State of Wisconsin
Department of Natural Resources
PO Box 7921, Madison WI 53707-7921
dnr.wi.gov

Site Investigation Sample Results Notification

Form 4400-249 (R 03/14)

Notice: This form may be used to comply with the requirements of s. NR 716.14 (2), Wis. Adm. Code; however, use of this form is not required. An alternate format may be used. The rule requires that notification be provided to 1) property owners when someone else is conducting the sampling, 2) to occupants of property belonging to the responsible person, and 3) to owners and occupants of property that does not belong to the responsible person but has been affected by contamination arising on his or her property. Notification is required within 10 business days of receiving the sample results. Personal information collected will be used for program administration and may be provided to requesters to the extent required by Wisconsin's Open Records law [ss. 19.31-19.39, Wis. Stats.].

NOTE: Under s. NR 716.14, Wis. Adm. Code, the responsible party must also submit sample results and other required information to the DNR. We recommend that copies of the sample results notifications be included with that submittal, along with all attachments. Using the same format used for data presentation for a closure request may be helpful to all parties. See s. NR 716.14, Wis. Adm. Code for the full list of information to be submitted to the DNR.

Notification of Property Owners and Occupants:

This notification form has been provided to you in order to provide the results of environmental sampling that has been conducted on property that you own or occupy. Samples were collected in accordance with the methods identified in the site investigation work plan, in accordance with s. NR. 716.09 and 716.13, Wis. Adm. Code. This sampling was conducted as a result of contamination originating at the following location.

Site Information

Site Name		DNR ID # (BRRTS #)	
Enbridge Line 13 Blackhawk Valve		02-28-586199	
Address	**City**	**State**	**ZIP Code**
Blackhawk Island Road	Fort Atkinson	WI	53538

Responsible Party

The person(s) responsible for completing this environmental investigation is:

Property Owner

Enbridge Energy, Limited Partnership (Responsible Party / Operator) Tri-State Holdings LLC (property owner)

Address	City	State	ZIP Code
11 East Superior Street - Suite 125	Duluth	MN	55802

Contact Person	Phone Number (include area code)
Karl Beaster, P.G.	(715) 718-1040

Person or company that collected samples

WSP USA Inc.

Sample Results (Results Attached)

Reason for Sampling: ○ Routine ◉ Other (define) SVE Pilot Test

The contaminants that have been identified at this time on property that you own or occupy include:

Contaminant	In Soil? Yes	In Soil? No	In Groundwater? Yes	In Groundwater? No
Gasoline	○	○	○	○
Diesel or Fuel Oil	○	○	○	○
Solvents	○	○	○	○
Heavy Metals	○	○	○	○
Pesticides	○	○	○	○
Other: diluent liquid	◉	○	◉	○

This sampling event included sampling of a drinking water well.
○ Yes ◉ No

If yes, the sampled drinking water well had detectable contaminants.
○ Yes ○ No

Contaminants in Vapor	Yes	No
Indoor Air	○	○
Sub-slab	○	○
Exterior Soil Gas	◉	○

Attached are:

- A map that shows the locations from which samples were collected. (The map needs to meet the requirements of s. NR 716.15 (4), Wis. Adm. Code.)
- A data table with specific contaminant levels at each sample location and whether or not the sample results exceed state standards.
- A copy of the laboratory results.

You are not identified as the person that is responsible for this contamination. However, your cooperation is important. Property owners may become legally responsible for contamination if they do not allow access to the person that is responsible so that person may complete the environmental investigation and clean up activities.

Option for written exemption: You have the option of requesting a written liability exemption from the DNR for contamination that originated on another property, or on property that you lease. To do this, you must present an adequate environmental assessment of your property and pay a $700 fee for review of this information. If you are interested in this option, please see DNR publication # RR 589, "When Contamination Crosses a Property Line - Rights and Responsibilities of Property Owners", available at: dnr.wi.gov/files/PDF/pubs/rr/rr589.pdf.

Contact Information

Please address questions regarding this notification, or requests for additional information to the contact person listed above, or to one of the following contacts:

Environmental Consultant

Company Name	Contact Person Last Name	First Name
WSP USA Inc.	Huff	Tim

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5957 McKee Road, Suite 7	Madison	WI	53719

Phone # (inc. area code)	Email
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Select which agency: (●) Natural Resources ( ) Agriculture, Trade and Consumer Protection

State of Wisconsin Department of Natural Resources

Contact Person Last Name	First Name	Phone # (inc. area code)
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Email

caroline.rice@wisconsin.gov

ENBRIDGE LINE 13 MP 312 VALVE SITE

SOIL VAPOR EXTRACTION PILOT TEST REPORT

ENBRIDGE ENERGY, LIMITED PARTNERSHIP

PROJECT NO.: 31401967.705B
DATE: OCTOBER 2022

WSP USA, INC.
5957 MCKEE ROAD, SUITE 7
MADISON, WI 53719

WSP.COM

CERTIFICATION

Soil Vapor Extraction Pilot Test Report
Enbridge Line 13 MP 312 Valve Site
Blackhawk Island Road
Fort Atkinson, Wisconsin
BRRTS Number: 02-28-586199

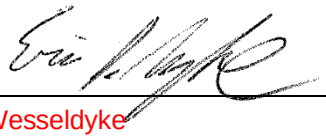
I, Craig R. Anderson, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; 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. NR 700 to 726, Wis. Adm. Code.

Craig Anderson, PE
Practice Leader, Wisconsin PE #35076-6

10/12/2022
Date

SIGNATURES

PREPARED BY



Eric Wesseldyke
Senior Consultant, Environmental Engineer

REVIEWED BY

Craig Anderson, PE
Practice Leader

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1 INTRODUCTION

On behalf of Enbridge Energy, Limited Partnership (Enbridge), WSP USA, Inc. (WSP) has prepared this Soil Vapor Extraction (SVE) Pilot Test Report for the Enbridge Line 13, Mile Post (MP) 312 Valve Site near Fort Atkinson, Wisconsin (Site). Soil and groundwater assessment and remediation are being conducted at the Site under the oversight of the Wisconsin Department of Natural Resources (WDNR) Remediation and Redevelopment Program (Bureau for Remediation and Redevelopment Tracking System (BRRTS) Number: 02-28-586199).

1.1 SVE PILOT TEST RATIONALE

Enbridge submitted to the WDNR a Supplemental Site Investigation (SSI) Report on March 16, 2022, summarizing the results of the additional Site investigation and interim actions conducted in 2021 and January 2022. WSP then submitted a Remedial Action Options Report (RAOR) on May 19, 2022, in accordance with Wisconsin Administrative Code (WAC) Chapter NR 722 requirements, evaluating multiple remedial action options (RAOs) and selecting the RAO most appropriate for this Site. The RAOR identified SVE as the active RAO most appropriate for remediating residual product and soil impacts at the Site. WSP conducted an SVE Pilot Test in accordance with the SVE Pilot Test Work Plan (Work Plan) submitted to the WDNR on July 7, 2022, to collect site-specific data needed to design and implement a full-scale SVE system at the Site.

1.2 SITE GEOLOGY AND HYDROGEOLOGY

Section 2.2 of the SSI Report provides a detailed summary of the Site's setting, including the topography, geology, hydrogeology, and groundwater use. The surficial geology of the Site consists of silty clay and silty sand units from the ground surface to as deep as 10 to 20 feet below ground surface (feet bgs), underlain by fine- to coarse-grained sand with varying amounts of gravel to at least 80 feet bgs. Several thin, discontinuous lenses of silty sand with gravel or sandy silt with gravel were identified between 40 and 55 feet bgs in the boreholes for several deep monitoring wells.

1.3 SVE PILOT TEST TECHNICAL APPROACH AND OBJECTIVES

The primary objective for the SVE pilot test is to determine the feasibility and efficiency of removing petroleum volatile organic compounds (VOCs) from the soil vapor using SVE. SVE involves applying vacuum to the subsurface to promote the flow of soil vapor toward dedicated extraction wells, which capture the vapor-phase VOCs and removes them from the subsurface for subsequent treatment. Critical evaluation and full-scale design parameters that will be determined from the pilot test include:

- Vapor flow characteristics within the unsaturated unconsolidated soils
- Applied vacuum to vapor flow rate relationship
- Achievable soil vapor VOC mass extraction rates
- Achievable vapor extraction radius of influence (ROI)
- Determination of other site-specific conditions that may affect the design and cost of a full-scale SVE system.

2 PILOT TEST PROCEDURES

2.1 GENERAL

The SVE pilot test was conducted from August 9 through 11, 2022. The SVE pilot test evaluated the site-specific vacuum response of the subsurface by applying vacuum to a test extraction well (RW-07) using a vacuum blower. During the vacuum extraction, subsurface vacuum was measured at discrete monitoring points located at incremental distances from the test extraction well to estimate the effective ROI around the test extraction well. In addition, samples of the extracted soil vapor were collected for laboratory analysis to evaluate the VOC vapor mass removal rate achieved over the period the vacuum was applied.

The test was performed in the following phases:

- Stepped-rate test
- Constant-rate test

2.1.1 SVE STEPPED-RATE TEST

The stepped-rate test identifies the optimum applied vacuum that achieves the greatest VOC mass removal per volume with the largest ROI. The stepped-rate test consists of applying incremental vacuum levels on the test extraction well and measuring the stabilized vapor flowrate and subsurface vacuum levels corresponding to each applied vacuum level. The results of the stepped-rate test are used to select the optimum vacuum level and flow rate for the constant rate test. The stepped-rate test was conducted in three steps over the course of approximately 4 hours.

2.1.2 SVE CONSTANT-RATE TEST

The constant-rate test evaluates the subsurface response to long-term vacuum extraction by applying the optimum vacuum level and flow rate at the test extraction well, as identified during the stepped-rate test, until subsurface conditions equilibrate. Data derived from the constant-rate test are used for selection of extraction equipment, selection of treatment equipment, and determination of effective ROI.

Vacuum levels at the extraction well and each monitoring point, as well as the sustained vapor extraction flow rate, were measured at periodic intervals to evaluate the response trends over time. Samples of the extracted vapor were also collected for laboratory analysis to calculate the rate of VOC extraction from the subsurface. The constant rate test was conducted over an approximately 23-hour period.

2.2 SOIL VAPOR SAMPLE COLLECTION AND ANALYSIS

Three vapor samples of the extracted vapor were collected during the constant-rate test. The samples were collected from a sample port located at the inlet of the vapor-liquid separator (VLS) prior to any dilution for quantitative laboratory analysis of VOCs. The vapor samples were collected using 1-liter Summa™ canisters and submitted to ALS Environmental of Cincinnati, Ohio, for laboratory analysis of U.S. Environmental Protection Agency (US EPA) Air Analysis Method TO-15 for VOCs. The samples were collected near the start of the constant-rate test (sample “SVE-1”), approximately halfway through the constant-rate test (sample “SVE-2”), and at the end of the constant-rate test (sample “SVE-3). The extracted vapor was also monitored with a photoionization detector (PID) at routine intervals to evaluate VOC concentration trends over time.

2.3 MANAGEMENT OF TREATMENT RESIDUALS

The effluent treatment process also generated spent granular activated carbon (GAC) media. The spent GAC media was containerized on Site in Department of Transportation -rated 55-gallon drums. WSP collected a sample of the GAC material for waste characterization and off-site disposal.

The Site is currently registered as a Small Quantity Generator (SQG) of hazardous waste with generator EPA ID number WIR000177691 and FID number 128136140.

3 SVE PILOT TEST WELLS AND EQUIPMENT

3.1 GENERAL

The following sections describe the wells, equipment, and instrumentation that were used during the SVE pilot test. Figure 1 presents a layout of the pilot test wells and Figure 2 provides a conceptual process flow diagram of the pilot test system along with a cross section of the test area.

3.2 PILOT TEST EXTRACTION WELL AND MONITORING POINTS

WSP selected the pilot test area near Remediation Well RW-07, which is located within 10 feet of the Line 13 valve. As described in Section 3.2 of the SSI Report, the measured Ultra-Violet Optical Screening Tool (UVOST) response indicated a residual product layer greater than three feet thick near the water table in the vicinity of RW-07 (Figure 2). After installation of RW-7 in June 2021, measured free product thickness in the well was approximately two feet. As a result of product recovery activities and seasonal changes in groundwater elevation, the measured free product thickness in RW-7 in April through June 2022 was less than 0.2 feet. In addition to residual product accumulation near the water table, vadose zone soil sampling results at soil borings in the vicinity of RW-7 indicated shallow soil impacts at depths between approximately 9 and 22 feet below ground surface (bgs) with elevated VOC concentrations in the interval between approximately 15 and 17 feet bgs.

3.2.1 PILOT TEST EXTRACTION WELL

WSP used RW-07 as the extraction well for the SVE pilot test. RW-07 is screened from 17 to 32 feet bgs, with a static water level of approximately 25 feet bgs, providing approximately 8 feet of exposed screen in the lower vadose zone where residual product is observed.

