



October 23, 2025

Overland Property Group
April Engstrom
5341 West 151st Terrace
Leawood, Kansas 66224

I. Project Identification

Property Address:
301 Cypress Street
Abilene, Taylor County, Texas 79601

Consultant Name and Project Number:

Phase Engineering, LLC
Report # 202510014

II. Property Use

The subject property consists of approximately 0.9704-acre of land and currently consists of an unoccupied multi-story office building and an unoccupied retail storefront and associated parking.

III. Purpose

The purpose of this Vapor Encroachment Screening assessment is to determine if a vapor encroachment condition exists in association with undocumented releases of petroleum products and/or hazardous substances from historical automotive repair, service, and fueling operations and use of gasoline tanks as well as historical cleaning and pressing activities conducted at the subject property.

Assessment activities at the subject property also included conducting a Phase II Environmental Site Assessment (ESA) to evaluate the potential for impact to soil and/or groundwater at the subject property from the identified environmental concerns. The results of that part of the assessment are reported under separate cover.

IV. Background

Phase Engineering, LLC prepared a Phase I Environmental Site Assessment (ESA) for the subject property dated February 5, 2025. The following is a general summary of the findings and opinion associated with the



recognized environmental condition (REC) identified in connection with the subject property during the Phase I ESA:

"Historical street directories and fire insurance maps indicate that businesses conducting automotive service related activities operated at the subject property, including the following:

- *Gasoline filling and service stations were listed at 1037 and 1051 North 4th Street from the mid-1920s to the mid-1930s under the names Cadillac-LaSalle Service and Hollinshead Service Station. The 1925 and 1929 fire insurance maps show gasoline tanks "GTs" at this facility.*
- *A battery service shop was listed at 1031, 1051 & 1053 North 4th Street from the late-1920s to the early-1950s under the name Exide Battery Service.*
- *An automotive service shop was listed at 1051 & 1053 North 4th Street from the early-1940s to the early-1950s under the name Sears Roebuck service department.*
- *An automotive paint and repair shop was listed at 333 Cypress Street during the early-1920s under the name Western Auto Top & Paint Shop.*
- *Automotive sales and rental facilities and taxi and bus services were listed at 357 Cypress Street from the late-1920s to the early-1940s under the names Capital Motor Company, Rent-A-Car Company, City Service Taxi & Bus and Fielder O B & Sons. The 1925 and 1929 fire insurance maps show gasoline tanks "GTs" at this facility.*
- *A gasoline service station was listed at 389 Cypress Street from the mid-1930s to the early-1940s under the names Connally's Service Station and T&P Service Station.*
- *A bus depot was listed at 389 Cypress Street from the mid-1940s to the mid-1950s under the names American Bus Depot, American Bus Lines, Inc. and Continental Trailways. The 1950 fire insurance map shows an oil storage room at this facility.*

USTs operated at the onsite gasoline filling and service stations prior to the promulgation of UST registration and decommissioning requirements. No records were available which could be used to determine the final status or condition of USTs historically active at this property or the results of any release determination investigations possibly conducted in connection with UST decommissioning. This is a significant data gap. Automotive repair shops are known to store, use and dispose of hazardous substances and petroleum products possibly including degreaser solvents, paints, paint thinners, coolants, oil, hydraulic oil, lubricants, gasoline and diesel.

The subject property has likely been impacted as a result of automotive service and fueling operations conducted onsite based on the duration of operations and lack of information regarding any UST decommissioning investigation activities or the final status and condition of historical USTs, which prevents the environmental professional from verifying that investigation of the former UST systems was adequate to discover any releases. This represents a recognized environmental condition."

V. Scope of Assessment

The investigation consisted of installation of five (5) sub-slab vapor monitoring ports within the surface soil interval extending five feet bgs utilizing Direct Push Technology (DPT) with a track-mounted drill rig, set up of one (1) interior ambient air sampling station, and collection of soil vapor and ambient air samples for laboratory analysis on October 9, 2025. The assessment was conducted to evaluate both the potential for future vapor intrusion as well as potential ongoing vapor intrusion into structures at the



subject property in association with undocumented releases of petroleum products and/or hazardous substances from historical onsite operations of environmental concern as described in Sections III and IV. The sample locations are described in Section VI; the locations were selected to ensure evaluation of areas potentially impacted by past releases as well as migration of impact that could result in current and/or future adverse inhalation exposures.

It is the opinion of Phase Engineering, LLC that the scope and character of the environmental report and services, and the investigation performed, were sufficient to justify the conclusions reached in light of the character of the property and the results of tests performed. Phase Engineering, LLC has used methodologies that conform to standards established by the EPA and appropriate state environmental protection agencies under similar budget and time constraints, good and customary practices, and laboratory standards for this kind of work. Soil vapor and ambient air samples collected and analyzed as part of this limited assessment are indicative of the potentially affected area(s) of the subject property.

