Street Portland, Oregon



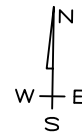
0 0.1 0.2 0.4 0.6 0.8
Miles

FIGURE 1
SITE LOCATION



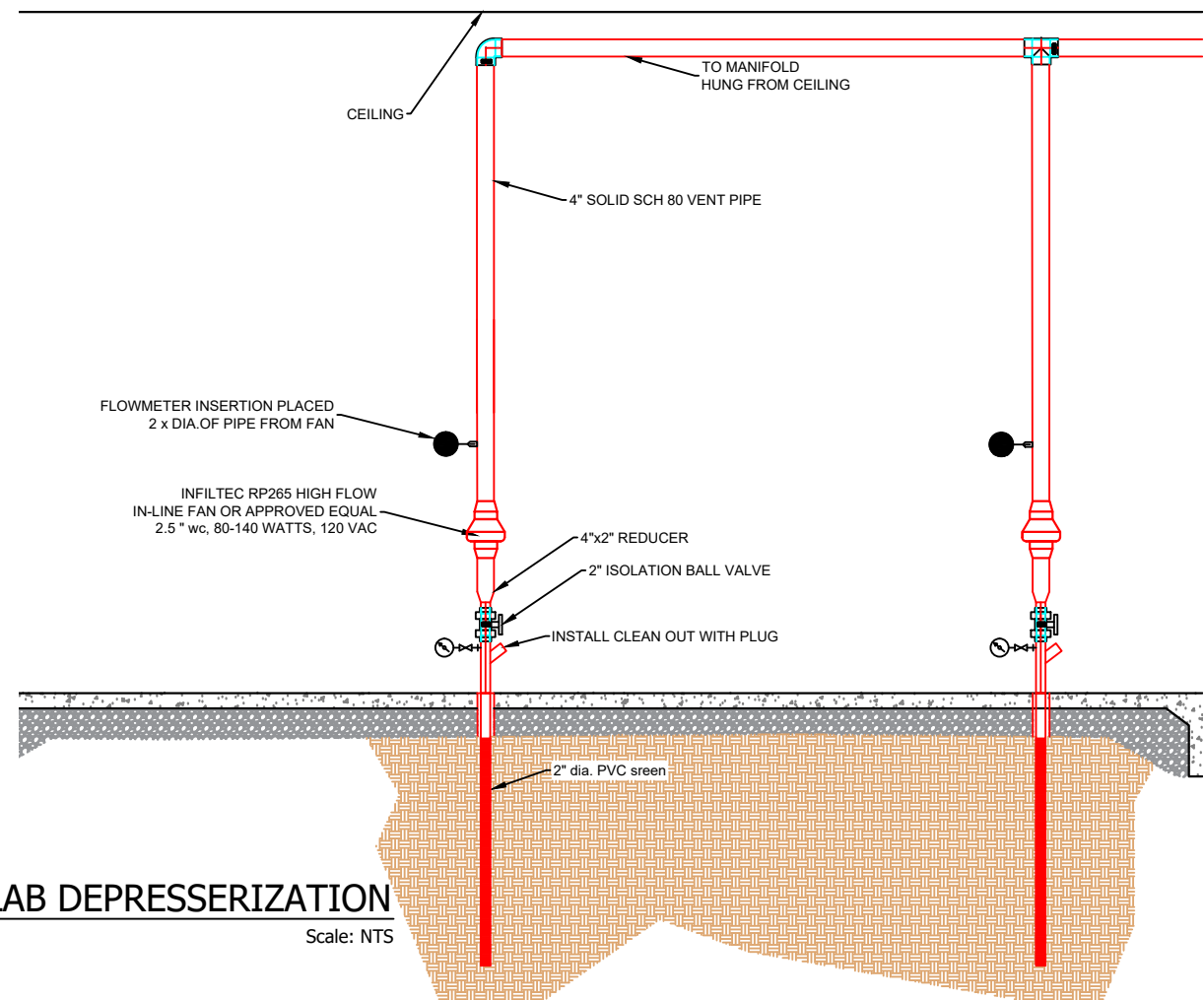
LEGEND

- ⊕ SUB SLAB VAPOR SAMPLE LOCATION
- ⊙ SUB SLAB DEPRESSURIZATION POINT
- SANITARY SEWER
- INDOOR AIR SAMPLE
- VACUUM GAUGE
- AIR FLOW GAUGE