3.2.2 MONITORING POINTS

Subsurface vacuum influence was monitored via existing and newly installed monitoring points located at incremental distances from the SVE pilot test well. The vacuum was monitored at the existing remediation and monitoring wells at distances ranging from approximately 15 feet to 60 feet from the vapor extraction well, RW-07. The remediation and monitoring wells are screened at a depth intersecting the static water table. Three additional shallow vacuum monitoring points (VMPs) were installed adjacent to existing remediation wells RW-06, RW-09, and RW-11 to evaluate the vertical vacuum influence in the subsurface at varying distances from the extraction well. The monitoring points are shown in Figure 1 and summarized in Table 3.1 below. The shallow VMPs were installed using 1” Schedule 40 PVC casing from the ground surface to 7 ft bgs and Schedule 40, 0.010 slotted PVC screen from 7 ft bgs to 10 ft bgs. The borehole was backfilled with sand filter pack from the bottom of the borehole to 6 ft bgs and hydrated bentonite seal from 6 ft bgs to the ground surface. The shallow VMPs were completed with flush mount casing in a 2 ft by 2 ft concrete pad.

Table 3-1: SVE Vapor Monitoring Points

MONITORING POINT	APPROXIMATE DISTANCE	SCREEN INTERVAL
RW-06	14.6 ft	17 to 32 ft bgs
VMP-06	14.4 ft	7 to 10 ft bgs
RW-05	17.7 ft	17 to 32 ft bgs
RW-09	20.6 ft	17 to 32 ft bgs
VMP-09	20.4 ft	7 to 10 ft bgs
RW-03	26.3 ft	17 to 32 ft bgs
RW-01	33.2 ft	17 to 32 ft bgs
RW-11	43.6 ft	17 to 32 ft bgs
VMP-11	43.8 ft	7 to 10 ft bgs
MW-01-32	51.4 ft	22 to 32 ft bgs
MW-14-31	59.6 ft	21 to 31 ft bgs

3.3 SVE EQUIPMENT

WSP rented a pre-assembled SVE equipment skid from Fliteway Technologies, Inc. to perform the SVE pilot test. The skid was equipped with a 7.5 horsepower FPZ K08-MS regenerative blower capable of producing up to 381 cubic feet per minute of airflow and 68 inches of water column vacuum. The equipment skid also contained ancillary SVE equipment including the following:

- 82-gallon vapor liquid separator (VLS) for capturing water vapor entrained within the vapor stream
- Dilution air intake for optimizing the performance of the blower and adjusting the applied vacuum to the extraction well
- Particulate air filter to remove dust and debris from the vapor stream before entering the blower
- Electrical control panel with process logic to automatically shut-down the system in the event of an alarm condition (i.e., high water level in the VLS)
- Vapor transfer hose and fittings to connect the SVE equipment to the extraction wellhead.

A portable diesel generator set was also rented by WSP to provide a temporary source of electricity to the SVE skid for the duration of the test.

3.4 PILOT TEST INSTRUMENTATION

Instrumentation used during the pilot test included vacuum, flow, and temperature indicators at the locations illustrated in Figure 2. Extracted soil vapor VOC concentrations were monitored with a PID. VOC concentrations in the extracted soil vapor were also evaluated quantitatively by collecting samples for laboratory analysis near the beginning, middle, and end of the constant-rate test.

4 TEST DATA EVALUATION

The following sections contain WSP's evaluation of the data collected during the SVE pilot test.

4.1 APPLIED VACUUM – FLOW RESPONSE

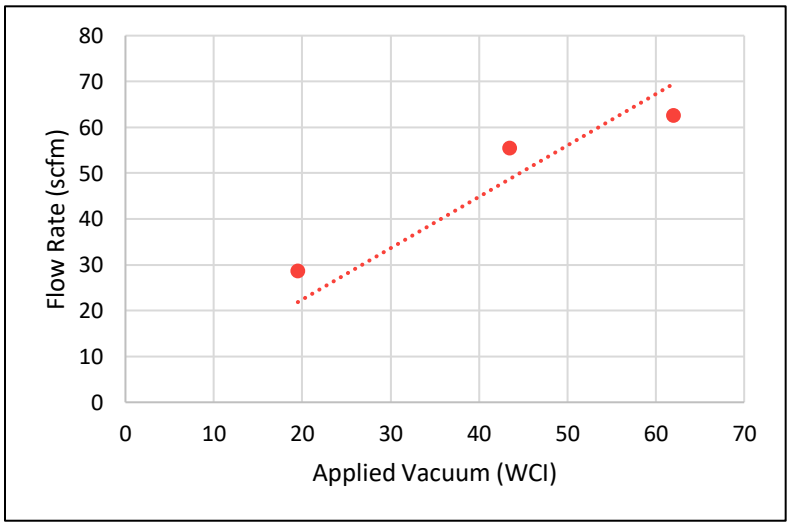
4.1.1 STEPPED-RATE TEST

Table 4-1 and Figure 4-1 below depict the site-specific response of the vapor flow rate to the applied vacuum using data generated from the SVE stepped-rate test. The collected data from the stepped-rate test is summarized in the field data sheet in Appendix A. The SVE stepped-rate test was completed in three steps, with incrementally increasing extraction wellhead applied vacuum levels of approximately 20, 44, and 62 inches of water column (WCI). An additional step was attempted with an applied vacuum of approximately 84 WCI. However, the blower on the SVE system was unable to sustain operation applying that vacuum to the wellhead.

Table 4-1: Applied Vacuum and Flow Rate (Stepped-Rate Test)

APPLIED VACUUM	FLOW RATE
19.5 WCI	28.7 SCFM
43.5 WCI	55.5 SCFM
62 WCI	62.6 SCFM

Figure 4-1: Applied Vacuum and Flow Rate (Stepped-Rate Test)

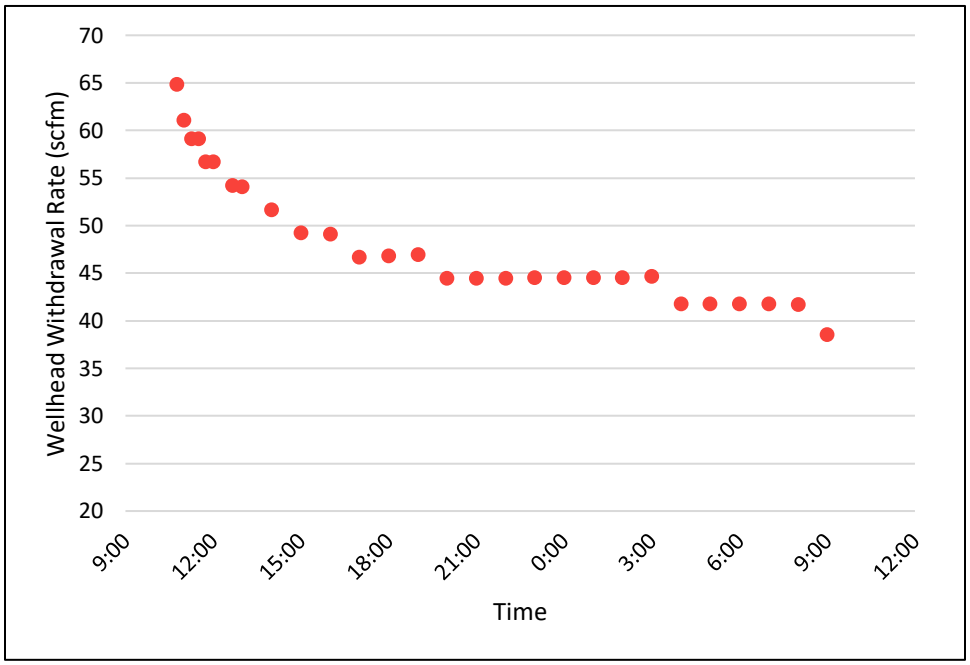


The maximum vacuum achieved during the stepped-rate test was 62 WCI, which yielded a flow rate of 62.6 standard cubic feet per minute (scfm). Because the vacuum-flow response curved indicated that flow increased with applied vacuum to the maximum applied vacuum the blower could sustain, the maximum applied vacuum and corresponding flow rate were selected for the constant-rate test. In addition, in-situ vacuum response to increased applied vacuum corresponded well at all monitoring points during the stepped-rate test.

4.1.2 CONSTANT-RATE TEST

As shown in Figure 4-2 below, during the first 12 hours of the 23-hour constant rate test, the applied vacuum generally increased from 60 WCI to 64 WCI at RW-07 and the flow rate steadily decreased from 64.8 scfm to 44.5 scfm. During the final 11 hours of the test, the applied vacuum remained steady at 64 WCI and the flow rate slowly decreased from 44.5 scfm to 38.5 scfm. Vacuum response and system operation generally stabilized after approximately 12 hours. The data collected during the constant rate test is included in Appendix A.

Figure 4-2: RW-07 Flow Rate over Time (Constant-Rate Test, 60 WCI)

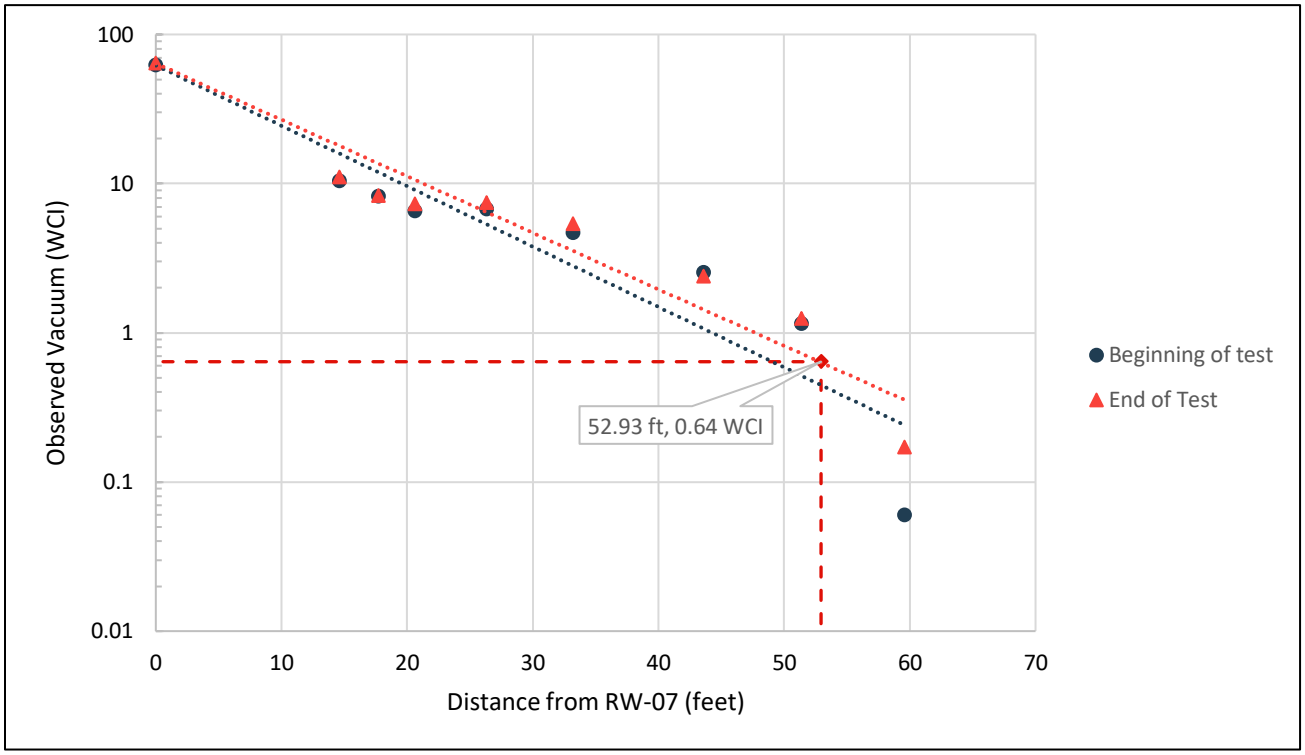


4.2 RADIUS OF INFLUENCE

4.2.1 VACUUM INFLUENCE MEASUREMENTS – DEEP MONITORING POINTS

Figure 4-3 below depicts the vacuum influence measured at the monitoring points that were screened across the water table during the constant-rate test and provides an estimate of the effective vacuum radius of influence (ROI) at the depth of 25 feet below grade (ftbg). The observed vacuum measurements at each monitoring point were plotted against their respective distances from RW-07 using a logarithmic scale. An exponential regression line was fit to the data to estimate the ROI.

Figure 4-3: Radius of Influence Evaluation (25 ftbg)



Assuming that effective ROI is defined as 1 percent of applied vacuum (0.64 WCI for the end of test), the estimated effective ROI at 25 ftbg is approximately 52.9 feet.

4.2.2 VACUUM INFLUENCE MEASUREMENTS – SHALLOW MONITORING POINTS

In addition to the existing remediation and monitoring wells that were screened across the water table, WSP installed three shallower VMPs as described in Section 3.2.2 to evaluate vacuum influence in the shallow portion of the vadose zone (above 10 ftbg). The observed vacuums at each VMP from the beginning and end of constant-rate test are summarized in Table 4-2 below.

Table 4-2: Shallow Vapor Monitoring Points (Constant-Rate Test, 60 WCI)

VAPOR MONITORING POINT	DISTANCE (FT)	START OF TEST VACUUM (WCI)	END OF TEST VACUUM (WCI)
RW-07	0	62	64
VMP-06	14.4	0.00	0.00
VMP-09	20.5	0.18	0.26
VMP-11	43.8	1.49	1.64

These results indicate that vacuum influence in the shallow zone increased with increasing distance from the extraction point, as no vacuum was measured at VMP-6, located approximately 14.4 feet from RW-07, while vacuum was observed above 1 percent of the applied vacuum level at VMP-11, located approximately 43.8 feet from RW-07. Based on soil boring data from the installation of the remediation wells and soil sampling during the SSI and as shown in Figure 3-7 of the *SSI Report* (WSP, 2022), there is a lens of silty clay approximately 10 ftbg

near RW-07 and RW-06. The clay layer was not observed at RW-11. Based on the VMP data, it appears that this clay layer acts as a barrier to vapor extraction, but vacuum influence is achievable in the shallow zone where the clay lens is not present.

