TETRA TECH

Memo

To:	Stephen Houdek – ACS
Cc:	Chris Bonniwell – Tetra Tech
From:	Connor Lauzon – Tetra Tech
Date:	October 21, 2024
Subject:	Stifel – September 2024 Sub-Slab Soil Gas – BRRTS #02-67-554753

This Technical Memorandum (memo) was prepared by Tetra Tech, Inc. to summarize the September 2024 sub-slab soil gas sampling and compile data from previous sampling conducted thus far at the Stifel office building (Site). The Site is identified in the Wisconsin Department of Natural Resources (WDNR) Bureau of Remediation and Redevelopment Tracking System (BRRTS) as site #02-67-554753.

125 E Water St – Stifel Office Building

Tetra Tech performed the second of three soil gas sampling events at the Site on September 25, 2024, at the request of the Wisconsin Department of Natural Resources (WDNR) and as part of the demonstration that the VMS system installed at the site isn't necessary. The third round of sampling is tentatively scheduled for December 2024.

In September, sub-slab soil gas sampling was performed in a manner consistent with previous sampling events that utilized 6-liter Summa canisters with critical orifice regulators controlling flow to approximately 200 mL/min. Prior to sample collection, each vapor pin location was leak tested via water dam and shut-in test to ensure that indoor air didn't influence sample results. Next, a peristaltic pump was used to purge approximately 1L of sub-slab soil gas from the vapor pin and prime the sample train for sample collection. The Summa canister was then opened and allowed to sample for approximately 30 minutes or until the laboratory recommended minimum canister pressure was achieved. Following sample collection, Tetra Tech shipped the Summa canisters to Eurofins Air Toxics laboratory for analysis of tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2 dichloroethylene, trans-1,2 dichloroethylene, and vinyl chloride. Sample locations are depicted on **Figure 1**.

All analytical results were well below applicable screening criteria during the September 2024 sampling round. There were detections of TCE in at every location, however, none exceeded the VRSL. The highest detected concentration of TCE, 140 µg/m^3 at SG-2, is still less than half the commercial sub-slab VRSL of 290 µg/m^3. There were low level detections of PCE at every sample location as well, ranging from 14 to 93µg/m^3 (SG-2), but they were all typically at least two orders of magnitude below the commercial sub-slab VRSL of 5800 µg/m^3. Cumulative sub-slab soil gas analytical results for the Stifel office building are shown in **Table 1**.