1 DISCHARGE DETAIL

Scale: NTS



2 SUBSLAB DEPRESSERIZATION

Scale: NTS

REVISION INFORMATION	
DATE	REVIEWING AGENCY
	DEC
MILESTONE	
SSD	
SDD AS-BUILT	

"PARTNERS IN SERVICE"
Advanced Remediation Technologies, Inc
 890 NW 1ST AVENUE, SUITE 108
 CANBY, OREGON 97013
 (503) 266-9722

SUCCESS ENVIRONMENTAL, LLC
TIE'S DRYCLEANERS
 4300 NE HANCOCK ST, PORTLAND, OREGON
SITE PLAN, FIGURE 2

DATE	04/21/23
DRAWN	LAD
DESIGN	LAD
CHECK	KAD
SCALE	D
SITE PLAN	
SHEET	1 OF 1

TABLE 1
SUMMARY OF INDOOR AIR SAMPLE ANALYTICAL RESULTS
cVOCs DETECTED BY EPA METHOD TO-15
4300 NE HANCOCK STREET
PORTLAND, OREGON

Matrices: Air

Client Sample ID		Ambient		Gym		Tie's Front		Tie's Middle		Tie's Rear			Fish Front			Fish Back		DEQ Risk-Based Concentration (RBC) for Air Inhalation	
Collected By		AEG	SEC	AEG	SEC	AEG	SEC	AEG	SEC	AEG	SEC	SEC	AEG	SEC	SEC	AEG	SEC		
Date Collected		9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023	11/2/2023	9/3/2022	3/10/2023	11/2/2023	9/3/2022	3/10/2023		
Method	Analyte	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Occupational Receptor
TO-15	Tetrachloroethene	ug/m3	0.568	8.8 U	8.16	14	0.404 U	27	3.28	31	3.89	46	6.1 U	0.404	300 ve	6.9 J	14.7	210 ve	47
TO-15	Trichloroethene	ug/m3	0.0537 U	0.14 U	0.0537 U	0.13 U	0.0537 U	0.24	0.139	0.28	0.165	0.32	0.16 U	0.0537 U	0.59	0.17 U	0.0537 U	0.40	2.9
TO-15	1,2-Dichloroethane	ug/m3	0.0405 U	0.15	0.0405 U	0.15	0.0405 U	0.15	0.0405 U	0.17	0.0405 U	0.24	0.079	0.0405 U	3	1.5	1.13	2.55	0.47
TO-15	cis-1,2-Dichloroethene	ug/m3	0.396 U	0.52 U	0.396 U	0.48 U	0.396 U	0.52 U	0.396 U	0.4 U	0.396 U	0.4 U	0.59 U	0.396 U	0.4 U	0.63 U	0.396 U	0.63 U	>Pv
TO-15	trans-1,2-Dichloroethene	ug/m3	0.198 U	0.52 U	0.198 U	0.48 U	0.198 U	0.52 U	0.198 U	0.4 U	0.198 U	0.4 U	0.59 U	0.198 U	0.4 U	0.63 U	0.198 U	0.63 U	>Pv
TO-15	Vinyl Chloride	ug/m3	0.0256 U	0.17 Uj	0.0256 U	0.16 Uj	0.0256 U	0.17 Uj	0.0256 U	0.26 U	0.0256 U	0.26 U	0.23 U	0.0256 U	0.26 U	0.25 U	0.0256 U	0.21 Uj	2.8

Notes:

Bolding indicates analyte detection.

NE: not established.

>Pv: The air concentration reported for the RBC exceeds the vapor pressure of the pure chemical.

U: Analyte was not detected at a concentration greater than the laboratory reporting limit (shown).

j: The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

ve: The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

Shading indicates RBC exceedance.

TABLE 2
SUMMARY OF SUB-SLAB VAPOR SAMPLE ANALYTICAL RESULTS
eVOCs DETECTED BY EPA METHOD TO-15
4300 NE HANCOCK STREET
PORTLAND, OREGON