4.2.3 PORE VOLUME EXCHANGE ESTIMATE

Optimal SVE system operation typically requires one to two pore volume exchanges of soil vapor per day within the treatment area. The pore volume (PV) in the treatment area is estimated by the following Equation 4-1:

$$PV = H * \pi R^2 * \eta \quad \textbf{Equation 4-1}$$

where H is the height (total depth) of the treatment zone, R is the radius of the treatment zone surrounding the extraction point, and η is the soil porosity. The pore volume exchange rate (ER), or the number of pore volume exchanges of soil vapor in the treatment zone per day, is defined in Equation 4-2:

$$ER = (Q * 1440)/PV \quad \textbf{Equation 4-2}$$

where Q is the soil vapor extraction rate in scfm. Combining Equations 4-1 and 4-2 yields:

$$ER = (Q * 1440)/(H * \pi R^2 * \eta) \quad \textbf{Equation 4-3}$$

Boring logs from the installation of the remediation wells indicate that the treatment area primarily consists of silty sand with intermittent layers of silty clay and one thin lens of gravel. WSP collected geotechnical samples from RW-09 during the well installation to measure several parameters, including a site-specific porosity (SSI Report, 2022). The maximum estimate for the porosity in the treatment area is 0.3, which will provide a conservative estimate of the pore volume in the treatment area. Based on an assumed treatment area from 10 ftbg to the water table at 25 ftbg, the estimated pore volume exchange rate at the end of the constant-rate test was 1.4 pore volumes per day, which is within they typical design standard of 1 to 2 pore volume exchanges per day.

4.3 ESTIMATED VOC VAPOR MASS REMOVAL RATES

As summarized on Table 1, BTEX compounds (benzene, toluene, ethylbenzene, m,p-xylene and o-xylene) and other VOCs (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 4-ethyltoluene, cumene, cyclohexane, heptane and hexane) were detected in each inlet vapor sample collected during the constant-rate test, with hexane detected at the highest concentration. Hexane and m,p-xylene were detected in the vapor samples during the tests but the results were all “E” flagged as approximate values are above the quantitation range. The laboratory analytical report is included in Appendix B.

Table 2 provides VOC mass removal calculations for the entire duration of the pilot test, including both the stepped-rate and constant-rate tests. The vapor analytical results from the sample collected at the beginning of the constant-rate test (SVE-1) were used to calculate the mass removal during the stepped rate test and the first 8 hours of the constant rate test. The analytical results from vapor sample collected approximately 12 hours into the constant-rate test (SVE-2) were used to calculate mass removal during the middle 8 hours of the constant-rate test. The analytical results from vapor sample collected at the end of the constant-rate test (SVE-3) were used to calculate mass removal during the final 7 hours of the constant-rate test.

The VOC mass removal during the pilot test ranged from approximately 21.01 pounds per hour (lbs/hour) during Step 3 of the stepped-rate test to approximately 8.98 lbs/hour at the end of the constant-rate test. Approximately 46 pounds of VOCs were removed during the stepped-rate test and approximately 312 pounds of VOCs were removed during the constant-rate test; therefore, a total of approximately 358 pounds of VOCs were extracted during the pilot test.

The specific gravity of composite product samples collected at the Site in March 2022 was 0.6643. Applying a conversion factor for the density of water at 60 degrees Fahrenheit, the density of the product is calculated to be 5.54 pounds per gallon. Based on this density, the 358 pounds of VOCs recovered during the pilot test is equivalent to approximately 64.7 gallons (1.5 barrels) of recovered product.

4.4 WATER GENERATION

Following the completion of the stepped-rate and constant-rate tests, approximately nine gallons of SVE condensate water was removed from the VLS. During the process of conducting the tests, water was not observed in the sight-glass on the VLS. The SVE condensate water was containerized on Site for characterization and disposal. The water was disposed of on October 7, 2022, with other wastewater generated at the Site during free product recovery efforts.

4.5 VAPOR TREATMENT AND PERMITTING

Extracted soil vapor passed through one vapor-phase granular activated carbon (GAC) unit to remove VOCs before discharging to the atmosphere. To confirm treatment of the extracted vapor, WSP monitored the SVE emissions real-time using a PID. In total, the step-test and constant-rate tests evacuated approximately 80,020 standard cubic feet (scf) of air from RW-07. The pilot test evacuated less than 150,000 scf of air from RW-07; therefore, under NR 406.04(1)(m)3 and NR 407.03(1)(sm)3, the pilot test is exempt from air permitting requirements.

To evaluate the long-term treatment efficacy of the extracted vapor using GAC, treated vapor was monitored routinely with a PID throughout the test. PID readings of treated vapor at the GAC discharge were compared to inlet readings to confirm treatment (Appendix A). During the first step of the stepped-rate test, the GAC removed 100 percent of the extracted VOCs. However, throughout the remainder of the stepped-rate and constant-rate tests, the GAC treatment efficacy gradually decreased, with only 5 percent treatment observed at the end of the constant-rate test.

To confirm the PID readings, a sample of GAC-treated vapor was collected in conjunction with the inlet sample at the end of the constant-rate test (SVE-4). The analytical results are summarized on Table 1. Elevated concentrations of several compounds (benzene, cyclohexane, heptane, and hexane) were detected in the GAC-treated discharge vapor sample. However, comparing the total VOC concentrations in the sample of the influent vapor (SVE-3; 57,447,010 micrograms per cubic meter [ug/m^3]) to the GAC-treated discharge sample (SVE-4; 9,018,000 ug/m^3), the GAC treatment efficiency was approximately 84 percent at the end of the pilot test, suggesting better GAC treatment efficacy than indicated by the PID results.

5 TEST CONCLUSIONS

The results of the stepped-rate and constant-rate tests indicate that SVE can be successfully implemented to address the remaining soil impacts in the source zone, which are present from approximately 10 ftbg to 25 ftbg. During long-term operation, a vapor flow rate of approximately 40 scfm can be achieved at an applied vacuum of 64 WCI, with a vacuum influence of up to 52.9 feet. As shown in Figure 3, vacuum influence can be achieved over the area of delineated soil impacts greater than 5.1 ug/kg can be covered by five wells (3 existing wells and 2 newly installed SVE wells), with sufficient ROI overlap in the center of the treatment area to maximize mass recovery.

Based on the observed VOC mass removal rate at the end of the constant-rate test (approximately 9 lbs/hour), initial operation of a full-scale SVE system consisting of five extraction wells would be expected to remove approximately 45 lbs/hour of VOCs, or approximately 1,080 pounds of VOCs per day, equivalent to approximately 195 gallons of product per day. Based on GAC-treated discharge vapor sampling results, additional analysis of vapor treatment will be necessary to design the full-scale system in order to comply with WDNR permitting requirements.

6 REFERENCES

- WSP, 2022a. Supplemental Site Investigation Report. Enbridge Line 13 MP 312 Valve Site (BRRTS # 02-28-586199). March 16.
- WSP, 2022b. Remedial Action Options Report. Enbridge Line 13 MP 312 Valve Site (BRRTS # 02-28-586199). May 19.

7 ACRONYM LIST

BGS	below ground surface
BRRTS	Bureau for Remediation and Redevelopment Tracking System
EPA	Environmental Protection Agency
GAC	granular activated carbon
MP	Milepost
MW	Monitoring Well
O&M	operations & maintenance
PID	photoionization detector
RAO	remedial action option
RAOR	Remedial Action Options Report
ROI	radius of influence
RW	remediation well
scf	standard cubic feet
SSI	Supplemental Site Investigation
SVE	soil vapor extraction
UVOST	ultra-violet optical screening tool
VMP	vapor monitoring point
VOC	volatile organic compound
WAC	Wisconsin Administrative Code
WDNR	Wisconsin Department of Natural Resources

FIGURES

Drawn:	WSP 9/23/2022
Approved:	WSP 9/23/2022
Project #:	31401967.705B

Map Location

N

0 15

Feet

Coordinate System: NAD 1983
StatePlane Wisconsin South FIPS
4803 Feet

Legend

SVE Pilot Test Points

- Extraction
- Vacuum Monitoring
- Vacuum Monitoring (Shallow)
- Remediation Well
- Monitoring Well
- Pipeline Valve
- Cross Section
- June 2021 UVOST Response Approximate Thickness for Interval 24-30' bgs
- Enbridge Pipeline (Below Grade)
- Gravel Perimeter
- Site Fence
- Property Parcels

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Note: June 2021 UVOST response thickness is estimate of vertical interval near water table with UVOST response indicative of free product.

FIGURE 1
SVE PILOT TEST POINTS

LINE 13 MP 312 VALVE SITE
FORT ATKINSON, WISCONSIN

ENBRIDGE ENERGY
LIMITED PARTNERSHIP

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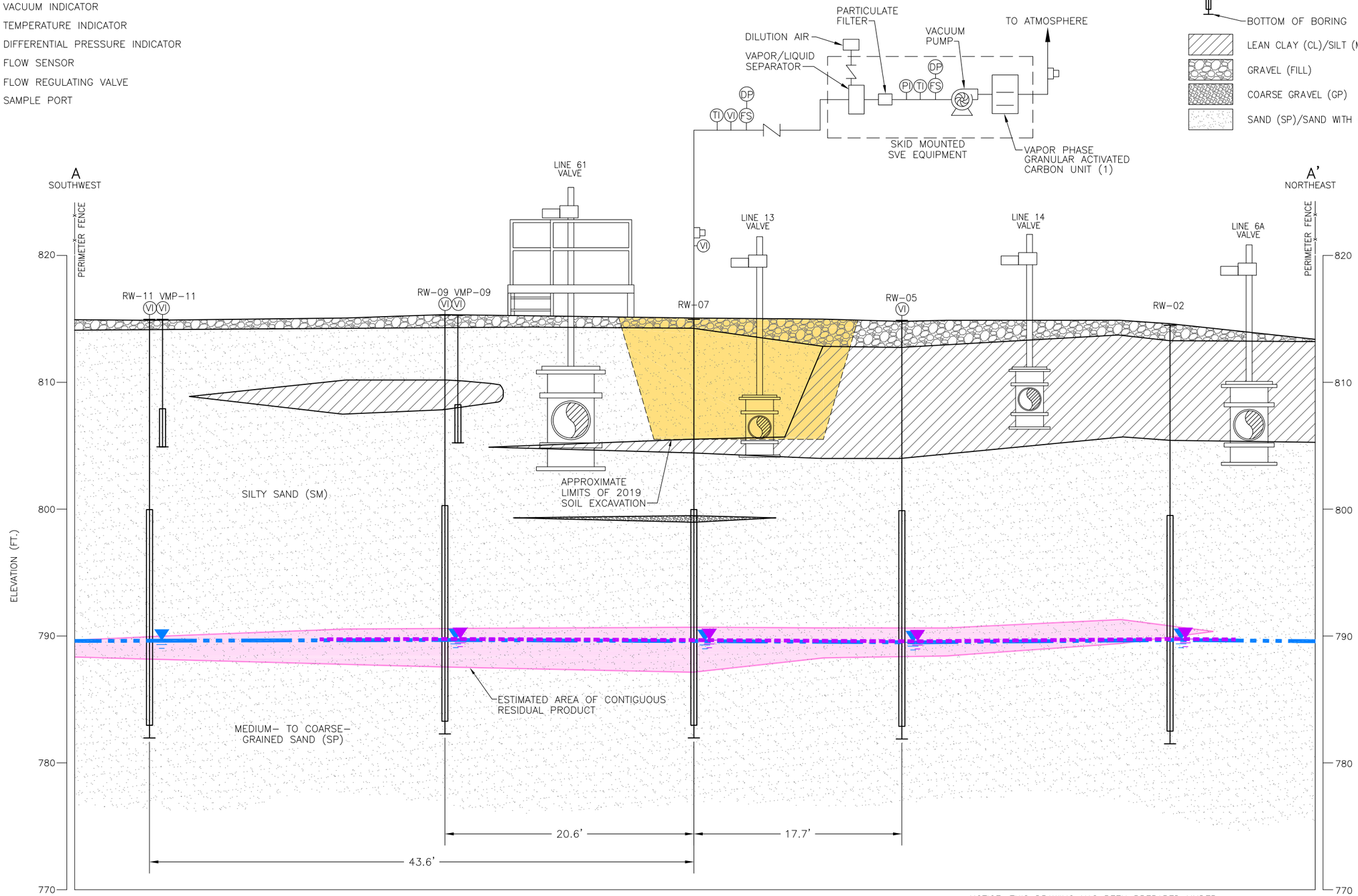
SCHEMATIC LEGEND

- PI PRESSURE INDICATOR
- VI VACUUM INDICATOR
- TI TEMPERATURE INDICATOR
- DP DIFFERENTIAL PRESSURE INDICATOR
- FS FLOW SENSOR
- FLOW REGULATING VALVE
- SAMPLE PORT

LEGEND

- MW-01-32 — WELL/BORING ID
- PRODUCT LEVEL, JUNE 2, 2022
- GROUNDWATER LEVEL, JUNE 2, 2022
- SCREENED INTERVAL
- BOTTOM OF BORING
- LEAN CLAY (CL)/SILT (ML)/SANDY SILT (ML)
- GRAVEL (FILL)
- COARSE GRAVEL (GP)
- SAND (SP)/SAND WITH GRAVEL (SP)