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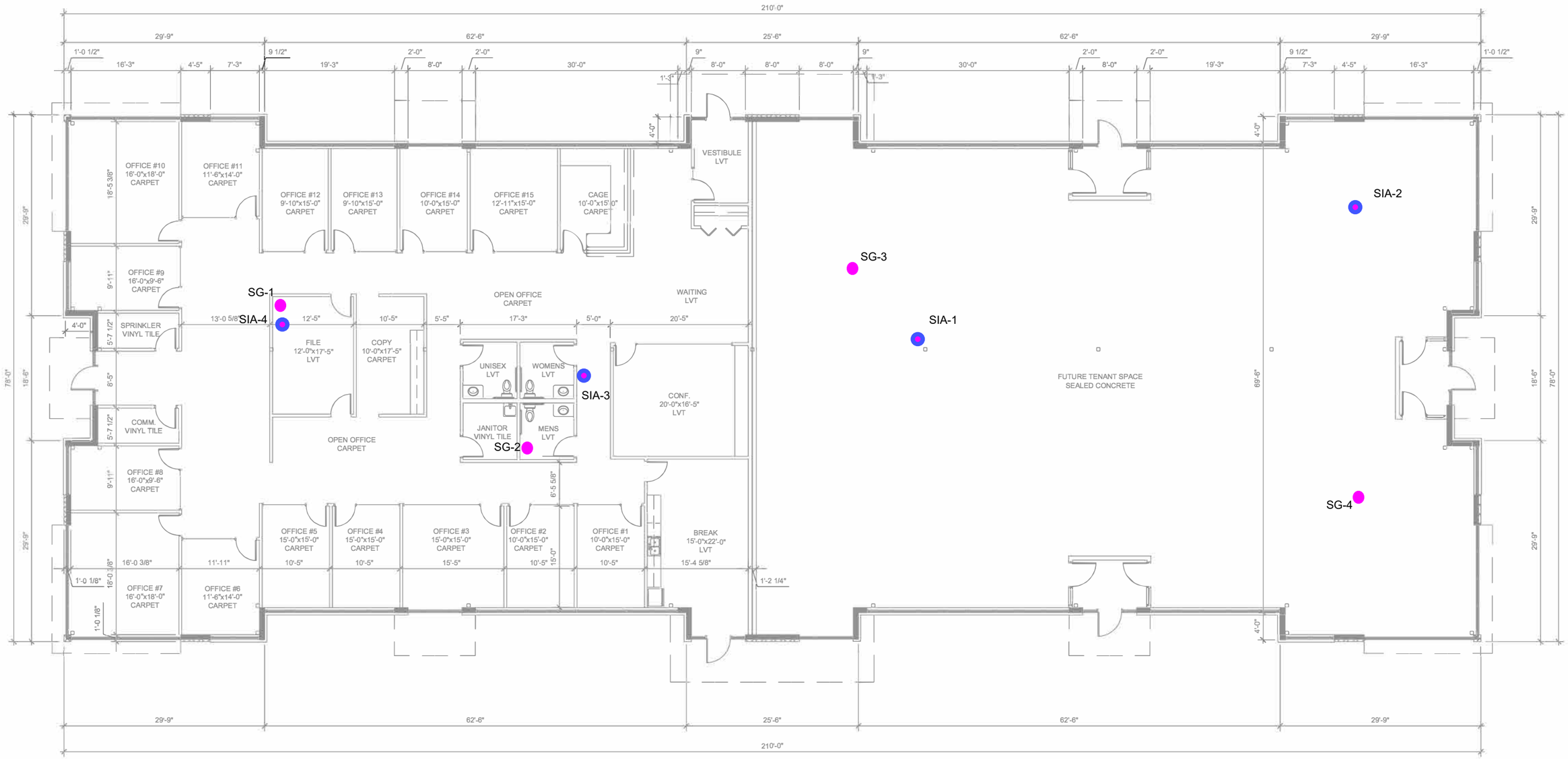
CERTIFICATION

Hydrogeologist:

I hereby certify that I am a hydrogeologist as that term is defined in s. NR712.03(1), Wis. Adm. Code, and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR700 to 726, Wis. Adm. Code.

Connor Lauzon, P.G. 2002-13
Project Manager

FIGURES



LEGEND

SG-1 SOIL GAS SAMPLE LOCATION

SIA-1 INDOOR AIR SAMPLE LOCATION

SCALE

0 30

Feet

TITLE: A-101 OFFICE BUILDING VAPOR PIN LOCATIONS

LOCATION: THE DISTRICT #12, WEST BEND, WISCONSIN

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CHECKED	DLM
DRAFTED	CMP
PROJECT	1321.006
DATE	12-12-19

FIGURE: 1

S:\CAD\CITY OF WEST BEND\DECEMBER 2019\OFFICE A-101 VAPOR PIN LOCATIONS 12-12-19.DWG

TABLES

Table 1 - Cumulative Soil Gas Sampling Results

Stifel Office Building

West Bend, Wisconsin

Sample	Location	Floor	Date	TCE ($\mu g/m^3$)	PCE ($\mu g/m^3$)	Cis ($\mu g/m^3$)	trans ($\mu g/m^3$)	VC ($\mu g/m^3$)
Commercial Sub-Slab VSRL (µg/m3)				**290**	**5800**	**5800**	**5800**	**930**
SG-1	Stifel - File Room	1	5/29/24	33	14	<3.5	<3.5	<2.3
			9/25/24	28	18	<3.4	<3.4	<2.2
SG-2	Stifel - Restroom	1	5/29/24	130	57	<3.5	<3.5	<2.2
			9/25/24	140	93	<3.6	<3.6	<2.3
SG-3	Pediatric Dentist	1	5/29/24	89	10	4	<3.4	<2.2
			9/25/24	120	36	<3.2	<3.2	<2.1
SG-4	Dental Surgeon	1	5/29/24	65	20	<3.3	<3.3	<2.1
			9/25/24	51	17	<3.5	<3.5	<2.3