VI. Vapor Encroachment Screening Assessment Details

Five (5) vapor monitoring ports were installed sub-slab within the surface soil interval extending five feet bgs utilizing DPT via track-mounted drill rig, and (1) ambient air sampling device (summa canister) was set up in an interior location on October 9, 2025. Sample tubing was inserted into each vapor monitoring port and sealed using a concrete slurry; a summa canister was connected to the sealed tubing at each monitoring port. A leak test was conducted prior to sample collection to ensure that a representative sub-slab sample was able to be collected at an appropriate flow rate (leak test SOP with representative photos included in the attachments). All canisters were verified to have equalized to atmospheric conditions. The soil vapor canisters were each allowed to collect air for a six- to ten-minute period and the ambient air summa canister was allowed to collect air for a two- (2)hour period. At the end of the collection periods, the canisters were sealed and shipped for delivery to Enthalpy Labs in Deer Park, Texas for analysis for volatile organic compounds of concern (chlorinated solvents and petroleum products) via EPA Method TO-15. All canisters were tracked by canister serial number for start and stop times and starting and ending pressures for determination of sample volume for each sample.

The sample locations are summarized in the following table:

SUMMARY OF SAMPLE LOCATIONS	
Sample #	Location / Rationale
SV-1	Near northeast corner of subject property / location of historical battery service shop with oil room and proximate to former gasoline filling and service station and associated gas tank
SV-2	East-central portion of subject property, near center of east property boundary / proximate to former automotive sales and service building and former gasoline tank
SV-3	South-central portion of subject property, north exterior of onsite building / evaluation of migration of impact in areas proximate to existing buildings
SV-4	North-central portion of subject property / proximate to cleaning and pressing operations, automotive paint and repair shop, and former gasoline tanks
SV-5	West-central portion of subject property, along west property boundary / proximate to former automotive sales and service and cleaning and pressing operations as well as offsite gasoline tank
AA-1	South-central portion of subject property, interior of existing building / evaluation of migration of impact and potential exposure in existing buildings



Refer to the attached Sample Location Map for depiction of sample locations.

VII. Laboratory Report Review

A review of the laboratory analytical report for quality assurance / quality control indicators reveals that the soil vapor and ambient air data are acceptable and usable for evaluation of vapor intrusion under this assessment. QC sample recoveries were within control limits, and no contaminants were detected in the blank samples. Sample SV-5 was analyzed with a dilution of 3.5 due to suspected high concentrations of non-target analytes; the reported results were not affected as no analytes were detected at concentrations that exceeded the action levels. No anomalies were noted that would affect the outcome of the assessment.

VIII. Findings

The soil vapor and ambient air analytical results were evaluated using the Environmental Protection Agency (EPA) Vapor Intrusion Screening Levels (VISLs) for residential exposure. The VISLs for evaluation of soil vapor are the target sub-slab/near-source soil gas concentrations, while the VISLs for evaluation of ambient air are the target indoor air soil gas concentrations. The VISLs were calculated based on a target hazard quotient (THQ) of 1 for systemic toxicity and a Target Risk of 1×10^{-5} for carcinogenic risk (per TCEQ regulatory guidance – RG-366/TRRP-18). The results were evaluated using the VISLs for unrestricted site use for residential exposure scenarios.

SOIL VAPOR LABORATORY RESULTS

Thirteen (13) volatile organic compound (VOC) constituents, specifically vinyl chloride, 2-butanone, n-hexane, benzene, trichloroethene, cyclohexane, n-heptane, toluene, 2-hexanone, tetrachloroethene, ethylbenzene, m,p-xylenes, and o-xylene, were detected in one or more of the soil vapor samples collected for laboratory analysis. All detected concentrations of these constituents of concern are less than their respective EPA VISLs for target sub-slab/near-source soil gas concentrations for unrestricted site use. The remaining VOC constituents were not detected in any of the soil vapor samples collected for laboratory analysis at concentrations greater than their respective laboratory reporting limits (RLs). The soil vapor analytical results are summarized in Table 1 and are presented in the attached laboratory analytical report.

AMBIENT AIR LABORATORY RESULTS

One (1) VOC constituent, specifically toluene, was detected in the ambient air sample collected for laboratory analysis at a concentration that is less than its EPA VISL for unrestricted site use. The remaining VOC constituents were not detected in the ambient air sample collected for laboratory analysis at concentrations greater than their respective laboratory RLs. The ambient air analytical results are summarized in Table 2 and are presented in the attached laboratory analytical report.



IX. Conclusions and Recommendations

Phase Engineering, LLC is offering the following conclusions and recommendations based on the results of the assessment:

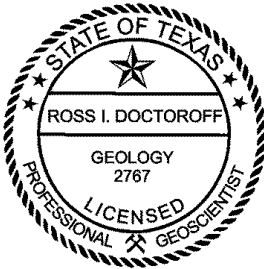
- The assessment results indicate that there is low potential for a vapor encroachment condition resulting in future inhalation exposure under residential exposure scenarios (unrestricted site use) at the subject property, and there is no current vapor intrusion condition that could result in adverse inhalation exposure based on analytical results. **All detected concentrations are less than the most conservative action levels for residential exposure.**
- All soil vapor and ambient air concentrations are less than their respective EPA VISL target concentrations for residential site use; no mitigation plan for vapor intrusion is necessary based on soil vapor and ambient air results.