B

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NOT TO SCALE

Drawn By: EGC
Checked: EW 8/30/2022
Approved: TAH 8/30/2022
DWG Name: 314V1967.705-016

LINE 13 MP 312 VALVE SITE
FORT ATKINSON, WISCONSIN

PREPARED FOR
ENBRIDGE ENERGY LIMITED PARTNERSHIP
DULUTH, MINNESOTA

FIGURE 2

CONCEPTUAL TEST PROCESS AND EQUIPMENT DESIGN

ENBRIDGE

R:\ACAD\CADD_CLIENT\Enbridge\314O1967.705\CAD\314V1967.705-016.dwg 8/30/2022 3:06 PM USEC01012

SVE-1
SVE-2
RW-2
RW-8
RW-10
TRI-STATE
HOLDINGS LLC
016-0514-0824-003
Line 6A
Line 14
Line 13
Line 61
5.1
10
50
100

ENBRIDGE

Drawn:	WSP 9/23/2022
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Project #:	31401967.705B

Map Location

N

0 30
Feet

Coordinate System: NAD 1983
StatePlane Wisconsin South FIPS
4803 Feet

Legend

- Proposed SVE Wells
- Remediation Well
- Monitoring Well
- Enbridge Pipeline (Below Grade)
- SVE Wells Radius of Influence
- Gravel Perimeter
- Site Fence
- Property Parcels

Soil Benzene Isocontour (ppb) - Dashed where Inferred

- 5.1
- 10
- 50
- 100

FIGURE 3
PROPOSED SVE WELLS WITH RADIUS OF INFLUENCE

LINE 13 MP 312 VALVE SITE
FORT ATKINSON, WISCONSIN

ENBRIDGE ENERGY
LIMITED PARTNERSHIP

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TABLES

Table 1
Vapor Sample Laboratory Analytical Results
Line 13 MP 312 SVE Pilot Test
Enbridge Inc.
Fort Atkinson, Wisconsin

Sample ID:	SVE-1	SVE-2	SVE-3	SVE-4
Date:	8/10/22	8/10/22	8/11/22	8/11/22
Time:	12:38	23:36	9:35	9:45
Analyte				
1,1,1-Trichloroethane	<1,360	<1,360	<1,360	<1,360
1,1,2,2-Tetrachloroethane	<1,720	<1,720	<1,720	<1,720
1,1,2-Trichloroethane	<546	<546	<546	<546
1,1-Dichloroethane	<1,010	<1,010	<1,010	<1,010
1,1-Dichloroethene	<991	<991	<991	<991
1,2,4-Trichlorobenzene	<1,860	<1,860	<1,860	<1,860
1,2,4-Trimethylbenzene	**13,100**	**27,700**	**30,100**	<1,230
1,2-Dibromoethane	<768	<768	<768	<768
1,2-Dichlorobenzene	<1,500	<1,500	<1,500	<1,500
1,2-Dichloroethane	<405	<405	<405	<405
1,2-Dichloropropane	<1,160	<1,160	<1,160	<1,160
1,3,5-Trimethylbenzene	**8,110**	**14,300**	**14,300**	<1,230
1,3-Butadiene	<221	<221	<221	<221
1,3-Dichlorobenzene	<1,500	<1,500	<1,500	<1,500
1,4-Dichlorobenzene	<601	<601	<601	<601
1,4-Dioxane	<1,800	<1,800	<1,800	<1,800
2-Butanone	<1,470	<1,470	<1,470	<1,470
2-Hexanone	<2,050	<2,050	<2,050	<2,050
2-Propanol	<1,230	<1,230	<1,230	<1,230
4-Ethyltoluene	**4,990**	**9,460**	**9,190**	<1,230
4-Methyl-2-pentanone	<2,050	<2,050	<2,050	<2,050
Acetone	<1,190	<1,190	<1,190	<1,190
Benzene	**1,910,000**	**1,590,000**	**1,560,000**	**277,000**
Benzyl chloride	<2,590	<2,590	<2,590	<2,590
Bromodichloromethane	<670	<670	<670	<670
Bromoform	<2,580	<2,580	<2,580	<2,580
Bromomethane	<971	<971	<971	<971
Carbon disulfide	<778	<778	<778	<778
Carbon tetrachloride	<1,570	<1,570	<1,570	<1,570
Chlorobenzene	<1,150	<1,150	<1,150	<1,150
Chloroethane	<660	<660	<660	<660
Chloroform	<488	<488	<488	<488
Chloromethane	<516	<516	<516	<516
cis-1,2-Dichloroethene	<991	<991	<991	<991
cis-1,3-Dichloropropene	<1,130	<1,130	<1,130	<1,130
Cumene	**2,650**	**3,740**	**3,020**	<1,230
Cyclohexane	**23,100,000**	**7,470,000**	**7,090,000**	**1,520,000**
Dibromochloromethane	<2,130	<2,130	<2,130	<2,130
Dichlorodifluoromethane	<1,240	<1,240	<1,240	<1,240
Ethyl acetate	<901	<901	<901	<901
Ethylbenzene	**43,200**	**39,500**	**35,700**	<1,090

Table 1
Vapor Sample Laboratory Analytical Results
Line 13 MP 312 SVE Pilot Test
Enbridge Inc.
Fort Atkinson, Wisconsin

Sample ID:	SVE-1	SVE-2	SVE-3	SVE-4
Date:	8/10/22	8/10/22	8/11/22	8/11/22
Time:	12:38	23:36	9:35	9:45
Analyte				
Freon 113	<1,920	<1,920	<1,920	<1,920
Freon 114	<1,750	<1,750	<1,750	<1,750
Heptane	**7,760,000**	**4,710,000**	**4,820,000**	**531,000**
Hexachlorobutadiene	<1,070	<1,070	<1,070	<1,070
Hexane	**73,000,000 E**	**42,500,000**	**43,000,000**	**6,690,000**
m,p-Xylene	**132,000 E**	**116,000 E**	**114,000 E**	<1,090
Methylene chloride	<3,500	<3,500	<3,500	<3,500
MTBE	<901	<901	<901	<901
Naphthalene	<524	<524	<524	<524
o-Xylene	**35,100**	**39,900**	**34,700**	<1,090
Propene	<430	<430	<430	<430
Styrene	<1,060	<1,060	<1,060	<1,060
Tetrachloroethene	<1,700	<1,700	<1,700	<1,700
Tetrahydrofuran	<737	<737	<737	<737
Toluene	**651,000**	**693,000**	**736,000**	<942
trans-1,2-Dichloroethene	<991	<991	<991	<991
trans-1,3-Dichloropropene	<1,130	<1,130	<1,130	<1,130
Trichloroethene	<537	<537	<537	<537
Trichlorofluoromethane	<1,400	<1,400	<1,400	<1,400
Vinyl acetate	<1,760	<1,760	<1,760	<1,760
Vinyl chloride	<639	<639	<639	<639

Notes:

a/ All results in micrograms per cubic meter (mg/m^3).

Values in bold indicate detection above laboratory's reporting limit.

E = Value above quantitation range

< = not detected above the method detection limit.

Table 2
VOC Vapor Mass Removal Rate Estimates
Line 13 MP312 SVE Pilot Test
Enbridge Inc.
Fort Atkinson, Wisconsin

Stepped-Rate Test - Step 1
Vapor Sample ID: SVE-1
Average Flow Rate: 29.2 scfm
Duration (hh:mm): 00:46

Detected VOC	VOC Concentration in Vapor		VOC Emission Rate	Mass Removed
	(µg/m^3)	(lbs/scf)	(lbs/hr)	(lbs)
1,2,4-Trimethylbenzene	13,100	8.18E-07	0.00	0.00
1,3,5-Trimethylbenzene	8,110	5.06E-07	0.00	0.00
4-Ethyltoluene	4,990	3.12E-07	0.00	0.00
Benzene	1,910,000	1.19E-04	0.21	0.16
Cumene	2,650	1.65E-07	0.00	0.00
Cyclohexane	23,100,000	1.44E-03	2.53	1.94
Ethylbenzene	43,200	2.70E-06	0.00	0.00
Heptane	7,760,000	4.84E-04	0.85	0.65
Hexane	73,000,000	4.56E-03	7.98	6.12
m,p-Xylene	132,000	8.24E-06	0.01	0.01
o-Xylene	35,100	2.19E-06	0.00	0.00
Toluene	651,000	4.06E-05	0.07	0.05
Totals:	**106,660,150**	**6.66E-03**	**11.67**	**8.94**

Stepped-Rate Test - Step 2
Vapor Sample ID: SVE-1
Average Flow Rate: 57.2 scfm
Duration (hh:mm): 00:45

Detected VOC	VOC Concentration in Vapor		VOC Emission Rate	Mass Removed
	(µg/m^3)	(lbs/scf)	(lbs/hr)	(lbs)
1,2,4-Trimethylbenzene	13,100	8.18E-07	0.00	0.00
1,3,5-Trimethylbenzene	8,110	5.06E-07	0.00	0.00
4-Ethyltoluene	4,990	3.12E-07	0.00	0.00
Benzene	1,910,000	1.19E-04	0.41	0.31
Cumene	2,650	1.65E-07	0.00	0.00
Cyclohexane	23,100,000	1.44E-03	4.95	3.71
Ethylbenzene	43,200	2.70E-06	0.01	0.01
Heptane	7,760,000	4.84E-04	1.66	1.25
Hexane	73,000,000	4.56E-03	15.64	11.73
m,p-Xylene	132,000	8.24E-06	0.03	0.02
o-Xylene	35,100	2.19E-06	0.01	0.01
Toluene	651,000	4.06E-05	0.14	0.10
Totals:	**106,660,150**	**6.66E-03**	**22.85**	**17.14**

Table 2
VOC Vapor Mass Removal Rate Estimates
Line 13 MP312 SVE Pilot Test
Enbridge Inc.
Fort Atkinson, Wisconsin

Stepped-Rate Test - Step 3
Vapor Sample ID: SVE-1
Average Flow Rate: 62.3 scfm
Duration (hh:mm): 00:48

Detected VOC	VOC Concentration in Vapor		VOC Emission Rate	Mass Removed
	(µg/m^3)	(lbs/scf)	(lbs/hr)	(lbs)
1,2,4-Trimethylbenzene	13,100	8.18E-07	0.00	0.00
1,3,5-Trimethylbenzene	8,110	5.06E-07	0.00	0.00
4-Ethyltoluene	4,990	3.12E-07	0.00	0.00
Benzene	1,910,000	1.19E-04	0.45	0.36
Cumene	2,650	1.65E-07	0.00	0.00
Cyclohexane	23,100,000	1.44E-03	5.39	4.31
Ethylbenzene	43,200	2.70E-06	0.01	0.01
Heptane	7,760,000	4.84E-04	1.81	1.45
Hexane	73,000,000	4.56E-03	17.03	13.63
m,p-Xylene	132,000	8.24E-06	0.03	0.02
o-Xylene	35,100	2.19E-06	0.01	0.01
Toluene	651,000	4.06E-05	0.15	0.12
Totals:	**106,660,150**	**6.66E-03**	**24.89**	**19.91**

Constant-Rate Test - First 8 Hours
Vapor Sample ID: SVE-1
Average Flow Rate: 52.6 scfm
Duration (hh:mm): 08:15

Detected VOC	VOC Concentration in Vapor		VOC Emission Rate	Mass Removed
	(µg/m^3)	(lbs/scf)	(lbs/hr)	(lbs)
1,2,4-Trimethylbenzene	13,100	8.18E-07	0.00	0.02
1,3,5-Trimethylbenzene	8,110	5.06E-07	0.00	0.01
4-Ethyltoluene	4,990	3.12E-07	0.00	0.01
Benzene	1,910,000	1.19E-04	0.38	3.10
Cumene	2,650	1.65E-07	0.00	0.00
Cyclohexane	23,100,000	1.44E-03	4.55	37.55
Ethylbenzene	43,200	2.70E-06	0.01	0.07
Heptane	7,760,000	4.84E-04	1.53	12.61
Hexane	73,000,000	4.56E-03	14.38	118.66
m,p-Xylene	132,000	8.24E-06	0.03	0.21
o-Xylene	35,100	2.19E-06	0.01	0.06
Toluene	651,000	4.06E-05	0.13	1.06
Totals:	**106,660,150**	**6.66E-03**	**21.01**	**173.37**

Table 2
VOC Vapor Mass Removal Rate Estimates
Line 13 MP312 SVE Pilot Test
Enbridge Inc.
Fort Atkinson, Wisconsin

Constant-Rate Test - Middle 8 Hours
Vapor Sample ID: SVE-1
Average Flow Rate: 44.8 scfm
Duration (hh:mm): 08:00

Detected VOC	VOC Concentration in Vapor		VOC Emission Rate	Mass Removed
	(µg/m^3)	(lbs/scf)	(lbs/hr)	(lbs)
1,2,4-Trimethylbenzene	27,700	1.73E-06	0.00	0.04
1,3,5-Trimethylbenzene	14,300	8.93E-07	0.00	0.02
4-Ethyltoluene	9,460	5.91E-07	0.00	0.01
Benzene	1,590,000	9.93E-05	0.27	2.13
Cumene	3,740	2.33E-07	0.00	0.01
Cyclohexane	7,470,000	4.66E-04	1.25	10.03
Ethylbenzene	39,500	2.47E-06	0.01	0.05
Heptane	4,710,000	2.94E-04	0.79	6.32
Hexane	42,500,000	2.65E-03	7.13	57.05
m,p-Xylene	116,000	7.24E-06	0.02	0.16
o-Xylene	39,900	2.49E-06	0.01	0.05
Toluene	693,000	4.33E-05	0.12	0.93
Totals:	**57,213,600**	**3.57E-03**	**9.60**	**76.80**