Matrices: Air

Client Sample ID		SS Fish		SS Gym		SS Tie's ENE		SS Tie's ESE		SS Tie's NW		SS Tie's SE		SS Tie's SW		DEQ Risk-Based Concentration (RBC) for Vapor Intrusion	
Collected By		AEG	SEC	AEG	SEC	AEG	SEC	AEG	SEC	AEG	SEC	AEG	SEC	AEG	SEC		
Date Collected		9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023	9/3/2022	3/10/2023		
Method	Analyte	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Occupational Receptor	
TO-15	Tetrachloroethene	ug/m3	14,200 e	220,000 ve	10,400 e	13,000 ve	10,000 e	29,000 ve	11,900 e	110,000 ve	9,340 e	13,000 ve	14,200 e	170,000 ve	13,500 e	76,000 ve	47,000
TO-15	Trichloroethene	ug/m3	515 e	250	44.1	25	33.7	14	120	57	645 e	40	515 e	300	9,950 e	5,800	2,900
TO-15	1,2-Dichloroethane	ug/m3	0.162 U	220 U	0.162 U	0.77 U	0.162 U	0.73 U	0.162 U	11 U	0.162 U	0.81 U	0.162 U	21 U	0.162 U	11 U	470
TO-15	cis-1,2-Dichloroethene	ug/m3	1.80	220 U	1.59 U	17	1.92	7.1 U	2.66	110 U	174	44	1.80	210 U	3,170 e	7,400	>Pv
TO-15	trans-1,2-Dichloroethene	ug/m3	1.44	220 U	0.793 U	7.5 U	0.793 U	7.1 U	0.793 U	110 U	1.9	7.9 U	1.44	210 U	231	110 U	>Pv
TO-15	Vinyl Chloride	ug/m3	0.0102 U	140 U	0.102 U	4.9 U	0.102 U	4.6 U	0.102 U	72 U	0.102 U	5.1 U	0.102 U	140 U	0.729	72 U	92.9

Notes:

Bolding indicates analyte detection.

NE: not established.

>Pv: The air concentration reported for the RBC exceeds the vapor pressure of the pure chemical.

U: Analyte was not detected at a concentration greater than the laboratory reporting limit (shown).

j: The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.

ve: The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

e: value above quantitative range.

Shading indicates RBC exceedance.

TABLE 3
AERSCREEN MODEL PARAMETERS
4300 NE HANCOCK STREET
PORTLAND, OREGON

Site Information	
Building Length (m)	44.0
Building Width (m)	30.0
Building Height (m)	5.0
Stack Height (m)	0.91
SSV Exit Velocity (m/s)	
SSV Exit Flow Rate (m ³ /s)	
Stack Inside Diameter (m)	0.089
Ground Elevation (Default Selected)	0.0
Base Elevation (m)	5.0
Roof Height (m)	5.91
Ambient Temperature (C)	25.0
Ambient Temperature (K)	298.15
Distance to Nearest Building (m)	22.00

2022 Maximum Vapor Sample Concentrations		
Compound of Interest	Maximum Concentration (ug/m ³)	Emission Rate (g/s)
PCE	220,000	
TCE	9,500	

SSD Filtration Threshold (Maximum Allowable - Would Not Require Filtration)		
Compound of Interest	Concentration (ug/m ³)	Emission Rate (g/s)
PCE	125	
TCE	8	

AERSCREEN DEFAULT PARAMETERS		
Min. Wind Speed (m/s):	0.5 (Default)	MIN/MAX TEMPS (K)
Albedo:	0.2 (Typical Roof)	258.1 / 311.5 (Typical)
Bowen Ratio:	1.5 (Typical Urban/Residential Area)	ANEMOMETER HT. (m)
Roughness Length (m):	1	10 (Default)

Notes:

1. Downwash Is Not Considered (Distance between Stack and Nearby Buildings is Less than the Length of the Building)
 2. Background Concentration of Compounds Modeled is Negligible.
 3. Flat Terrian Assumptions Have Been Utilized for this Study.
 4. No Fumigation Requested
- Blue Highlighting Indicates Value Will Be Recalculated Prior to Removing Carbon Filtration.

**TABLE 4
AERSCREEN THRESHOLD VALUES (MAXIMUM ALLOWED WITHOUT FILTRATION)
4300 NE HANCOCK STREET
PORTLAND, OREGON**

AMBIENT AIR CONCENTRATION ASSESSMENT		Concentration ($\mu\text{g}/\text{m}^3$)					
		Maximum 1-Hour		Annual Average		Toxicity Reference Values ¹ (Chronic / Acute)	
Location	Distance from Source (m)	PCE	TCE	PCE	TCE	PCE	TCE
SSD VENT	0.0					3.8 / 41	0.24 / 2.1
FRESH AIR INTAKE	1.0						
NEAREST SIDEWALK	7.5						
NEAREST RESIDENCE	27.0						
HUMAN HEALTH RISK ASSESSMENT (COMMERCIAL RECEPTOR)		Concentration ($\mu\text{g}/\text{m}^3$)					
		Maximum 1-Hour		Maximum 8-Hour		Commercial Inhalation RBCs ² (Chronic / Acute)	
Location	Distance from Source (m)	PCE	TCE	PCE	TCE	PCE	TCE
SSD VENT	0.0					47 / 120	3.0 / 6.3
FRESH AIR INTAKE	1.0						
NEAREST SIDEWALK	7.5						
HUMAN HEALTH RISK ASSESSMENT (RESIDENTIAL RECEPTOR)		8					
		Maximum 1-Hour		Maximum 24-Hour		Residential Inhalation RBCs ² (Chronic / Acute)	
Location	Distance from Source (m)	PCE	TCE	PCE	TCE	PCE	TCE
NEAREST RESIDENCE	27.0					11 / 41	0.48 / 2.1

Notes:

1. DEQ Division 246, Oregon State Air Toxics Program, 340-247-8010, Table 2

2. DEQ Air Inhalation RBCs dated June 2023.

--: Not Calculable / Not Applicable

Blue Highlighting Indicates Value Will Be Recalculated Prior to Removing Carbon Filtration.