X. Closing and Signatures

Thank you for using the environmental professional services of Phase Engineering, LLC. If you should have any questions, please contact us at (832) 485-2230.

A handwritten signature in black ink, reading "Ross Doctoroff".

Ross Doctoroff, Texas P.G. #2767
Vice President



A handwritten signature in black ink, reading "Karly E. Allen".

Karly E. Allen, MSPH
Remediation Projects Director

A handwritten signature in black ink, reading "Olivette Sanchez".

Olivette Sanchez
Environmental Project Manager



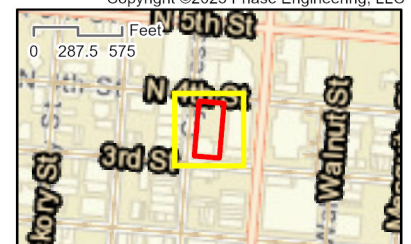
Sources: Esri, HERE, Garmin, (c) OpenStreetMap contributors

0 15 30 60 90 120 Feet
1:700

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Sample Location Map - October 9, 2025

- Subject Property
- ⊕ Soil Vapor Port
- Area of Interest
- ▲ Ambient Air Station



Phase Project No: 202510014

ANALYTICAL RESULTS SUMMARY - VES
301 CYPRESS STREET ABILENE

Table 1: Soil Vapor Analytical Results								
Lab Sample ID			EPA VISL - Residential Exposure	104575-001	104575-002	104575-003	104575-004	104575-005
Client Sample ID			Target Sub-slab / Near-Source	SV-1	SV-2	SV-3	SV-4	SV-5
Date Collected			Soil Gas Concentration	10/9/2025	10/9/2025	10/9/2025	10/9/2025	10/9/2025
Method	Analyte	Units	THQ = 1; TCR = 1E-05	Result	Result	Result	Result	Result
TO-15	Vinyl Chloride	ug/m3	55.9	<0.77	1.3	<0.82	<0.95	<1.8
TO-15	1,1-Dichloroethene	ug/m3	138	<1.2	<1.3	<1.3	<1.5	<2.8
TO-15	trans-1,2-Dichloroethene	ug/m3	1390	<1.2	<1.3	<1.3	<1.5	<2.8
TO-15	Methyl Tert-Butyl Ether (MTBE)	ug/m3	3600	<1.1	<1.2	<1.2	<1.3	<2.5
TO-15	2-Butanone	ug/m3	174000	21	15	11	14	<10
TO-15	cis-1,2-Dichloroethene	ug/m3	1390	<1.2	<1.3	<1.3	<1.5	<2.8
TO-15	n-Hexane	ug/m3	24300	12	22	13	4.8	11
TO-15	Benzene	ug/m3	120	12	28	13	17	6.8
TO-15	Cyclohexane	ug/m3	209000	2.4	4.9	4.9	1.4	<2.4
TO-15	Trichloroethene	ug/m3	69.5	<1.6	<1.8	<1.7	<2.0	15
TO-15	n-Heptane	ug/m3	13900	7.3	16	8.8	5.4	8.0
TO-15	Toluene	ug/m3	174000	19	35	29	19	29
TO-15	2-Hexanone	ug/m3	1040	9.9	6.9	6.0	4.0	<2.8
TO-15	Tetrachloroethene	ug/m3	1390	22	38	4.2	300	180
TO-15	Ethylbenzene	ug/m3	374	8.4	17	20	8.6	5.0
TO-15	m,p-Xylenes	ug/m3	3480	9.8	14	9.4	12	17
TO-15	o-Xylene	ug/m3	3480	4.5	6.1	4.3	5.7	7.6
TO-15	Xylene (total)	ug/m3	3480	14	20	14	18	24