Constant-Rate Test - Final 7 Hours
Vapor Sample ID: SVE-1
Average Flow Rate: 41.7 scfm
Duration (hh:mm): 06:55

Detected VOC	VOC Concentration in Vapor		VOC Emission Rate	Mass Removed
	(µg/m^3)	(lbs/scf)	(lbs/hr)	(lbs)
1,2,4-Trimethylbenzene	30,100	1.88E-06	0.00	0.03
1,3,5-Trimethylbenzene	14,300	8.93E-07	0.00	0.02
4-Ethyltoluene	9,190	5.74E-07	0.00	0.01
Benzene	1,560,000	9.74E-05	0.24	1.69
Cumene	3,020	1.89E-07	0.00	0.00
Cyclohexane	7,090,000	4.43E-04	1.11	7.67
Ethylbenzene	35,700	2.23E-06	0.01	0.04
Heptane	4,820,000	3.01E-04	0.75	5.21
Hexane	43,000,000	2.68E-03	6.72	46.50
m,p-Xylene	114,000	7.12E-06	0.02	0.12
o-Xylene	34,700	2.17E-06	0.01	0.04
Toluene	736,000	4.59E-05	0.12	0.80
Totals:	**57,447,010**	**3.59E-03**	**8.98**	**62.12**

Table 2
VOC Vapor Mass Removal Rate Estimates
Line 13 MP312 SVE Pilot Test
Enbridge Inc.
Fort Atkinson, Wisconsin

Summary Calculations

Stage	Total VOC Emmission Rate (lb/hr)	Total Mass Removed (lbs)	Volume Removed (gal)	Volume Removed (bbl)
Stepped-Rate Test				
Step 1	11.67	8.94	1.6	0.04
Step 2	22.85	17.14	3.1	0.07
Step 3	24.89	19.91	3.6	0.09
Subtotal	--	**45.99**	**8.3**	**0.20**
Constant-Rate Test				
First 8 Hours	21.01	173.37	31.3	0.75
Middle 8 Hours	9.60	76.80	13.9	0.33
Final 7 Hours	8.98	62.12	11.2	0.27
Subtotal	--	**312.29**	**56.4**	**1.34**
Pilot Test Total				
Pilot Test Total	--	**358.29**	**64.7**	**1.54**

a/ NOTE: VOC concentrations are assumed to be reported at standard temperature and pressure (STP)

m^3 = cubic meter.
µg = micrograms
lb = pound
m = minute
hr = hour
VOC = volatile organc compound.

scf = standard cubic foot at STP
scfm = standard cubic foot per minute at STP

1 µg =	2.2046E-09	lb
1 m^3 =	3.5315E+01	cf
1 barrel =	42	gallons
Specific Gravity of Product at 60F =	0.6643	
Density of Water at 60F =	62.366	lb/cf
=	8.34	lb/gallon
Density of Product =	5.54	lb/gallon

A SVE PILOT TEST FIELD DATA

SVE Pilot Test Data Collection - Step Test
Enbridge Energy, Limited Partnership
L13 MP312 Valve Site
Fort Atkinson, Wisconsin

Date: 8/9/2022
Arrival Time: 8:00
Weather: Sunny, high 70's
WSP Staff: E. Wesseldyke, C. Hegna

System Operational Measurements

Step	Time	Wellhead (RW-07) Data			VLS Data			Particulate Filter		Blower Inlet		Blower Outlet		GAC Effluent
		Vacuum (WCl)	ΔP (WCl)	Flow (scfm)	Vacuum (WCl)	Temp (°F)	Water Level (in)	Vacuum (WCl)	ΔP (WCl)	ΔP (WCl)	Flow (scfm)	Pressure (WCl)	Temp (°F)	Pressure (psi)
1	10:59	19	0.32	29.7	48	80	0	48	0	2.6	340.3	4	120	0
	11:16	19	0.32	29.6	48	81	0	48	0	2.6	340.0	4	125	0
	11:30	19	0.3	28.7	47.5	81	0	48	0	2.6	340.0	4	125	0
	11:45	19.5	0.3	28.7	47	81	0	48	0	2.6	340.0	4	125	0
2	12:27	40	1.4	59.9	44	88	0	46	0	2.6	338.8	4	125	0
	12:42	43	1.3	57.8	46	81	0	46	0	2.6	340.9	4	125	0
	12:57	43.5	1.2	55.5	46	81	0	46	0	2.6	340.9	4	125	0
	13:12	43.5	1.2	55.5	45.5	81	0	46	0	2.6	340.9	4	125	0
3	14:11	60	1.6	63.0	66	73	0	69	0	2.0	291.2	3	130	0
	14:27	62	1.5	60.9	66	73	0	68	0	1.9	284.2	3	130	0
	14:42	62	1.6	62.9	66	73	0	68	0	1.9	284.2	3	130	0
	14:59	62	1.6	62.6	65	77	0	68	0	1.9	283.1	3	130	0

Vacuum Readings (WCl)

Step	Time	RW-07	RW-01	RW-03	RW-05	RW-06	VMP-06	RW-09	VMP-09	RW-11	VMP-11	MW-01-32	MW-14-31
1	10:59	19	2.10	2.94	3.53	4.55	0.00	3.27	0.10	1.29	0.85	0.60	0.00
	11:16	19	2.59	3.58	3.82	4.90	0.00	3.44	0.10	1.38	0.96	0.64	0.00
	11:30	19	2.72	3.65	3.85	5.10	0.00	3.42	0.10	1.39	0.91	0.67	0.00
	11:45	19.5	2.67	3.61	3.98	5.16	0.00	3.53	0.12	1.33	0.93	0.66	0.00
2	12:27	40	3.17	4.58	6.17	8.31	0.00	5.84	0.13	2.02	1.19	0.88	0.00
	12:42	43	5.11	6.92	7.75	9.96	0.00	6.77	0.16	2.61	1.72	1.22	0.00
	12:57	43.5	5.35	7.19	8.00	10.10	0.00	6.88	0.18	2.68	1.76	1.27	0.00
	13:12	43.5	5.28	7.18	7.77	10.04	0.00	6.76	0.16	2.62	1.72	1.22	0.05
3	14:11	60	4.60	6.64	7.91	10.77	0.00	7.35	0.17	2.67	1.63	1.23	0.06
	14:27	62	6.43	8.66	9.48	12.21	0.00	8.20	0.23	3.16	2.06	1.48	0.17
	14:42	62	6.49	8.87	9.68	12.41	0.00	8.24	0.23	3.17	2.11	1.52	0.06
	14:59	62	6.57	8.82	9.64	12.41	0.00	8.25	0.23	3.14	2.09	1.51	0.12

PID Readings

Step	Time	Wellhead (RW-07)		Blower Effluent		GAC Effluent
		Flow (scfm)	PID (ppm)	Flow (scfm)	PID (ppm)	PID (ppm)
1	10:59	29.7	215.2	340.3	--	4.5
	11:16	29.6	397.2	340.0	383.3	112.7
	11:30	28.7	332.2	340.0	383.1	0
	11:45	28.7	382.4	340.0	519.4	0
2	12:27	59.9	331.8	338.8	--	--
	12:42	57.8	--	340.9	547.2	137
	12:57	55.5	314.8	340.9	554.2	172.1
	13:12	55.5	330.1	340.9	469.8	230.8
3	14:11	63.0	305.8	291.2	392.5	264.7
	14:27	60.9	343	284.2	394.1	270.4
	14:42	62.9	475.6	284.2	410	285
	14:59	62.6	444	283.1	479.1	410.1

Notes:
-Wellhead PID measurements were collected at the VLS inlet
-Temperature used for flow rate calculations was measured at the VLS inlet

SVE Pilot Test Data Collection - Constant Rate Test (60 WCI)
Enbridge Energy, Limited Partnership
L13 MP312 Valve Site
Fort Atkinson, Wisconsin

Date:	8/10/2022
Arrival Time:	8:00
Weather:	Sunny, high 80's °F
WSP Staff	E. Wesseldyke, C. Hegna

System Operational Measurements

Date	Time	Date-Time	Wellhead (RW-07) Data			VLS Data			Particulate Filter		Blower Inlet		Blower Outlet		GAC Effluent
			Vacuum (WCI)	ΔP (WCI)	Flow (scfm)	Vacuum (WCI)	Temp (°F)	Water Level (in)	Vacuum (WCI)	ΔP (WCI)	ΔP (WCI)	Flow (scfm)	Pressure (WCI)	Temp (°F)	Pressure (psi)
08/10/22	10:45	08/10/22 10:45	62	1.7	64.8	66	74	0	68	0	2.1	298.9	3.5	138	0
08/10/22	11:00	08/10/22 11:00	60	1.5	61.0	65	74	0	67	0	2.0	292.1	3.5	138	0
08/10/22	11:15	08/10/22 11:15	60	1.4	59.1	64	72	0	66	0	2.0	293.1	3.5	135	0
08/10/22	11:30	08/10/22 11:30	60	1.4	59.1	64	72	0	66	0	1.9	285.7	3.5	135	0
08/10/22	11:45	08/10/22 11:45	60	1.3	56.7	64	77	0	66	0	1.9	284.3	3.5	138	0
08/10/22	12:00	08/10/22 12:00	60	1.3	56.7	64	77	0	66	0	1.9	284.3	3.5	138	0
08/10/22	12:40	08/10/22 12:40	61	1.2	54.2	64	80	0	65	0	1.9	283.8	3.5	140	0
08/10/22	13:00	08/10/22 13:00	61	1.2	54.1	64	82	0	65	0	1.9	283.3	3.5	140	0
08/10/22	14:00	08/10/22 14:00	61	1.1	51.6	64	85	0	65	0	1.9	282.5	3.5	140	0
08/10/22	15:00	08/10/22 15:00	61	1	49.2	64	85	0	66	0	1.9	281.9	3.5	140	0
08/10/22	16:00	08/10/22 16:00	62	1	49.1	64	85	0	66	0	1.9	281.8	3.25	140	0
08/10/22	17:00	08/10/22 17:00	62	0.9	46.7	64	83	0	66	0	1.9	282.4	3.25	140	0

Vacuum Readings (WCI)

Date	Time	Date-Time	RW-07	RW-01	RW-03	RW-05	RW-06	VMP-06	RW-09	VMP-09	RW-11	VMP-11	MW-01-32	MW-14-31
08/10/22	10:45	08/10/22 10:45	62	4.69	6.71	8.17	10.39	0.00	6.55	0.18	2.53	1.49	1.15	0.06
08/10/22	11:00	08/10/22 11:00	60	5.63	8.45	9.36	12.05	0.00	8.05	0.23	3.11	1.98	1.32	0.13
08/10/22	11:15	08/10/22 11:15	60	6.15	8.51	9.27	12.05	0.00	8.01	0.24	3.06	1.98	1.45	0.07
08/10/22	11:30	08/10/22 11:30	60	6.17	8.44	9.18	12.01	0.00	7.88	0.20	3.02	1.89	1.39	0.06
08/10/22	11:45	08/10/22 11:45	60	6.09	8.35	9.13	11.96	0.00	7.85	0.23	2.99	1.91	1.37	0.07
08/10/22	12:00	08/10/22 12:00	60	6.21	8.39	9.12	11.94	0.00	7.88	0.23	3.03	1.92	1.39	0.07
08/10/22	12:40	08/10/22 12:40	61	6.03	8.22	8.92	11.82	0.00	7.68	0.20	2.91	1.83	1.23	0.07
08/10/22	13:00	08/10/22 13:00	61	5.95	8.20	8.90	11.76	0.00	7.65	0.22	2.86	1.85	1.23	0.07
08/10/22	14:00	08/10/22 14:00	61	5.90	8.05	8.82	11.45	0.00	7.52	0.21	2.84	1.80	1.26	0.08
08/10/22	15:00	08/10/22 15:00	61	5.90	8.04	8.76	11.46	0.00	7.47	0.21	2.71	1.75	1.21	0.00
08/10/22	16:00	08/10/22 16:00	62	5.84	7.85	8.68	11.30	0.00	7.19	0.24	2.63	1.71	1.20	0.10
08/10/22	17:00	08/10/22 17:00	62	5.66	7.80	8.53	11.24	0.00	7.18	0.21	2.64	1.66	1.20	0.05

PID Readings

Date	Time	Date-Time	Wellhead (RW-07)		Blower Effluent		GAC Effluent
			Flow (scfm)	PID (ppm)	Flow (scfm)	PID (ppm)	PID (ppm)
08/10/22	10:45	08/10/22 10:45	64.8	371.5	298.9	438.4	181.7
08/10/22	11:00	08/10/22 11:00	61.0	419.3	292.1	447.5	265.4
08/10/22	11:15	08/10/22 11:15	59.1	410	293.1	444	294
08/10/22	11:30	08/10/22 11:30	59.1	410.2	285.7	350.2	--
08/10/22	11:45	08/10/22 11:45	56.7	321.1	284.3	344.8	--
08/10/22	12:00	08/10/22 12:00	56.7	294.5	284.3	348.8	--
08/10/22	12:40	08/10/22 12:40	54.2	249.1	283.8	323	--
08/10/22	13:00	08/10/22 13:00	54.1	265.2	283.3	320.6	252.4
08/10/22	14:00	08/10/22 14:00	51.6	260	282.5	323.5	243.1
08/10/22	15:00	08/10/22 15:00	49.2	259.6	281.9	319.8	235.2
08/10/22	16:00	08/10/22 16:00	49.1	236.1	281.8	294.9	231.8
08/10/22	17:00	08/10/22 17:00	46.7	234.1	282.4	284.9	234.9