Shading Indicates Screening Level Exceedance or Likely Exceedance

**TABLE 5
AERSCREEN MODEL RESULTS (BASED ON 2022 MAXIMUM SSV CONCENTRATIONS)
4300 NE HANCOCK STREET
PORTLAND, OREGON**

AMBIENT AIR CONCENTRATION ASSESSMENT		Concentration ($\mu\text{g}/\text{m}^3$)					
		Maximum 1-Hour		Annual Average		Toxicity Reference Values ¹ (Chronic / Acute)	
Location	Distance from Source (m)	PCE	TCE	PCE	TCE	PCE	TCE
SSD VENT	0.0					3.8 / 41	0.24 / 2.1
FRESH AIR INTAKE	1.0						
NEAREST SIDEWALK	7.5						
NEAREST RESIDENCE	27.0						
HUMAN HEALTH RISK ASSESSMENT (COMMERCIAL RECEPTOR)		Concentration ($\mu\text{g}/\text{m}^3$)					
		Maximum 1-Hour		Maximum 8-Hour		Commercial Inhalation RBCs ² (Chronic / Acute)	
Location	Distance from Source (m)	PCE	TCE	PCE	TCE	PCE	TCE
SSD VENT	0.0					47 / 120	3.0 / 6.3
FRESH AIR INTAKE	1.0						
NEAREST SIDEWALK	7.5						
HUMAN HEALTH RISK ASSESSMENT (RESIDENTIAL RECEPTOR)		Concentration ($\mu\text{g}/\text{m}^3$)					
		Maximum 1-Hour		Maximum 24-Hour		Residential Inhalation RBCs ² (Chronic / Acute)	
Location	Distance from Source (m)	PCE	TCE	PCE	TCE	PCE	TCE
NEAREST RESIDENCE	27.0					11 / 41	0.48 / 2.1

Notes:

1. DEQ Division 246, Oregon State Air Toxics Program, 340-247-8010, Table 2
 2. DEQ Air Inhalation RBCs dated June 2023.
- : Not Calculated / Not Applicable
Shading Indicates Screening Level Exceedance or Likely Exceedance
Blue Highlighting Indicates Value Will Be Recalculated Prior to Removing Carbon Filtration.

TABLE 6
SUMMARY OF SUB-SLAB VAPOR FIELD DATA
PID AND PRESSURE MEASUREMENTS
4300 NE HANCOCK STREET
PORTLAND, OREGON

Monitoring Location	Date	Inf. Pressure ("H ₂ O)	Eff. Pressure ("H ₂ O)	Volume Flow (CFM)	Flow Velocity (FPM)
SSD-1	8/8/2023	-2.5	-0.10	---	---
	8/17/2023	-2.5	-0.10	---	---
	8/24/2023	-2.5	-0.10	---	---
	8/30/2023	-2.5	-0.10	---	---
	9/6/2023	-2.5	-0.09	---	---
	10/4/2023	-2.5	-0.12	---	---
	11/2/2023	-2.5	-0.10	---	---
SSD-2	8/8/2023	-2.5	-0.08	---	---
	8/17/2023	-2.5	-0.08	---	---
	8/24/2023	-2.5	-0.08	---	---
	8/30/2023	-2.5	-0.08	---	---
	9/6/2023	-2.5	334[---	---
	10/4/2023	-2.5	-0.09	---	---
	11/2/2023	-2.5	-0.09	---	---
SSD-3	8/8/2023	-2.5	-0.08	---	---
	8/17/2023	-2.5	-0.08	---	---
	8/24/2023	-2.5	-0.08	---	---
	8/30/2023	-2.5	-0.08	---	---
	9/6/2023	-2.5	-0.08	---	---
	10/4/2023	-2.5	-0.11	---	---
	11/2/2023	-2.5	-0.10	---	---
SSD-4	8/8/2023	-2.5	-0.11	---	---
	8/17/2023	-2.5	-0.11	---	---
	8/24/2023	-2.5	0.09	---	---
	8/30/2023	-2.5	-0.11	---	---
	9/6/2023	-2.5	-0.01	---	---
	10/4/2023	-2.5	-0.12	---	---
	11/2/2023	-2.5	-0.11	---	---
SSD-5	8/8/2023	-2.5	-0.13	---	---
	8/17/2023	-2.5	-0.13	---	---
	8/24/2023	-2.5	-0.13	---	---
	8/30/2023	-2.5	-0.13	---	---
	9/6/2023	-2.5	-0.11	---	---
	10/4/2023	-3	-0.12	---	---
	11/2/2023	-3	-0.11	---	---
SSD-6	8/8/2023	-2.5	-0.13	---	---
	8/17/2023	-2.5	-0.13	---	---
	8/24/2023	-2.5	-0.13	---	---
	8/30/2023	-2.5	-0.13	---	---
	9/6/2023	-2.5	-0.11	---	---
	10/4/2023	-2.5	-0.12	---	---
	11/2/2023	-2.5	-0.11	---	---