Less than EPA VISL - residential exposure

ANALYTICAL RESULTS SUMMARY - VES
301 CYPRESS STREET ABILENE

Table 2: Ambient Air Analytical Results				
Lab Sample ID			EPA VISL - Residential Exposure	104575-006
Client Sample ID			Target Indoor Air	AA-1
Date Collected			Soil Gas Concentration	10/9/2025
Method	Analyte	Units	THQ = 1; TCR = 1E-05	Result
TO-15	Vinyl Chloride	ug/m3	1.68	<0.72
TO-15	1,1-Dichloroethene	ug/m3	4.13	<1.1
TO-15	trans-1,2-Dichloroethene	ug/m3	41.7	<1.1
TO-15	Methyl Tert-Butyl Ether (MTBE)	ug/m3	108	<1.0
TO-15	2-Butanone	ug/m3	5210	<4.2
TO-15	cis-1,2-Dichloroethene	ug/m3	41.7	<1.1
TO-15	n-Hexane	ug/m3	730	<1.0
TO-15	Benzene	ug/m3	3.6	<0.90
TO-15	Cyclohexane	ug/m3	6260	<0.97
TO-15	Trichloroethene	ug/m3	2.09	<1.5
TO-15	n-Heptane	ug/m3	417	<1.2
TO-15	Toluene	ug/m3	5210	1.7
TO-15	2-Hexanone	ug/m3	31.3	<1.2
TO-15	Tetrachloroethene	ug/m3	41.7	<1.9
TO-15	Ethylbenzene	ug/m3	11.2	<1.2
TO-15	m,p-Xylenes	ug/m3	104	<2.5
TO-15	o-Xylene	ug/m3	104	<1.2
TO-15	Xylene (total)	ug/m3	104	<3.7

Less than EPA VISL - residential exposure



Enthalpy Analytical
931 Seaco Ct.
Deer Park, TX 77536
(281) 984-7021

enthalpy.com

Lab Job Number : 104575
Report Level : II
Report Date : 10/17/2025

Analytical Report *prepared for:*

Jaymi Reser
Phase Engineering
5524 Cornish Street
Houston, TX 77007

Project: Soil Vapor/Ambient Air - 202510014 - 301 Cypress Street; Abilene, TX 79601

Authorized for release by:

Erika Garcia, Project Manager
erika.garcia@enthalpy.com

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the above signature which applies to this PDF file as well as any associated electronic data deliverable files. The results contained in this report meet all requirements of NELAP and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Sample Summary

Jaymi Reser	Lab Job #:	104575
Phase Engineering	Project No:	Soil Vapor/Ambient Air
5524 Cornish	Location:	202510014 - 301 Cypress Street;
Street		Abilene, TX 79601
Houston, TX 77007	Date Received:	10/10/25

Sample ID	Lab ID	Collected	Matrix
SV-1	104575-001	10/09/25 08:55	Air
SV-2	104575-002	10/09/25 10:41	Air
SV-3	104575-003	10/09/25 11:34	Air
SV-4	104575-004	10/09/25 13:55	Air
SV-5	104575-005	10/09/25 13:50	Air
AA-1	104575-006	10/09/25 11:22	Air

Case Narrative

Phase Engineering	Lab Job Number: 104575
5524 Cornish Street	Project No: Soil Vapor/Ambient Air
Houston, TX 77007	Location: 202510014 - 301 Cypress Street; Abilene, TX
Jaymi Reser	79601
	Date Received: 10/10/25

This data package contains sample and QC results for six air samples, requested for the above referenced project on 10/10/25. The samples were received in good condition.

Volatile Organics in Air by MS (EPA TO-15):

- Results for several targets are reported with high bias or possible high bias due to co-elution and other interferences.
- Sample SV-5 was analyzed at a dilution to avoid contamination of the analytical system due to suspected high concentrations of non-target compounds.
- No other analytical problems were encountered.



Air Chain of Custody Record

Lab No:

1025-977-104575

Page:

of

Turn Around Time (rush by advanced notice only)

Standard:

5 Day:

X

3 Day:

2 Day:

1 Day:

Custom TAT:

Enthalpy Analytical - Deer Park

931 Seaco Ct., Deer Park, TX 77536

Phone 281-476-9898

CUSTOMER INFORMATION

Company:

Phase Engineering

Report To:

Jaymi Reser

Email:

jaymi@phaseengineering.com

Address:

300 E Sonterra Blvd, Suite 1140

San Antonio, TX 78258

Phone:

832.485.2245

PROJECT INFORMATION

Name:

Number:

202510014

P.O. #:

202510014

Address:

301 Cypress Street

Abilene, TX 79601

Sampled By:

Jaymi Reser

Special Instructions:

Special list of 17 compounds (from 1,1-Dichloroethene to Vinyl Chloride)

+6 FC +5 Tunny Jo 10-10-25
+1 NURS & Pencil

Notes: AA-1 sat for 2 hrs instead of 1hr

SV-1 + SV-2 controllers showed pressure in PSI instead of Hg

Analysis Requested

Sample ID		Type	Equipment Information			Sampling Information					TO-15 special list										
		(I) Indoor (A) Ambient (SV) Soil Vapor (S) Source	Canister ID	Size (1L, 3L, 6L, 15L)	Flow Controller ID	Sample Collection Date	Sample Start Time	Vacuum Start ("Hg)	Sample End Time	Vacuum End ("Hg)											
1	SV-1	SV	C11229	1.4L	A10490	10/9/25	855	25 psi	903	36 psi	X										
2	SV-2	SV	C11232	1.4L	A10482	10/9/25	1041	9 psi	1047	19 psi	X										
3	SV-3	SV	C11244	1.4L	A10464	10/9/25	1124	30 Hg	1142	4 Hg	X										
4	SV-4	SV	C11202	1.4L	A10476	10/9/25	1355	26 Hg	1401	4 Hg	X										
5	SV-S	SV	C11239	1.4L	A10488	10/9/25	1350	26 Hg	1357	2 Hg	X										
6	AA-1	A	C70488	6L	A70333	10/9/25	1122	27 Hg	1328	0 Hg	X										
7																					
8																					
9																					
10																					