Notes:
Wellhead PID measurements were collected at the VLS inlet
Temperature used for flow rate calculations was measured at the VLS inlet
Test started at 10:40 am

SVE Pilot Test Data Collection - Constant Rate Test (60 WCI)
Enbridge Energy, Limited Partnership
L13 MP312 Valve Site
Fort Atkinson, Wisconsin

Date: 8/10/2022
Arrival Time: 8:00
Weather: Sunny, high 80's °F
WSP Staff: E. Wesseldyke, C. Hegna

System Operational Measurements

Date	Time	Date-Time	Wellhead (RW-07) Data			VLS Data			Particulate Filter		Blower Inlet		Blower Outlet		GAC Effluent
			Vacuum (WCI)	ΔP (WCI)	Flow (scfm)	Vacuum (WCI)	Temp (°F)	Water Level (in)	Vacuum (WCI)	ΔP (WCI)	ΔP (WCI)	Flow (scfm)	Pressure (WCI)	Temp (°F)	Pressure (psi)
08/10/22	18:00	08/10/22 18:00	62	0.9	46.8	65	80	0	66	0	1.8	275.5	3.25	140	0
08/10/22	19:00	08/10/22 19:00	62	0.9	46.9	64	77	0	66	0	1.8	276.2	3.25	140	0
08/10/22	20:00	08/10/22 20:00	63	0.8	44.5	65	70	0	66	0	1.8	278.1	3.25	140	0
08/10/22	21:00	08/10/22 21:00	63	0.8	44.5	65	70	0	66	0	1.8	278.1	3.25	140	0
08/10/22	22:00	08/10/22 22:00	64	0.8	44.4	66	70	0	68	0	1.8	277.3	3	140	0
08/10/22	23:00	08/10/22 23:00	64	0.8	44.5	66	68	0	68	0	1.8	277.9	3	140	0
08/11/22	0:00	08/11/22 00:00	64	0.8	44.5	66	68	0	68	0	1.8	278.0	3	135	0
08/11/22	1:00	08/11/22 01:00	64	0.8	44.5	66	68	0	68	0	1.8	278.0	3	135	0
08/11/22	2:00	08/11/22 02:00	64	0.8	44.5	66	68	0	68	0	1.8	278.1	3	135	0
08/11/22	3:00	08/11/22 03:00	64	0.8	44.6	66	66	0	68	0	1.8	278.6	3	130	0
08/11/22	4:00	08/11/22 04:00	64	0.7	41.7	66	66	0	68	0	1.8	278.7	3	130	0
08/11/22	5:00	08/11/22 05:00	64	0.7	41.7	66	66	0	68	0	1.8	278.7	3	125	0

Vacuum Readings (WCI)

Date	Time	Date-Time	RW-07	RW-01	RW-03	RW-05	RW-06	VMP-06	RW-09	VMP-09	RW-11	VMP-11	MW-01-32	MW-14-31
08/10/22	18:00	08/10/22 18:00	62	5.66	7.86	8.64	11.50	0.00	7.47	0.21	2.73	1.73	1.27	0.10
08/10/22	19:00	08/10/22 19:00	62	5.72	7.94	8.66	11.55	0.00	7.56	0.25	2.60	1.76	1.35	0.08
08/10/22	20:00	08/10/22 20:00	63	5.66	7.90	8.61	11.45	0.00	7.58	0.23	2.56	1.77	1.31	0.07
08/10/22	21:00	08/10/22 21:00	63	5.64	7.88	8.66	11.47	0.00	7.56	0.23	2.57	1.80	1.32	0.05
08/10/22	22:00	08/10/22 22:00	64	5.85	7.93	8.65	11.62	0.00	7.63	0.28	2.65	1.86	1.36	0.10
08/10/22	23:00	08/10/22 23:00	64	5.89	7.89	8.79	11.62	0.00	7.68	0.26	2.60	1.84	1.35	0.14
08/11/22	0:00	08/11/22 00:00	64	5.61	7.64	8.62	11.37	0.00	7.41	0.25	2.47	1.73	1.29	0.14
08/11/22	1:00	08/11/22 01:00	64	5.49	7.74	8.55	11.36	0.00	7.58	0.24	2.56	1.78	1.31	0.06
08/11/22	2:00	08/11/22 02:00	64	5.51	7.71	8.56	11.34	0.00	7.55	0.25	2.49	1.75	1.31	0.10
08/11/22	3:00	08/11/22 03:00	64	5.48	7.63	8.38	11.25	0.00	7.54	0.24	2.50	1.74	1.31	0.11
08/11/22	4:00	08/11/22 04:00	64	5.44	7.61	8.49	11.30	0.00	7.50	0.23	2.48	1.72	1.29	0.15
08/11/22	5:00	08/11/22 05:00	64	5.46	7.65	8.45	11.15	0.00	7.42	0.23	2.44	1.70	1.23	0.05

PID Readings

Date	Time	Date-Time	Wellhead (RW-07)		Blower Effluent		GAC Effluent
			Flow (scfm)	PID (ppm)	Flow (scfm)	PID (ppm)	PID (ppm)
08/10/22	18:00	08/10/22 18:00	46.8	245.9	275.5	285.7	244.7
08/10/22	19:00	08/10/22 19:00	46.9	271.9	276.2	306.6	254.5
08/10/22	20:00	08/10/22 20:00	44.5	366.9	278.1	427.9	328.4
08/10/22	21:00	08/10/22 21:00	44.5	425.6	278.1	445.1	403.3
08/10/22	22:00	08/10/22 22:00	44.4	426	277.3	464.2	424.9
08/10/22	23:00	08/10/22 23:00	44.5	438.8	277.9	479.3	440.9
08/11/22	0:00	08/11/22 00:00	44.5	527.6	278.0	546.4	516.8
08/11/22	1:00	08/11/22 01:00	44.5	528.9	278.0	547.9	522
08/11/22	2:00	08/11/22 02:00	44.5	540.3	278.1	563.7	533.3
08/11/22	3:00	08/11/22 03:00	44.6	537	278.6	551.8	522.5
08/11/22	4:00	08/11/22 04:00	41.7	523.5	278.7	539.3	516.9
08/11/22	5:00	08/11/22 05:00	41.7	519.4	278.7	543	517.4

SVE Pilot Test Data Collection - Constant Rate Test (60 WCI)
Enbridge Energy, Limited Partnership
L13 MP312 Valve Site
Fort Atkinson, Wisconsin

Date: 8/10/2022
Arrival Time: 8:00
Weather: Sunny, high 80's °F
WSP Staff: E. Wesseldyke, C. Hegna

System Operational Measurements

Date	Time	Date-Time	Wellhead (RW-07) Data			VLS Data			Particulate Filter		Blower Inlet		Blower Outlet		GAC Effluent
			Vacuum (WCI)	ΔP (WCI)	Flow (scfm)	Vacuum (WCI)	Temp (°F)	Water Level (in)	Vacuum (WCI)	ΔP (WCI)	ΔP (WCI)	Flow (scfm)	Pressure (WCI)	Temp (°F)	Pressure (psi)
08/11/22	6:00	08/11/22 06:00	64	0.7	41.8	66	66	0	68	0	1.8	278.7	3	125	0
08/11/22	7:00	08/11/22 07:00	64	0.7	41.8	66	66	0	68	0	1.8	278.8	3	125	0
08/11/22	8:00	08/11/22 08:00	64	0.7	41.7	66	68	0	68	0	1.8	278.4	3	130	0
08/11/22	9:00	08/11/22 09:00	64	0.6	38.5	66	70	0	68	0	1.7	270.1	3	130	0
08/11/22	9:55	08/11/22 09:55	End Test at 09:55												

Vacuum Readings (WCI)

Date	Time	Date-Time	RW-07	RW-01	RW-03	RW-05	RW-06	VMP-06	RW-09	VMP-09	RW-11	VMP-11	MW-01-32	MW-14-31
08/11/22	6:00	08/11/22 06:00	64	5.53	7.56	8.35	11.04	0.00	7.39	0.23	2.48	1.71	1.28	0.09
08/11/22	7:00	08/11/22 07:00	64	5.46	7.46	8.34	11.09	0.00	7.30	0.23	2.41	1.65	1.20	0.06
08/11/22	8:00	08/11/22 08:00	64	5.39	7.42	8.17	10.97	0.00	7.23	0.25	2.37	1.65	1.21	0.12
08/11/22	9:00	08/11/22 09:00	64	5.37	7.40	8.25	11.00	0.00	7.29	0.26	2.39	1.64	1.24	0.17
08/11/22	9:55	08/11/22 09:55	End Test at 09:55											

PID Readings

Date	Time	Date-Time	Wellhead (RW-07)		Blower Effluent		GAC Effluent
			Flow (scfm)	PID (ppm)	Flow (scfm)	PID (ppm)	PID (ppm)
08/11/22	6:00	08/11/22 06:00	41.8	522.7	278.7	542.6	521.2
08/11/22	7:00	08/11/22 07:00	41.8	519.6	278.8	539.4	515.7
08/11/22	8:00	08/11/22 08:00	41.7	523.1	278.4	515.2	385.1
08/11/22	9:00	08/11/22 09:00	38.5	404.7	270.1	409.1	392.2
08/11/22	9:55	08/11/22 09:55	End Test at 09:55				

SVE Pilot Test Data Collection - Constant Rate Test (40 WCI)
Enbridge Energy, Limited Partnership
L13 MP312 Valve Site
Fort Atkinson, Wisconsin

Date: 8/11/2022
Arrival Time: 8:00
Weather: Sunny, high 80's °F
WSP Staff: C. Hegna, T. Huff

System Operational Measurements

Date	Time	Date-Time	Wellhead (RW-07) Data			VLS Data			Particulate Filter		Blower Inlet		Blower Outlet		GAC Effluent
			Vacuum (WCI)	ΔP (WCI)	Flow (scfm)	Vacuum (WCI)	Temp (°F)	Water Level (in)	Vacuum (WCI)	ΔP (WCI)	ΔP (WCI)	Flow (scfm)	Pressure (WCI)	Temp (°F)	Pressure (psi)
08/11/22	11:10	08/11/22 11:10	40	0.35	30.2	47.5	80	--	49.5	0	2.5	333.5	4.25	130	0
08/11/22	11:25	08/11/22 11:25	42	0.3	27.9	48	80	--	49	0	2.5	333.7	4	125	0
08/11/22	11:45	08/11/22 11:45	41	0.3	27.9	48	80	--	48	0	2.5	334.1	4	125	0
08/11/22	12:00	08/11/22 12:00	42	0.3	27.9	47.5	80	--	48	0	2.5	334.1	4	130	0
08/11/22	12:15	08/11/22 12:15	41	0.3	27.9	47.5	82	--	49	0	2.5	333.0	4	130	0
08/11/22	12:30	08/11/22 12:30	41	0.3	27.9	47.5	81	--	48	0	2.5	333.8	4	130	0
08/11/22	13:00	08/11/22 13:00	41	0.25	25.3	47.5	88	--	48	0	2.5	331.7	4	130	0
08/11/22	13:30	08/11/22 13:30	41	0.25	25.2	47	91	--	48	0	2.5	330.8	4	130	0
08/11/22	14:00	08/11/22 14:00	41	0.25	25.2	47	92	--	48	0	2.5	330.5	4	130	0
08/11/22	15:00	08/11/22 15:00	41	0.25	25.4	47	82	--	48	0	2.5	333.4	4	130	0
08/11/22	15:10	08/11/22 15:10	End Test at 15:10												

Vacuum Readings (WCI)

Date	Time	Date-Time	RW-07	RW-01	RW-03	RW-05	RW-06	VMP-06	RW-09	VMP-09	RW-11	VMP-11	MW-01-32	MW-14-31
08/11/22	11:10	08/11/22 11:10	40	2.74	4.33	5.38	7.28	0.00	4.96	0.19	1.48	1.03	0.81	0.16
08/11/22	11:25	08/11/22 11:25	42	3.89	5.30	6.04	8.00	0.00	5.29	0.21	1.71	1.21	0.93	0.06
08/11/22	11:45	08/11/22 11:45	41	3.87	5.34	6.01	7.84	0.00	5.26	0.19	1.50	1.20	0.91	0.07
08/11/22	12:00	08/11/22 12:00	42	3.77	5.27	5.90	7.90	0.00	5.27	0.19	1.63	1.19	0.89	0.06
08/11/22	12:15	08/11/22 12:15	41	3.77	5.24	5.82	7.79	0.00	5.21	0.16	1.61	1.15	0.82	0.06
08/11/22	12:30	08/11/22 12:30	41	3.78	5.26	5.85	7.92	0.00	5.21	0.15	1.60	1.13	0.86	0.00
08/11/22	13:00	08/11/22 13:00	41	3.93	5.33	6.02	7.93	0.00	5.33	0.21	1.72	1.26	0.96	0.07
08/11/22	13:30	08/11/22 13:30	41	3.84	5.30	5.91	7.85	0.00	5.17	0.16	1.60	1.14	0.80	0.00
08/11/22	14:00	08/11/22 14:00	41	3.67	5.20	5.80	7.77	0.00	5.25	0.18	1.65	1.21	0.90	0.06
08/11/22	15:00	08/11/22 15:00	41	3.77	5.31	5.89	7.97	0.00	5.30	0.18	1.65	1.19	0.89	0.06
08/11/22	15:10	08/11/22 15:10	End Test at 15:10											