**TABLE 6
SUMMARY OF SUB-SLAB VAPOR FIELD DATA
PID AND PRESSURE MEASUREMENTS
4300 NE HANCOCK STREET
PORTLAND, OREGON**

Monitoring Location	Date	Inf. Pressure ("H ₂ O)	Eff. Pressure ("H ₂ O)	Volume Flow (CFM)	Flow Velocity (FPM)
SSD-7	8/8/2023	-2.5	-0.12	---	---
	8/17/2023	-2.5	-0.12	---	---
	8/24/2023	-2.5	-0.12	---	---
	8/30/2023	-2.5	-0.12	---	---
	9/6/2023	-2.5	-0.11	---	---
	10/4/2023	-2.5	-0.12	---	---
	11/2/2023	-2.5	-0.10	---	---
SSD-8	8/8/2023	-2.5	-0.10	---	---
	8/17/2023	-0.10	-0.10	---	---
	8/24/2023	-0.10	-0.10	---	---
	8/30/2023	-0.10	-0.10	---	---
	9/6/2023	-0.03	-0.03	---	---
	10/4/2023	-0.03	-0.03	---	---
	11/2/2023	-2.5	-0.10	---	---
SSD-9	8/8/2023	-2.5	-0.10	---	---
	8/17/2023	-2.5	-0.10	---	---
	8/24/2023	-2.75	-0.10	---	---
	8/30/2023	-2.75	-0.10	---	---
	9/6/2023	-2.75	-0.09	---	---
	10/4/2023	-2.5	-0.11	---	---
	11/2/2023	-2.5	-0.10	---	---
PRE/POST TREATMENT GAC	8/8/2023	-0.16	0.07	42.38	390
	8/17/2023	-0.16	0.07	44.5	410
	8/24/2023	-0.16	0.07	40.88	380
	8/30/2125	-0.15	0.08	58.25	540
	9/6/2023	-0.07	0.08	53.53	500
	10/4/2023	-0.5	0.065	60.73	560
	11/2/2023	-0.13	0.075	63.6	590

TABLE 7
SUMMARY OF SUB-SLAB VAPOR FIELD DATA
PID AND PRESSURE MEASUREMENTS
4300 NE HANCOCK STREET
PORTLAND, OREGON

Monitoring Location	Date	PID Reading (PPM)	Pressure Measurement ("H ₂ O)
SS Fish	8/8/2023	28.6	-0.035
	8/17/2023	25.1	-0.035
	8/24/2023	23.8	-0.05
	8/30/2023	0.0	-0.065
	9/6/2023	0.0	-0.055
	10/4/2023	--	-0.065
	11/2/2023	--	-0.065
SS Gym	8/8/2023	0.0	0.000
	8/17/2023	0.0	0.000
	8/24/2023	0.0	0.000
	8/30/2023	0.0	0.000
	10/4/2023	--	0.000
	11/2/2023	--	0.000
SS Tie's ENE	8/8/2023	0.0	-0.035
	8/17/2023	0.0	-0.035
	8/24/2023	0.0	-0.035
	8/30/2023	0.0	-0.045
	9/6/2023	0.0	-0.03
	10/4/2023	--	-0.04
	11/2/2023	--	-0.04
SS Tie's ESE	8/8/2023	0.0	-0.035
	8/17/2023	0.0	-0.035
	8/24/2023	0.0	-0.03
	8/30/2023	0.0	-0.045
	9/6/2023	0.0	-0.03
	10/4/2023	--	-0.045
	11/2/2023	--	-0.04
SS Tie's NW	8/8/2023	0.0	0.000
	8/17/2023	0.0	0.000
	8/24/2023	0.0	0.010
	8/30/2023	0.0	0.010
	9/6/2023	0.0	0.010
	10/4/2023	--	0.000
	11/2/2023	--	0.000
SS Tie's SE	8/8/2023	0.0	-0.075
	8/17/2023	0.0	-0.075
	8/24/2023	0.0	-0.08
	8/30/2023	0.0	-0.095
	9/6/2023	0.0	-0.05
	10/4/2023	--	-0.100
	11/2/2023	--	-0.100