TCE - Trichloroethylene
PCE - Tetrachloroethylene
Cis - cis-1,2-Dichloroethene
trans - trans-1,2-Dichloroethene
VC - vinyl chloride

Denotes exceedance of Commercial VRSL

Denotes exceedance of 3X Commercial VRSL

ATTACHMENTS

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10/9/2024
Mr. Chris Bonniwell
Tetra Tech
13555 Bishops Ct
Ste 201
Brookfield WI 53005

Project Name: ACS-Stifel
Project #: 117-328416-24011
Workorder #: 2409733

Dear Mr. Chris Bonniwell

The following report includes the data for the above referenced project for sample(s) received on 9/26/2024 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Jade White at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Jade White

Project Manager

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WORK ORDER #: 2409733

Work Order Summary

CLIENT:	Mr. Chris Bonniwell Tetra Tech 13555 Bishops Ct Ste 201 Brookfield, WI 53005	**BILL TO:**	Mr. Chris Bonniwell Tetra Tech 13555 Bishops Ct Ste 201 Brookfield, WI 53005
PHONE:		**P.O. #**	117-328416-24011
FAX:		**PROJECT #**	117-328416-24011 ACS-Stifel
DATE RECEIVED:	09/26/2024	**CONTACT:**	Jade White
DATE COMPLETED:	10/09/2024		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SG-1	TO-15	10.2 "Hg	1.9 psi
02A	SG-2	TO-15	11.2 "Hg	1.9 psi
03A	SG-3	TO-15	9.6 "Hg	1.5 psi
04A	SG-4	TO-15	11 "Hg	1.9 psi
05A	Lab Blank	TO-15	NA	NA
06A	CCV	TO-15	NA	NA
07A	LCS	TO-15	NA	NA
07AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 10/09/24

Technical Director

Cert. No.: AZ Licensure-AZ0775, FL NELAP-E87680, LA NELAP–02089, MN NELAP-2703122, NH NELAP–209223-B, NJ NELAP-CA016, NY NELAP-11291, TX NELAP-T104704434, UT NELAP-CA009332023-16, VA NELAP-12695, WA NELAP-C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) CA300005-20
Eurofins Environment Testing Northern California, LLC certifies that the test results contained in this report meet all requirements of the 2016 TNI Standard.

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.

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(916) 985-1000

LABORATORY NARRATIVE
EPA Method TO-15
Tetra Tech
Workorder# 2409733

Four 6 Liter Summa Canister samples were received on September 26, 2024. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS

Client Sample ID: SG-1

Lab ID#: 2409733-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.86	5.3	4.6	28
Tetrachloroethene	0.86	2.6	5.8	18

Client Sample ID: SG-2

Lab ID#: 2409733-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.90	27	4.8	140
Tetrachloroethene	0.90	14	6.1	93

Client Sample ID: SG-3

Lab ID#: 2409733-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.81	22	4.4	120
Tetrachloroethene	0.81	5.3	5.5	36

Client Sample ID: SG-4

Lab ID#: 2409733-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	0.89	9.5	4.8	51
Tetrachloroethene	0.89	2.5	6.0	17