PID Readings

Date	Time	Date-Time	Wellhead (RW-07)		Blower Effluent		GAC Effluent
			Flow (scfm)	PID (ppm)	Flow (scfm)	PID (ppm)	PID (ppm)
08/11/22	11:10	08/11/22 11:10	30.2	371.1	333.5	315.9	290.3
08/11/22	11:25	08/11/22 11:25	27.9	--	333.7	--	--
08/11/22	11:45	08/11/22 11:45	27.9	400.1	334.1	270.3	--
08/11/22	12:00	08/11/22 12:00	27.9	531.8	334.1	408.1	405.4
08/11/22	12:15	08/11/22 12:15	27.9	440.2	333.0	593.2	353.1
08/11/22	12:30	08/11/22 12:30	27.9	619.4	333.8	586.8	576.1
08/11/22	13:00	08/11/22 13:00	25.3	--	331.7	585.7	--
08/11/22	13:30	08/11/22 13:30	25.2	425.1	330.8	378	377.5
08/11/22	14:00	08/11/22 14:00	25.2	551.3	330.5	524.3	527.9
08/11/22	15:00	08/11/22 15:00	25.4	410.9	333.4	386.8	339.9
08/11/22	15:10	08/11/22 15:10	End Test at 15:10				

Wellhead PID measurements were collected at the VLS inlet
Temperature used for flow rate calculations was measured at the VLS inlet
Test started at 11:05 am

B LABORATORY ANALYTICAL REPORTS

07-Sep-2022

Tim Huff
WSP USA
5787 Stadium Drive
Suite D
Kalamazoo, MI 49009

Re: **ENB Line 13 MP 312; 31401967.705B-03.SUB** Work Order: **22080635**

Dear Tim,

ALS Environmental received 4 samples on 16-Aug-2022 03:04 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 34.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Rob Nieman

Electronically approved by: Rob Nieman

Rob Nieman
Project Manager

Report of Laboratory Analysis

ALS Environmental

Date: 07-Sep-22

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: **22080635**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
22080635-01	SVE-1	Air		8/10/2022 12:38	8/16/2022 15:04	☐
22080635-02	SVE-2	Air		8/10/2022 23:36	8/16/2022 15:04	☐
22080635-03	SVE-3	Air		8/11/2022 09:35	8/16/2022 15:04	☐
22080635-04	SVE-4	Air		8/11/2022 09:45	8/16/2022 15:04	☐

ALS Environmental

Date: 07-Sep-22

Client:	WSP USA
Project:	ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order:	22080635

Case Narrative

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

ALS is an EPA recognized NLLAP laboratory for lead paint, soil, and dust wipe analysesThe analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Results relate only to the items tested and are not blank corrected unless indicated.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

ALS is an EPA recognized NLLAP laboratory for lead paint, soil, and dust wipe analyses under its AIHA-LAP accreditation.

These samples have very high concentrations of non target compounds detected. Samples were analyzed multiple times at multiple levels of dilution. Due to the high concentration of these samples some of the internal standard recoveries did not meet method QC criteria. Some results should be considered estimated.