TABLE 7
SUMMARY OF SUB-SLAB VAPOR FIELD DATA
PID AND PRESSURE MEASUREMENTS
4300 NE HANCOCK STREET
PORTLAND, OREGON

Monitoring Location	Date	PID Reading (PPM)	Pressure Measurement ("H ₂ O)
SS Tie's SW	8/8/2023	0.0	-0.005
	8/17/2023	0.0	-0.005
	8/24/2023	0.0	-0.005
	8/30/2023	0.0	-0.005
	9/6/2023	0.0	-0.01
	10/4/2023	--	-0.005
	11/2/2023	--	0.000



TABLE 8
SUMMARY OF PRE- & POST-TREATMENT SAMPLE ANALYTICAL RESULTS
cVOCs DETECTED BY EPA METHOD TO-15
4300 NE HANCOCK STREET
PORTLAND, OREGON

Matrices: Air

Sample Location			INFLUENT (PRE GAC)					EFFLUENT (POST GAC)					Reference Air Dispersion Value (Calculated Aerscreen Threshold)
Collected By			SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC	SEC		
Date Collected			8/8/2023	8/17/2023	9/6/2023	10/4/2023	11/2/2023	8/8/2023	8/17/2023	9/6/2023	10/4/2023	11/2/2023	
Method	Analyte	Units	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Table 4 Value
TO-15	Tetrachloroethene	ug/m3	100,000 ve	56,000 ve	--	16,000 ve	14,000 ve	43 U	130 U	58 U	62 U	64 U	(Update Pending)
TO-15	Trichloroethene	ug/m3	1200	660	--	210	190	0.69 U	2 U	0.91 U	0.98 U	1.0 U	(Update Pending)
TO-15	1,2-Dichloroethane	ug/m3	2 U	1.9 U	--	0.73 U	0.77 U	0.26 U	0.77 U	0.34 U	0.37 U	0.38 U	--
TO-15	cis-1,2-Dichloroethene	ug/m3	710	600	--	220	380	2.5 U	7.5 U	3.4 U	3.6 U	3.7 U	--
TO-15	trans-1,2-Dichloroethene	ug/m3	19 U	18 U	--	7.1 U	7.5 U	2.5 U	7.5 U	3.4 U	3.6 U	3.7 U	--
TO-15	Vinyl Chloride	ug/m3	13 U	12 U	--	4.6 U	4.9 U	1.6 U	4.9 U	2.2 U	2.3 U	2.4 U	--
TO-15	Chloroform	ug/m3	47	14	--	4.7	--	0.31 U	1.7	0.42 U	0.53	--	--
TO-15	Tetrahydrofuran	ug/m3	140	27 U	--	11 U	--	3.8 U	11 U	5 U	5.4 U	--	--
TO-15	Styrene	ug/m3	390	39 U	--	15 U	--	5.5 U	16 U	7.2 U	7.8 U	--	--
--	PID Field Reading	ug/m3	24.0	17.7	3.1	--	--	40.2	38.4	4.6	--	--	--

Notes:

Bolding indicates analyte detection.

--: not established.

U: Analyte was not detected at a concentration greater than the laboratory reporting limit (shown).

ve: The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

Shading indicates Screening Level Value exceedance.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

5500 4th Avenue South
Seattle, WA 98108
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

November 13, 2023

Andrew Blake, Project Manager
Succeed Environmental Consulting, LLC
1631 NE Broadway 211
Portland, OR 97232

Dear Mr Blake:

Included are the results from the testing of material submitted on November 3, 2023 from the Ties-1, F&BI 311076 project. There are 8 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
SCD1113R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 3, 2023 by Friedman & Bruya, Inc. from the Succeed Environmental Consulting, LLC Ties-1, F&BI 311076 project. Samples were logged in under the laboratory ID's listed below.