Signature

Print Name

Company / Title

Date / Time

1 Relinquished By:

Jaymi Reser

Jaymi Reser

Phase / Project Mgr

10/9/25 1425

1 Received By:

J. Reser

J. Reser

Enthalpy

10-10-25 10:30

2 Relinquished By:

2 Received By:

OCT 10 '25 AM 10:30

3 Relinquished By:

3 Received By:

Analysis Results for 104575

Jaymi Reser
Phase Engineering
5524 Cornish Street
Houston, TX 77007

Lab Job #: 104575
Project No: Soil Vapor/Ambient Air
Location: 202510014 - 301 Cypress Street:
Abilene, TX 79601
Date Received: 10/10/25

Sample ID: SV-1

Lab ID: 104575-001

Collected: 10/09/25 08:55

Matrix: Air

104575-001 Analyte	Result	Qual	Units	RL	MDL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA TO-15										
Vinyl Chloride	ND		ug/m3	0.77		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
1,1-Dichloroethene	ND		ug/m3	1.2		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
trans-1,2-Dichloroethene	ND		ug/m3	1.2		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
MTBE	ND		ug/m3	1.1		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
2-Butanone	21		ug/m3	4.4		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
cis-1,2-Dichloroethene	ND		ug/m3	1.2		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
n-Hexane	12		ug/m3	1.1		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Benzene	12		ug/m3	0.96		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Cyclohexane	2.4		ug/m3	1.0		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Trichloroethene	ND		ug/m3	1.6		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
n-Heptane	7.3		ug/m3	1.2		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Toluene	19		ug/m3	1.1		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
2-Hexanone	9.9		ug/m3	1.2		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Tetrachloroethene	22		ug/m3	2.0		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Ethylbenzene	8.4		ug/m3	1.3		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
m,p-Xylenes	9.8		ug/m3	2.6		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
o-Xylene	4.5		ug/m3	1.3		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Xylene (total)	14		ug/m3	3.9		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM
Surrogates				Limits						
Bromofluorobenzene	104%		%REC	60-140		1.5	104743	10/14/25 21:35	10/14/25 21:35	ARM

Analysis Results for 104575

Sample ID: SV-2
Lab ID: 104575-002
Collected: 10/09/25 10:41
Matrix: Air

104575-002 Analyte	Result	Qual	Units	RL	MDL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA TO-15										
Vinyl Chloride	1.3		ug/m3	0.87	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
1,1-Dichloroethene	ND		ug/m3	1.3	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
trans-1,2-Dichloroethene	ND		ug/m3	1.3	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
MTBE	ND		ug/m3	1.2	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
2-Butanone	15		ug/m3	5.0	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
cis-1,2-Dichloroethene	ND		ug/m3	1.3	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
n-Hexane	22		ug/m3	1.2	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Benzene	28		ug/m3	1.1	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Cyclohexane	4.9		ug/m3	1.2	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Trichloroethene	ND		ug/m3	1.8	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
n-Heptane	16		ug/m3	1.4	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Toluene	35		ug/m3	1.3	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
2-Hexanone	6.9		ug/m3	1.4	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Tetrachloroethene	38		ug/m3	2.3	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Ethylbenzene	17		ug/m3	1.5	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
m,p-Xylenes	14		ug/m3	3.0	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
o-Xylene	6.1		ug/m3	1.5	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Xylene (total)	20		ug/m3	4.4	1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM	
Surrogates				Limits						
Bromofluorobenzene	103%		%REC	60-140		1.7	104743	10/14/25 22:26	10/14/25 22:26	ARM

Sample ID: SV-3
Lab ID: 104575-003
Collected: 10/09/25 11:34
Matrix: Air

104575-003 Analyte	Result	Qual	Units	RL	MDL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA TO-15										
Vinyl Chloride	ND		ug/m3	0.82	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
1,1-Dichloroethene	ND		ug/m3	1.3	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
trans-1,2-Dichloroethene	ND		ug/m3	1.3	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
MTBE	ND		ug/m3	1.2	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
2-Butanone	11		ug/m3	4.7	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
cis-1,2-Dichloroethene	ND		ug/m3	1.3	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
n-Hexane	13		ug/m3	1.1	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Benzene	13		ug/m3	1.0	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Cyclohexane	4.9		ug/m3	1.1	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Trichloroethene	ND		ug/m3	1.7	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
n-Heptane	8.8		ug/m3	1.3	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Toluene	29		ug/m3	1.2	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
2-Hexanone	6.0		ug/m3	1.3	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Tetrachloroethene	4.2		ug/m3	2.2	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Ethylbenzene	20		ug/m3	1.4	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
m,p-Xylenes	9.4		ug/m3	2.8	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
o-Xylene	4.3		ug/m3	1.4	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Xylene (total)	14		ug/m3	4.2	1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM	
Surrogates				Limits						
Bromofluorobenzene	104%		%REC	60-140		1.6	104743	10/14/25 23:16	10/14/25 23:16	ARM