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Client Sample ID: SG-1

Lab ID#: 2409733-01A

EPA METHOD TO-15 GC/MS

File Name:	**3100815**	**Date of Collection:**	**9/25/24 11:19:00 AM**
Dil. Factor:	**1.71**	**Date of Analysis:**	**10/8/24 11:36 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.86	Not Detected	2.2	Not Detected
cis-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected
Trichloroethene	0.86	5.3	4.6	28
Tetrachloroethene	0.86	2.6	5.8	18
trans-1,2-Dichloroethene	0.86	Not Detected	3.4	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: SG-2

Lab ID#: 2409733-02A

EPA METHOD TO-15 GC/MS

File Name:	**3100816**	**Date of Collection: 9/25/24 11:55:00 AM**	
Dil. Factor:	**1.80**	**Date of Analysis: 10/9/24 12:04 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.90	Not Detected	2.3	Not Detected
cis-1,2-Dichloroethene	0.90	Not Detected	3.6	Not Detected
Trichloroethene	0.90	27	4.8	140
Tetrachloroethene	0.90	14	6.1	93
trans-1,2-Dichloroethene	0.90	Not Detected	3.6	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	96	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: SG-3

Lab ID#: 2409733-03A

EPA METHOD TO-15 GC/MS

File Name:	**3100817**	**Date of Collection: 9/25/24 12:34:00 PM**	
Dil. Factor:	**1.62**	**Date of Analysis: 10/9/24 12:53 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.81	Not Detected	2.1	Not Detected
cis-1,2-Dichloroethene	0.81	Not Detected	3.2	Not Detected
Trichloroethene	0.81	22	4.4	120
Tetrachloroethene	0.81	5.3	5.5	36
trans-1,2-Dichloroethene	0.81	Not Detected	3.2	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	91	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: SG-4

Lab ID#: 2409733-04A

EPA METHOD TO-15 GC/MS

File Name:	**3100818**	**Date of Collection:**	**9/25/24 1:47:00 PM**
Dil. Factor:	**1.78**	**Date of Analysis:**	**10/9/24 01:21 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.89	Not Detected	2.3	Not Detected
cis-1,2-Dichloroethene	0.89	Not Detected	3.5	Not Detected
Trichloroethene	0.89	9.5	4.8	51
Tetrachloroethene	0.89	2.5	6.0	17
trans-1,2-Dichloroethene	0.89	Not Detected	3.5	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2409733-05A

EPA METHOD TO-15 GC/MS

File Name:	**3100806e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/24 11:48 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	89	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: CCV

Lab ID#: 2409733-06A

EPA METHOD TO-15 GC/MS

File Name:	**3100803**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/24 10:29 AM**	

Compound	%Recovery
Vinyl Chloride	96
cis-1,2-Dichloroethene	93
Trichloroethene	97
Tetrachloroethene	102
trans-1,2-Dichloroethene	93

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	90	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCS

Lab ID#: 2409733-07A

EPA METHOD TO-15 GC/MS

File Name:	**3100804**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/24 10:54 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	98	70-130
cis-1,2-Dichloroethene	97	70-130
Trichloroethene	98	70-130
Tetrachloroethene	101	70-130
trans-1,2-Dichloroethene	93	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: LCSD

Lab ID#: 2409733-07AA

EPA METHOD TO-15 GC/MS

File Name:	**3100805**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/24 11:20 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	96	70-130
cis-1,2-Dichloroethene	95	70-130
Trichloroethene	95	70-130
Tetrachloroethene	100	70-130
trans-1,2-Dichloroethene	95	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	104	70-130

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Method : TO-15 (Sh)-c/t-1,2-DCE, PCE, TCE & VC

CAS Number	Compound	Rpt. Limit (ppbv)
75-01-4	Vinyl Chloride	0.50
156-59-2	cis-1,2-Dichloroethene	0.50
79-01-6	Trichloroethene	0.50
127-18-4	Tetrachloroethene	0.50
156-60-5	trans-1,2-Dichloroethene	0.50

	Surrogate	Method Limits
17060-07-0	1,2-Dichloroethane-d4	70-130
2037-26-5	Toluene-d8	70-130
460-00-4	4-Bromofluorobenzene	70-130