<u>Laboratory ID</u>	<u>Succeed Environmental Consulting, LLC</u>
311076 -01	Effluent-110223
311076 -02	Influent-110223
311076 -03	Tie's Rear
311076 -04	Fish Front

The tetrachloroethene concentration in sample Effluent-110223 exceeded the calibration range of the instrument. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Effluent-110223	Client:	Succeed Environmental Consulting, LLC
Date Received:	11/03/23	Project:	Ties-1, F&BI 311076
Date Collected:	11/02/23	Lab ID:	311076-01 1/9.4
Date Analyzed:	11/08/23	Data File:	110729.D
Matrix:	Air	Instrument:	GCMS8
Units:	ug/m3	Operator:	bat

	% Recovery:	Lower Limit:	Upper Limit:
Surrogates:			
4-Bromofluorobenzene	100	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<2.4	<0.94
Chloroethane	<25	<9.4
1,1-Dichloroethene	<3.7	<0.94
trans-1,2-Dichloroethene	<3.7	<0.94
1,1-Dichloroethane	<3.8	<0.94
cis-1,2-Dichloroethene	<3.7	<0.94
1,2-Dichloroethane (EDC)	<0.38	<0.094
1,1,1-Trichloroethane	<5.1	<0.94
Trichloroethene	<1	<0.19
1,1,2-Trichloroethane	<0.51	<0.094
Tetrachloroethene	<64	<9.4

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Influent-110223	Client:	Succeed Environmental Consulting, LLC
Date Received:	11/03/23	Project:	Ties-1, F&BI 311076
Date Collected:	11/02/23	Lab ID:	311076-02 1/19
Date Analyzed:	11/08/23	Data File:	110730.D
Matrix:	Air	Instrument:	GCMS8
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	98	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<4.9	<1.9
Chloroethane	<50	<19
1,1-Dichloroethene	<7.5	<1.9
trans-1,2-Dichloroethene	<7.5	<1.9
1,1-Dichloroethane	<7.7	<1.9
cis-1,2-Dichloroethene	380	96
1,2-Dichloroethane (EDC)	<0.77	<0.19
1,1,1-Trichloroethane	<10	<1.9
Trichloroethene	190	36
1,1,2-Trichloroethane	<1	<0.19
Tetrachloroethene	14,000 ve	2,100 ve

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Tie's Rear	Client:	Succeed Environmental Consulting, LLC
Date Received:	11/03/23	Project:	Ties-1, F&BI 311076
Date Collected:	11/02/23	Lab ID:	311076-03 1/1.5
Date Analyzed:	11/08/23	Data File:	110727.D
Matrix:	Air	Instrument:	GCMS8
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	95	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.23 j	<0.09 j
Chloroethane	<4	<1.5
1,1-Dichloroethene	<0.59	<0.15
trans-1,2-Dichloroethene	<0.59	<0.15
1,1-Dichloroethane	<0.61	<0.15
cis-1,2-Dichloroethene	<0.59	<0.15
1,2-Dichloroethane (EDC)	0.079	0.019
1,1,1-Trichloroethane	<0.82	<0.15
Trichloroethene	<0.16	<0.03
1,1,2-Trichloroethane	<0.082	<0.015
Tetrachloroethene	<6.1 j	<0.9 j

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Fish Front	Client:	Succeed Environmental Consulting, LLC
Date Received:	11/03/23	Project:	Ties-1, F&BI 311076
Date Collected:	11/02/23	Lab ID:	311076-04 1/1.6
Date Analyzed:	11/08/23	Data File:	110726.D
Matrix:	Air	Instrument:	GCMS8
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	92	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.25 j	<0.096 j
Chloroethane	<4.2	<1.6
1,1-Dichloroethene	<0.63	<0.16
trans-1,2-Dichloroethene	<0.63	<0.16
1,1-Dichloroethane	<0.65	<0.16
cis-1,2-Dichloroethene	<0.63	<0.16
1,2-Dichloroethane (EDC)	1.5	0.38
1,1,1-Trichloroethane	<0.87	<0.16
Trichloroethene	<0.17	<0.032
1,1,2-Trichloroethane	<0.087	<0.016
Tetrachloroethene	6.9 j	1 j

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Succeed Environmental Consulting, LLC
Date Received:	Not Applicable	Project:	Ties-1, F&BI 311076
Date Collected:	Not Applicable	Lab ID:	03-2625 mb
Date Analyzed:	11/07/23	Data File:	110712.D
Matrix:	Air	Instrument:	GCMS8
Units:	ug/m3	Operator:	bat

	%	Lower	Upper
Surrogates:	Recovery:	Limit:	Limit:
4-Bromofluorobenzene	93	70	130

Compounds:	Concentration	
	ug/m3	ppbv
Vinyl chloride	<0.16 j	<0.06 j
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<4.1 j	<0.6 j