Analysis Results for 104575

Sample ID: SV-4
Lab ID: 104575-004
Collected: 10/09/25 13:55
Matrix: Air

104575-004 Analyte	Result	Qual	Units	RL	MDL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA TO-15										
Vinyl Chloride	ND		ug/m3	0.95	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
1,1-Dichloroethene	ND		ug/m3	1.5	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
trans-1,2-Dichloroethene	ND		ug/m3	1.5	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
MTBE	ND		ug/m3	1.3	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
2-Butanone	14		ug/m3	5.5	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
cis-1,2-Dichloroethene	ND		ug/m3	1.5	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
n-Hexane	4.8		ug/m3	1.3	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Benzene	17		ug/m3	1.2	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Cyclohexane	1.4		ug/m3	1.3	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Trichloroethene	ND		ug/m3	2.0	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
n-Heptane	5.4		ug/m3	1.5	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Toluene	19		ug/m3	1.4	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
2-Hexanone	4.0		ug/m3	1.5	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Tetrachloroethene	300		ug/m3	2.5	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Ethylbenzene	8.6		ug/m3	1.6	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
m,p-Xylenes	12		ug/m3	3.2	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
o-Xylene	5.7		ug/m3	1.6	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Xylene (total)	18		ug/m3	4.8	1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM	
Surrogates				Limits						
Bromofluorobenzene	78%		%REC	60-140		1.9	104743	10/15/25 00:06	10/15/25 00:06	ARM

Sample ID: SV-5
Lab ID: 104575-005
Collected: 10/09/25 13:50
Matrix: Air

104575-005 Analyte	Result	Qual	Units	RL	MDL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA TO-15										
Vinyl Chloride	ND		ug/m3	1.8	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
1,1-Dichloroethene	ND		ug/m3	2.8	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
trans-1,2-Dichloroethene	ND		ug/m3	2.8	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
MTBE	ND		ug/m3	2.5	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
2-Butanone	ND		ug/m3	10	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
cis-1,2-Dichloroethene	ND		ug/m3	2.8	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
n-Hexane	11		ug/m3	2.4	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Benzene	6.8		ug/m3	2.2	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Cyclohexane	ND		ug/m3	2.4	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Trichloroethene	15		ug/m3	3.7	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
n-Heptane	8.0		ug/m3	2.8	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Toluene	29		ug/m3	2.6	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
2-Hexanone	ND		ug/m3	2.8	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Tetrachloroethene	180		ug/m3	4.7	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Ethylbenzene	5.0		ug/m3	3.0	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
m,p-Xylenes	17		ug/m3	6.0	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
o-Xylene	7.6		ug/m3	3.0	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Xylene (total)	24		ug/m3	9.0	3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM	
Surrogates				Limits						
Bromofluorobenzene	79%		%REC	60-140		3.5	104743	10/15/25 00:52	10/15/25 00:52	ARM

Analysis Results for 104575

Sample ID: AA-1
Lab ID: 104575-006
Collected: 10/09/25 11:22
Matrix: Air

104575-006 Analyte	Result	Qual	Units	RL	MDL	DF	Batch	Prepared	Analyzed	Chemist
Method: EPA TO-15										
Vinyl Chloride	ND		ug/m3	0.72	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
1,1-Dichloroethene	ND		ug/m3	1.1	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
trans-1,2-Dichloroethene	ND		ug/m3	1.1	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
MTBE	ND		ug/m3	1.0	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
2-Butanone	ND		ug/m3	4.2	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
cis-1,2-Dichloroethene	ND		ug/m3	1.1	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
n-Hexane	ND		ug/m3	1.0	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Benzene	ND		ug/m3	0.90	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Cyclohexane	ND		ug/m3	0.97	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Trichloroethene	ND		ug/m3	1.5	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
n-Heptane	ND		ug/m3	1.2	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Toluene	1.7		ug/m3	1.1	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
2-Hexanone	ND		ug/m3	1.2	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Tetrachloroethene	ND		ug/m3	1.9	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Ethylbenzene	ND		ug/m3	1.2	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
m,p-Xylenes	ND		ug/m3	2.5	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
o-Xylene	ND		ug/m3	1.2	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Xylene (total)	ND		ug/m3	3.7	1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM	
Surrogates				Limits						
Bromofluorobenzene	105%		%REC	60-140		1.4	104743	10/15/25 03:23	10/15/25 03:23	ARM