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 11/13/23

Date Received: 11/03/23

Project: Ties-1, F&BI 311076

**QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES
FOR VOLATILES BY METHOD TO-15**

Laboratory Code: 311076-01 1/9.4 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Vinyl chloride	ug/m3	<2.4	<2.4	nm
Chloroethane	ug/m3	<25	<25	nm
1,1-Dichloroethene	ug/m3	<3.7	<3.7	nm
trans-1,2-Dichloroethene	ug/m3	<3.7	<3.7	nm
1,1-Dichloroethane	ug/m3	<3.8	<3.8	nm
cis-1,2-Dichloroethene	ug/m3	<3.7	<3.7	nm
1,2-Dichloroethane (EDC)	ug/m3	<0.38	<0.38	nm
1,1,1-Trichloroethane	ug/m3	<5.1	<5.1	nm
Trichloroethene	ug/m3	<1	<1	nm
1,1,2-Trichloroethane	ug/m3	<0.51	<0.51	nm
Tetrachloroethene	ug/m3	<64	<64	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Vinyl chloride	ug/m3	35	87	70-130
Chloroethane	ug/m3	36	94	70-130
1,1-Dichloroethene	ug/m3	54	95	70-130
trans-1,2-Dichloroethene	ug/m3	54	100	70-130
1,1-Dichloroethane	ug/m3	55	96	70-130
cis-1,2-Dichloroethene	ug/m3	54	95	70-130
1,2-Dichloroethane (EDC)	ug/m3	55	93	70-130
1,1,1-Trichloroethane	ug/m3	74	110	70-130
Trichloroethene	ug/m3	73	95	70-130
1,1,2-Trichloroethane	ug/m3	74	97	70-130
Tetrachloroethene	ug/m3	92	100	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

- a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.
- b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.
- ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.
- c - The presence of the analyte may be due to carryover from previous sample injections.
- cf - The sample was centrifuged prior to analysis.
- d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.
- dv - Insufficient sample volume was available to achieve normal reporting limits.
- f - The sample was laboratory filtered prior to analysis.
- fb - The analyte was detected in the method blank.
- fc - The analyte is a common laboratory and field contaminant.
- hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.
- hs - Headspace was present in the container used for analysis.
- ht - The analysis was performed outside the method or client-specified holding time requirement.
- ip - Recovery fell outside of control limits due to sample matrix effects.
- j - The analyte concentration is reported below the standard reporting limit. The value reported is an estimate.
- J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.
- jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.
- js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.
- k - The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.
- lc - The presence of the analyte is likely due to laboratory contamination.
- L - The reported concentration was generated from a library search.
- nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.
- pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.
- ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.
- vo - The value reported fell outside the control limits established for this analyte.
- x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

311076

SAMPLE CHAIN OF CUSTODY

11/03/23

Page # 1 of 1

Report To Andrus Blake

Company SEC

Address 1631 NE Broadway #211

City, State, ZIP Portland, OR 97232

Phone 971-371-0467 Email ablake@sec-ed.com

SAMPLERS (signature)

PROJECT NAME & ADDRESS

Tics-1

PO #

NOTES:

INVOICE TO

SEC

TURNAROUND TIME

(Standard) RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Default: Clean following final report delivery Hold (Fee may apply):

SAMPLE INFORMATION

Sample Name	Lab ID	Canister ID	Flow Cont. ID	Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One)	Date Sampled	Initial Vac. ("Hg)	Field Initial Time	Final Vac. ("Hg)	Field Final Time	TO15 Full Scan	TO15 BTEXN	TO15 cVOCs	APH	Helium	Notes
Effluent <u>Effluent</u>	01	2436	304	IA / <u>SG</u>	11/2/23	-30	0940	-8	0945	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			IDS updated per A.B. 11/3/23. ems
Effluent <u>Effluent</u>	02	3432	71	IA / <u>SG</u>		-30	0945	-8	0950	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
<u>Tic's Rear</u>	03	3708	1572	<u>IA</u> / SG		-30	0950	-13	1600						
<u>Fish Front</u>	04	3725	1546	<u>IA</u> / SG			1000	-14	1600						
				IA / SG											
				IA / SG											
				IA / SG											
				IA / SG											

ANALYSIS REQUESTED

Samples received at 21°C

SIGNATURE

Relinquished by:

[Signature]

PRINT NAME

Andrus Blake

COMPANY

SEC

DATE

11/2/23

TIME

13:16

Received by:

[Signature]

Relinquished by:

ANH PHAN

ESB

11/03/23

13:16

Friedman & Bruya, Inc.
5500 4th Avenue South
Seattle, WA 98108
Ph. (206) 285-8282

Fax (206) 283-5044