ND Not Detected

Batch QC

Type: Blank	Lab ID: QC117009	Batch: 104743
Matrix: Air	Method: EPA TO-15	

QC117009 Analyte	Result	Qual	Units	RL	MDL	Prepared	Analyzed
Vinyl Chloride	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
1,1-Dichloroethene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
trans-1,2-Dichloroethene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
MTBE	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
2-Butanone	ND		ppbv	1.0		10/14/25 13:34	10/14/25 13:34
cis-1,2-Dichloroethene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
n-Hexane	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
Benzene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
Cyclohexane	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
Trichloroethene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
n-Heptane	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
Toluene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
2-Hexanone	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
Tetrachloroethene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
Ethylbenzene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
m,p-Xylenes	ND		ppbv	0.40		10/14/25 13:34	10/14/25 13:34
o-Xylene	ND		ppbv	0.20		10/14/25 13:34	10/14/25 13:34
Xylene (total)	ND		ppbv	0.60		10/14/25 13:34	10/14/25 13:34
Surrogates				Limits			
Bromofluorobenzene	106%		%REC	70-130		10/14/25 13:34	10/14/25 13:34

Type: Lab Control Sample	Lab ID: QC117010	Batch: 104743
Matrix: Air	Method: EPA TO-15	

QC117010 Analyte	Result	Spiked	Units	Recovery	Qual	Limits
Vinyl Chloride	8.263	10.28	ppbv	80%		70-130
1,1-Dichloroethene	9.543	10.34	ppbv	92%		70-130
trans-1,2-Dichloroethene	9.639	10.58	ppbv	91%		70-130
MTBE	10.32	10.50	ppbv	98%		70-130
2-Butanone	9.961	10.47	ppbv	95%		70-130
cis-1,2-Dichloroethene	10.05	10.33	ppbv	97%		70-130
n-Hexane	9.645	10.48	ppbv	92%		70-130
Benzene	9.549	10.31	ppbv	93%		70-130
Cyclohexane	10.18	10.52	ppbv	97%		70-130
Trichloroethene	10.99	10.44	ppbv	105%		70-130
n-Heptane	10.25	10.48	ppbv	98%		70-130
Toluene	10.16	10.35	ppbv	98%		70-130
2-Hexanone	9.966	10.42	ppbv	96%		70-130
Tetrachloroethene	11.05	10.31	ppbv	107%		70-130
Ethylbenzene	11.57	10.38	ppbv	111%		70-130
m,p-Xylenes	22.71	20.76	ppbv	109%		70-130
o-Xylene	11.56	10.31	ppbv	112%		70-130
Surrogates						
Bromofluorobenzene	4.413	4.212	ppbv	105%		70-130

Batch QC

Type: Lab Control Sample Duplicate	Lab ID: QC117011	Batch: 104743
Matrix: Air	Method: EPA TO-15	

QC117011 Analyte	Result	Spiked	Units	Recovery	Qual	Limits	RPD	RPD Lim
Vinyl Chloride	7.929	10.28	ppbv	77%		70-130	4	25
1,1-Dichloroethene	9.426	10.34	ppbv	91%		70-130	1	25
trans-1,2-Dichloroethene	9.542	10.58	ppbv	90%		70-130	1	25
MTBE	10.27	10.50	ppbv	98%		70-130	1	25
2-Butanone	9.973	10.47	ppbv	95%		70-130	0	25
cis-1,2-Dichloroethene	10.02	10.33	ppbv	97%		70-130	0	25
n-Hexane	9.582	10.48	ppbv	91%		70-130	1	25
Benzene	9.573	10.31	ppbv	93%		70-130	0	25
Cyclohexane	10.26	10.52	ppbv	98%		70-130	1	25
Trichloroethene	11.16	10.44	ppbv	107%		70-130	2	25
n-Heptane	10.33	10.48	ppbv	99%		70-130	1	25
Toluene	10.31	10.35	ppbv	100%		70-130	1	25
2-Hexanone	10.16	10.42	ppbv	97%		70-130	2	25
Tetrachloroethene	11.25	10.31	ppbv	109%		70-130	2	25
Ethylbenzene	11.73	10.38	ppbv	113%		70-130	1	25
m,p-Xylenes	23.16	20.76	ppbv	112%		70-130	2	25
o-Xylene	11.77	10.31	ppbv	114%		70-130	2	25
Surrogates								
Bromofluorobenzene	4.437	4.212	ppbv	105%		70-130		

ND Not Detected

Phase Engineering, LLC Standard Operating Procedure (SOP)**Vapor Encroachment Screening – Leak Test and Supply List****Supply List:**

- Steel toe boots
- Hearing protection
- Safety glasses
- Nitrile gloves
- Winching wires
- Extension cords
- Hammer Drill
- Drill bits (multi-length) (verify drill compatibility)
- Vapor Pin set with seals and hand tools
- Hammer
- Chain of Custody for Samples
- Field Notebook
- Poly-tubing
- Leak-test kit (syringe & junction valve)
- Decontamination equipment (brush, bucket, &alconox)
- Flex-tubing
- Control valve(s) (calibrated properly for correct collection time)
- Summa cannister(s)
- Wrench (9/16")
- Quick Cement
- Trowel

DOCUMENT ALL PROCEDURES COMPLETED WITH TIMESTAMPS WITHIN FIELD NOTEBOOK**Preparation for Sampling (document times where (*)):**

1. Verify areas of concern
2. Clear work area of any obvious subsurface features (visual indications and winching wires)
3. Confirm sample locations with property owner*
4. Verify that sample area will stay clear during drilling and sample collection period
5. Photograph general area(s) of sample collection

Drilling and Sampling (document times where (*)):

6. Begin drilling with short 24" drill bit (See *Image 1*)*
7. Ream hole as you drill
8. Penetrate hole with long 39" drill bit (See *Image 2*)
9. Begin vacuuming/sweeping soil cuttings to prevent from entering hole (See *Image 3*)
10. Brush the hole with decontaminated wire brush and vacuum accumulated debris
11. Place new silicone seal on vapor pin
12. Place vapor pin into hand tool (See *Image 4*)
13. Hammer vapor pin into hole using hand tool and hammer until silicone bulges (See *Image 5*)*
14. Cut new 3 feet of poly-tubing
15. Connect poly-tubing to vapor pin using flex tubing (See *Image 6*)
16. Connect new syringe to junction valve
17. Connect junction valve port to new 3 feet of poly tubing using new flex tubing (See *Image 7*)
18. Connect new poly line to control flow valve using nut and ferrule (HAND TIGHTEN ONLY) (See *Image 8*)

19. Connect straight end of junction valve to poly line in ground/vapor pin
20. Photograph tube/sample assembly
21. Leak test: Pull syringe back with valve turned to the flow valve and then to the vapor pin*
 - a. Poly to vapor pin should offer no resistance
 - b. Poly to control valve should offer resistance
 - c. If leak test fails, reinstalling the vapor pin with new silicone seal and new polyline may be necessary
 - d. See "Leak Testing" discussion on Page 3
22. Purge dead space in hole
 - a. Collect a syringe-full of air from hole, and expel the air out of the hole. Repeat.
23. Connect control valves to cannister using 9/16" wrench
24. Open control valve to cannister (note time)*
 - a. Flow valve should read 25-30 hg (See *Image 8*)
25. Note serial numbers (See *Image 9* and *Image 10*) and pressures of flow valves and cannister with location descriptions
26. Double check connections, mitigate tripping hazards, clearly mark area (cone) if necessary
27. Photograph cannister and valve serial numbers and overall sample area

Completion of Sampling (document times where (*)):

28. Check pressure reading on valve
 - a. Valve should read between 0-5 hg before ending sampling
29. Close flow valve if sufficient sample has been collected*
30. Photograph pressure valve reading
31. Disconnect and throw away poly-line, connector tubing, and syringe
32. Store nut and ferrule
33. Disconnect control valves from cannister and store in lab provided boxes
34. Use hand tool to remove vapor pin from surface
35. Throw away silicone sleeve
36. Fill in hole with quick concrete and patch back to surface*
37. Photograph sealed sample location
38. Return cleared sample area to original state
39. Complete laboratory chain of custody and verify that appropriate constituents have been properly selected
40. Package and deliver cannister(s) and valve(s) to laboratory (delivery varies from lab to lab)

Return to Office:

41. Unload all equipment and supplies
42. Clean supplies as needed
43. Save photographs to project file
44. Scan field notes and save file in project folder
45. Prepare sample location map

Leak Testing:

When quantitative soil vapor data are desired (such as for risk assessments), leak testing the system as a quality assurance measure is strongly recommended and required by many state agencies. Leaks in the sampling train or leaks of ambient air into the probe tubing can result in diluting the soil vapor samples with ambient air and will result in underestimating actual contaminant concentrations in subsurface soil gas. Excessive vacuum conditions resulting from low porosity soils or high moisture content soils may exacerbate the potential for ambient air leakage. Two methods of leak detection are recommended: (1) performing a “shut-in” test of the sampling train and applying a leak detection compound or water to the vapor probe at the surface or (2) applying a tracer gas over the probe and over the entire sampling apparatus. Review any local VI sampling guidance for specific requirements for leak testing.

Appendix



Image 1 – Initial drilling activities



Image 2 – Drilling with longer drill bit



Image 3 – Clear and sweep/vacuum sample area



Image 4 – Vapor pin assembly



Image 5 – Installation of vapor pin



Image 6 – Connection of tubing to vapor pin



Image 7 – Set up leak-test assembly



Image 8 – Initial pressure check



Image 9 – Female connection and valve S/N



Image 10 – Location of cannister ID number



Image 11 – Full sample assembly