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-1
Lab ID: 22080635-01
Collection Date: 8/10/2022 12:38 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		250	ppbv	500	8/31/2022 05:36 AM
1,1,2,2-Tetrachloroethane	ND		250	ppbv	500	8/31/2022 05:36 AM
1,1,2-Trichloroethane	ND		100	ppbv	500	8/31/2022 05:36 AM
1,1-Dichloroethane	ND		250	ppbv	500	8/31/2022 05:36 AM
1,1-Dichloroethene	ND		250	ppbv	500	8/31/2022 05:36 AM
1,2,4-Trichlorobenzene	ND		250	ppbv	500	8/31/2022 05:36 AM
1,2,4-Trimethylbenzene	**2,700**		**250**	**ppbv**	500	8/31/2022 05:36 AM
1,2-Dibromoethane	ND		100	ppbv	500	8/31/2022 05:36 AM
1,2-Dichlorobenzene	ND		250	ppbv	500	8/31/2022 05:36 AM
1,2-Dichloroethane	ND		100	ppbv	500	8/31/2022 05:36 AM
1,2-Dichloropropane	ND		250	ppbv	500	8/31/2022 05:36 AM
1,3,5-Trimethylbenzene	**1,600**		**250**	**ppbv**	500	8/31/2022 05:36 AM
1,3-Butadiene	ND		100	ppbv	500	8/31/2022 05:36 AM
1,3-Dichlorobenzene	ND		250	ppbv	500	8/31/2022 05:36 AM
1,4-Dichlorobenzene	ND		100	ppbv	500	8/31/2022 05:36 AM
1,4-Dioxane	ND		500	ppbv	500	8/31/2022 05:36 AM
2-Butanone	ND		500	ppbv	500	8/31/2022 05:36 AM
2-Hexanone	ND		500	ppbv	500	8/31/2022 05:36 AM
2-Propanol	ND		500	ppbv	500	8/31/2022 05:36 AM
4-Ethyltoluene	**1,000**		**250**	**ppbv**	500	8/31/2022 05:36 AM
4-Methyl-2-pentanone	ND		500	ppbv	500	8/31/2022 05:36 AM
Acetone	ND		500	ppbv	500	8/31/2022 05:36 AM
Benzene	**600,000**		**80,000**	**ppbv**	2E+05	9/2/2022 05:02 AM
Benzyl chloride	ND		500	ppbv	500	8/31/2022 05:36 AM
Bromodichloromethane	ND		100	ppbv	500	8/31/2022 05:36 AM
Bromoform	ND		250	ppbv	500	8/31/2022 05:36 AM
Bromomethane	ND		250	ppbv	500	8/31/2022 05:36 AM
Carbon disulfide	ND		250	ppbv	500	8/31/2022 05:36 AM
Carbon tetrachloride	ND		250	ppbv	500	8/31/2022 05:36 AM
Chlorobenzene	ND		250	ppbv	500	8/31/2022 05:36 AM
Chloroethane	ND		250	ppbv	500	8/31/2022 05:36 AM
Chloroform	ND		100	ppbv	500	8/31/2022 05:36 AM
Chloromethane	ND		250	ppbv	500	8/31/2022 05:36 AM
cis-1,2-Dichloroethene	ND		250	ppbv	500	8/31/2022 05:36 AM
cis-1,3-Dichloropropene	ND		250	ppbv	500	8/31/2022 05:36 AM
Cumene	**540**		**250**	**ppbv**	500	8/31/2022 05:36 AM
Cyclohexane	**6,700,000**		**320,000**	**ppbv**	6E+05	9/3/2022 07:49 AM
Dibromochloromethane	ND		250	ppbv	500	8/31/2022 05:36 AM
Dichlorodifluoromethane	ND		250	ppbv	500	8/31/2022 05:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-1
Lab ID: 22080635-01
Collection Date: 8/10/2022 12:38 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Ethyl acetate	ND		250	ppbv	500	8/31/2022 05:36 AM
Ethylbenzene	**10,000**		**250**	**ppbv**	500	8/31/2022 05:36 AM
Freon 113	ND		250	ppbv	500	8/31/2022 05:36 AM
Freon 114	ND		250	ppbv	500	8/31/2022 05:36 AM
Heptane	**1,900,000**		**80,000**	**ppbv**	2E+05	9/2/2022 05:02 AM
Hexachlorobutadiene	ND		100	ppbv	500	8/31/2022 05:36 AM
Hexane	**21,000,000**	E	**320,000**	**ppbv**	6E+05	9/3/2022 07:49 AM
m,p-Xylene	**30,000**	E	**250**	**ppbv**	500	8/31/2022 05:36 AM
Methylene chloride	ND		1,000	ppbv	500	8/31/2022 05:36 AM
MTBE	ND		250	ppbv	500	8/31/2022 05:36 AM
Naphthalene	ND		100	ppbv	500	8/31/2022 05:36 AM
o-Xylene	**8,100**		**250**	**ppbv**	500	8/31/2022 05:36 AM
Propene	ND		250	ppbv	500	8/31/2022 05:36 AM
Styrene	ND		250	ppbv	500	8/31/2022 05:36 AM
Tetrachloroethene	ND		250	ppbv	500	8/31/2022 05:36 AM
Tetrahydrofuran	ND		250	ppbv	500	8/31/2022 05:36 AM
Toluene	**170,000**		**80,000**	**ppbv**	2E+05	9/2/2022 05:02 AM
trans-1,2-Dichloroethene	ND		250	ppbv	500	8/31/2022 05:36 AM
trans-1,3-Dichloropropene	ND		250	ppbv	500	8/31/2022 05:36 AM
Trichloroethene	ND		100	ppbv	500	8/31/2022 05:36 AM
Trichlorofluoromethane	ND		250	ppbv	500	8/31/2022 05:36 AM
Vinyl acetate	ND		500	ppbv	500	8/31/2022 05:36 AM
Vinyl chloride	ND		250	ppbv	500	8/31/2022 05:36 AM
Surr: Bromofluorobenzene	*112*		*60-140*	*%REC*	500	8/31/2022 05:36 AM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		1,360	µg/m3	500	8/31/2022 05:36 AM
1,1,2,2-Tetrachloroethane	ND		1,720	µg/m3	500	8/31/2022 05:36 AM
1,1,2-Trichloroethane	ND		546	µg/m3	500	8/31/2022 05:36 AM
1,1-Dichloroethane	ND		1,010	µg/m3	500	8/31/2022 05:36 AM
1,1-Dichloroethene	ND		991	µg/m3	500	8/31/2022 05:36 AM
1,2,4-Trichlorobenzene	ND		1,860	µg/m3	500	8/31/2022 05:36 AM
1,2,4-Trimethylbenzene	**13,100**		**1,230**	**µg/m3**	500	8/31/2022 05:36 AM
1,2-Dibromoethane	ND		768	µg/m3	500	8/31/2022 05:36 AM
1,2-Dichlorobenzene	ND		1,500	µg/m3	500	8/31/2022 05:36 AM
1,2-Dichloroethane	ND		405	µg/m3	500	8/31/2022 05:36 AM
1,2-Dichloropropane	ND		1,160	µg/m3	500	8/31/2022 05:36 AM
1,3,5-Trimethylbenzene	**8,110**		**1,230**	**µg/m3**	500	8/31/2022 05:36 AM
1,3-Butadiene	ND		221	µg/m3	500	8/31/2022 05:36 AM
1,3-Dichlorobenzene	ND		1,500	µg/m3	500	8/31/2022 05:36 AM
1,4-Dichlorobenzene	ND		601	µg/m3	500	8/31/2022 05:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-1
Lab ID: 22080635-01
Collection Date: 8/10/2022 12:38 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
1,4-Dioxane	ND		1,800	µg/m3	500	8/31/2022 05:36 AM
2-Butanone	ND		1,470	µg/m3	500	8/31/2022 05:36 AM
2-Hexanone	ND		2,050	µg/m3	500	8/31/2022 05:36 AM
2-Propanol	ND		1,230	µg/m3	500	8/31/2022 05:36 AM
4-Ethyltoluene	**4,990**		**1,230**	**µg/m3**	500	8/31/2022 05:36 AM
4-Methyl-2-pentanone	ND		2,050	µg/m3	500	8/31/2022 05:36 AM
Acetone	ND		1,190	µg/m3	500	8/31/2022 05:36 AM
Benzene	**1,910,000**		**256,000**	**µg/m3**	2E+05	9/2/2022 05:02 AM
Benzyl chloride	ND		2,590	µg/m3	500	8/31/2022 05:36 AM
Bromodichloromethane	ND		670	µg/m3	500	8/31/2022 05:36 AM
Bromoform	ND		2,580	µg/m3	500	8/31/2022 05:36 AM
Bromomethane	ND		971	µg/m3	500	8/31/2022 05:36 AM
Carbon disulfide	ND		778	µg/m3	500	8/31/2022 05:36 AM
Carbon tetrachloride	ND		1,570	µg/m3	500	8/31/2022 05:36 AM
Chlorobenzene	ND		1,150	µg/m3	500	8/31/2022 05:36 AM
Chloroethane	ND		660	µg/m3	500	8/31/2022 05:36 AM
Chloroform	ND		488	µg/m3	500	8/31/2022 05:36 AM
Chloromethane	ND		516	µg/m3	500	8/31/2022 05:36 AM
cis-1,2-Dichloroethene	ND		991	µg/m3	500	8/31/2022 05:36 AM
cis-1,3-Dichloropropene	ND		1,130	µg/m3	500	8/31/2022 05:36 AM
Cumene	**2,650**		**1,230**	**µg/m3**	500	8/31/2022 05:36 AM
Cyclohexane	**23,100,000**		**1,100,000**	**µg/m3**	6E+05	9/3/2022 07:49 AM
Dibromochloromethane	ND		2,130	µg/m3	500	8/31/2022 05:36 AM
Dichlorodifluoromethane	ND		1,240	µg/m3	500	8/31/2022 05:36 AM
Ethyl acetate	ND		901	µg/m3	500	8/31/2022 05:36 AM
Ethylbenzene	**43,200**		**1,090**	**µg/m3**	500	8/31/2022 05:36 AM
Freon 113	ND		1,920	µg/m3	500	8/31/2022 05:36 AM
Freon 114	ND		1,750	µg/m3	500	8/31/2022 05:36 AM
Heptane	**7,760,000**		**328,000**	**µg/m3**	2E+05	9/2/2022 05:02 AM
Hexachlorobutadiene	ND		1,070	µg/m3	500	8/31/2022 05:36 AM
Hexane	**73,000,000**	E	**1,130,000**	**µg/m3**	6E+05	9/3/2022 07:49 AM
m,p-Xylene	**132,000**	E	**1,090**	**µg/m3**	500	8/31/2022 05:36 AM
Methylene chloride	ND		3,500	µg/m3	500	8/31/2022 05:36 AM
MTBE	ND		901	µg/m3	500	8/31/2022 05:36 AM
Naphthalene	ND		524	µg/m3	500	8/31/2022 05:36 AM
o-Xylene	**35,100**		**1,090**	**µg/m3**	500	8/31/2022 05:36 AM
Propene	ND		430	µg/m3	500	8/31/2022 05:36 AM
Styrene	ND		1,060	µg/m3	500	8/31/2022 05:36 AM
Tetrachloroethene	ND		1,700	µg/m3	500	8/31/2022 05:36 AM
Tetrahydrofuran	ND		737	µg/m3	500	8/31/2022 05:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-1
Lab ID: 22080635-01
Collection Date: 8/10/2022 12:38 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Toluene	**651,000**		**301,000**	**µg/m3**	2E+05	9/2/2022 05:02 AM
trans-1,2-Dichloroethene	ND		991	µg/m3	500	8/31/2022 05:36 AM
trans-1,3-Dichloropropene	ND		1,130	µg/m3	500	8/31/2022 05:36 AM
Trichloroethene	ND		537	µg/m3	500	8/31/2022 05:36 AM
Trichlorofluoromethane	ND		1,400	µg/m3	500	8/31/2022 05:36 AM
Vinyl acetate	ND		1,760	µg/m3	500	8/31/2022 05:36 AM
Vinyl chloride	ND		639	µg/m3	500	8/31/2022 05:36 AM
Surr: Bromofluorobenzene	*112*		*60-140*	*%REC*	500	8/31/2022 05:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-2
Lab ID: 22080635-02
Collection Date: 8/10/2022 11:36 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		250	ppbv	500	8/31/2022 06:54 AM
1,1,2,2-Tetrachloroethane	ND		250	ppbv	500	8/31/2022 06:54 AM
1,1,2-Trichloroethane	ND		100	ppbv	500	8/31/2022 06:54 AM
1,1-Dichloroethane	ND		250	ppbv	500	8/31/2022 06:54 AM
1,1-Dichloroethene	ND		250	ppbv	500	8/31/2022 06:54 AM
1,2,4-Trichlorobenzene	ND		250	ppbv	500	8/31/2022 06:54 AM
1,2,4-Trimethylbenzene	**5,600**		**250**	**ppbv**	500	8/31/2022 06:54 AM
1,2-Dibromoethane	ND		100	ppbv	500	8/31/2022 06:54 AM
1,2-Dichlorobenzene	ND		250	ppbv	500	8/31/2022 06:54 AM
1,2-Dichloroethane	ND		100	ppbv	500	8/31/2022 06:54 AM
1,2-Dichloropropane	ND		250	ppbv	500	8/31/2022 06:54 AM
1,3,5-Trimethylbenzene	**2,900**		**250**	**ppbv**	500	8/31/2022 06:54 AM
1,3-Butadiene	ND		100	ppbv	500	8/31/2022 06:54 AM
1,3-Dichlorobenzene	ND		250	ppbv	500	8/31/2022 06:54 AM
1,4-Dichlorobenzene	ND		100	ppbv	500	8/31/2022 06:54 AM
1,4-Dioxane	ND		500	ppbv	500	8/31/2022 06:54 AM
2-Butanone	ND		500	ppbv	500	8/31/2022 06:54 AM
2-Hexanone	ND		500	ppbv	500	8/31/2022 06:54 AM
2-Propanol	ND		500	ppbv	500	8/31/2022 06:54 AM
4-Ethyltoluene	**1,900**		**250**	**ppbv**	500	8/31/2022 06:54 AM
4-Methyl-2-pentanone	ND		500	ppbv	500	8/31/2022 06:54 AM
Acetone	ND		500	ppbv	500	8/31/2022 06:54 AM
Benzene	**500,000**		**80,000**	**ppbv**	2E+05	9/2/2022 09:16 AM
Benzyl chloride	ND		500	ppbv	500	8/31/2022 06:54 AM
Bromodichloromethane	ND		100	ppbv	500	8/31/2022 06:54 AM
Bromoform	ND		250	ppbv	500	8/31/2022 06:54 AM
Bromomethane	ND		250	ppbv	500	8/31/2022 06:54 AM
Carbon disulfide	ND		250	ppbv	500	8/31/2022 06:54 AM
Carbon tetrachloride	ND		250	ppbv	500	8/31/2022 06:54 AM
Chlorobenzene	ND		250	ppbv	500	8/31/2022 06:54 AM
Chloroethane	ND		250	ppbv	500	8/31/2022 06:54 AM
Chloroform	ND		100	ppbv	500	8/31/2022 06:54 AM
Chloromethane	ND		250	ppbv	500	8/31/2022 06:54 AM
cis-1,2-Dichloroethene	ND		250	ppbv	500	8/31/2022 06:54 AM
cis-1,3-Dichloropropene	ND		250	ppbv	500	8/31/2022 06:54 AM
Cumene	**760**		**250**	**ppbv**	500	8/31/2022 06:54 AM
Cyclohexane	**2,200,000**		**80,000**	**ppbv**	2E+05	9/2/2022 09:16 AM
Dibromochloromethane	ND		250	ppbv	500	8/31/2022 06:54 AM
Dichlorodifluoromethane	ND		250	ppbv	500	8/31/2022 06:54 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB **Work Order:** 22080635
Sample ID: SVE-2 **Lab ID:** 22080635-02
Collection Date: 8/10/2022 11:36 PM **Matrix:** AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Ethyl acetate	ND		250	ppbv	500	8/31/2022 06:54 AM
Ethylbenzene	**9,100**		**250**	**ppbv**	500	8/31/2022 06:54 AM
Freon 113	ND		250	ppbv	500	8/31/2022 06:54 AM
Freon 114	ND		250	ppbv	500	8/31/2022 06:54 AM
Heptane	**1,200,000**		**80,000**	**ppbv**	2E+05	9/2/2022 09:16 AM
Hexachlorobutadiene	ND		100	ppbv	500	8/31/2022 06:54 AM
Hexane	**12,000,000**		**320,000**	**ppbv**	6E+05	9/3/2022 07:03 AM
m,p-Xylene	**27,000**	E	**250**	**ppbv**	500	8/31/2022 06:54 AM
Methylene chloride	ND		1,000	ppbv	500	8/31/2022 06:54 AM
MTBE	ND		250	ppbv	500	8/31/2022 06:54 AM
Naphthalene	ND		100	ppbv	500	8/31/2022 06:54 AM
o-Xylene	**9,200**		**250**	**ppbv**	500	8/31/2022 06:54 AM
Propene	ND		250	ppbv	500	8/31/2022 06:54 AM
Styrene	ND		250	ppbv	500	8/31/2022 06:54 AM
Tetrachloroethene	ND		250	ppbv	500	8/31/2022 06:54 AM
Tetrahydrofuran	ND		250	ppbv	500	8/31/2022 06:54 AM
Toluene	**180,000**		**80,000**	**ppbv**	2E+05	9/2/2022 09:16 AM
trans-1,2-Dichloroethene	ND		250	ppbv	500	8/31/2022 06:54 AM
trans-1,3-Dichloropropene	ND		250	ppbv	500	8/31/2022 06:54 AM
Trichloroethene	ND		100	ppbv	500	8/31/2022 06:54 AM
Trichlorofluoromethane	ND		250	ppbv	500	8/31/2022 06:54 AM
Vinyl acetate	ND		500	ppbv	500	8/31/2022 06:54 AM
Vinyl chloride	ND		250	ppbv	500	8/31/2022 06:54 AM
Surr: Bromofluorobenzene	*108*		*60-140*	*%REC*	500	8/31/2022 06:54 AM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		1,360	µg/m3	500	8/31/2022 06:54 AM
1,1,2,2-Tetrachloroethane	ND		1,720	µg/m3	500	8/31/2022 06:54 AM
1,1,2-Trichloroethane	ND		546	µg/m3	500	8/31/2022 06:54 AM
1,1-Dichloroethane	ND		1,010	µg/m3	500	8/31/2022 06:54 AM
1,1-Dichloroethene	ND		991	µg/m3	500	8/31/2022 06:54 AM
1,2,4-Trichlorobenzene	ND		1,860	µg/m3	500	8/31/2022 06:54 AM
1,2,4-Trimethylbenzene	**27,700**		**1,230**	**µg/m3**	500	8/31/2022 06:54 AM
1,2-Dibromoethane	ND		768	µg/m3	500	8/31/2022 06:54 AM
1,2-Dichlorobenzene	ND		1,500	µg/m3	500	8/31/2022 06:54 AM
1,2-Dichloroethane	ND		405	µg/m3	500	8/31/2022 06:54 AM
1,2-Dichloropropane	ND		1,160	µg/m3	500	8/31/2022 06:54 AM
1,3,5-Trimethylbenzene	**14,300**		**1,230**	**µg/m3**	500	8/31/2022 06:54 AM
1,3-Butadiene	ND		221	µg/m3	500	8/31/2022 06:54 AM
1,3-Dichlorobenzene	ND		1,500	µg/m3	500	8/31/2022 06:54 AM
1,4-Dichlorobenzene	ND		601	µg/m3	500	8/31/2022 06:54 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-2
Lab ID: 22080635-02
Collection Date: 8/10/2022 11:36 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
1,4-Dioxane	ND		1,800	µg/m3	500	8/31/2022 06:54 AM
2-Butanone	ND		1,470	µg/m3	500	8/31/2022 06:54 AM
2-Hexanone	ND		2,050	µg/m3	500	8/31/2022 06:54 AM
2-Propanol	ND		1,230	µg/m3	500	8/31/2022 06:54 AM
4-Ethyltoluene	**9,460**		**1,230**	**µg/m3**	500	8/31/2022 06:54 AM
4-Methyl-2-pentanone	ND		2,050	µg/m3	500	8/31/2022 06:54 AM
Acetone	ND		1,190	µg/m3	500	8/31/2022 06:54 AM
Benzene	**1,590,000**		**256,000**	**µg/m3**	2E+05	9/2/2022 09:16 AM
Benzyl chloride	ND		2,590	µg/m3	500	8/31/2022 06:54 AM
Bromodichloromethane	ND		670	µg/m3	500	8/31/2022 06:54 AM
Bromoform	ND		2,580	µg/m3	500	8/31/2022 06:54 AM
Bromomethane	ND		971	µg/m3	500	8/31/2022 06:54 AM
Carbon disulfide	ND		778	µg/m3	500	8/31/2022 06:54 AM
Carbon tetrachloride	ND		1,570	µg/m3	500	8/31/2022 06:54 AM
Chlorobenzene	ND		1,150	µg/m3	500	8/31/2022 06:54 AM
Chloroethane	ND		660	µg/m3	500	8/31/2022 06:54 AM
Chloroform	ND		488	µg/m3	500	8/31/2022 06:54 AM
Chloromethane	ND		516	µg/m3	500	8/31/2022 06:54 AM
cis-1,2-Dichloroethene	ND		991	µg/m3	500	8/31/2022 06:54 AM
cis-1,3-Dichloropropene	ND		1,130	µg/m3	500	8/31/2022 06:54 AM
Cumene	**3,740**		**1,230**	**µg/m3**	500	8/31/2022 06:54 AM
Cyclohexane	**7,470,000**		**275,000**	**µg/m3**	2E+05	9/2/2022 09:16 AM
Dibromochloromethane	ND		2,130	µg/m3	500	8/31/2022 06:54 AM
Dichlorodifluoromethane	ND		1,240	µg/m3	500	8/31/2022 06:54 AM
Ethyl acetate	ND		901	µg/m3	500	8/31/2022 06:54 AM
Ethylbenzene	**39,500**		**1,090**	**µg/m3**	500	8/31/2022 06:54 AM
Freon 113	ND		1,920	µg/m3	500	8/31/2022 06:54 AM
Freon 114	ND		1,750	µg/m3	500	8/31/2022 06:54 AM
Heptane	**4,710,000**		**328,000**	**µg/m3**	2E+05	9/2/2022 09:16 AM
Hexachlorobutadiene	ND		1,070	µg/m3	500	8/31/2022 06:54 AM
Hexane	**42,500,000**		**1,130,000**	**µg/m3**	6E+05	9/3/2022 07:03 AM
m,p-Xylene	**116,000**	E	**1,090**	**µg/m3**	500	8/31/2022 06:54 AM
Methylene chloride	ND		3,500	µg/m3	500	8/31/2022 06:54 AM
MTBE	ND		901	µg/m3	500	8/31/2022 06:54 AM
Naphthalene	ND		524	µg/m3	500	8/31/2022 06:54 AM
o-Xylene	**39,900**		**1,090**	**µg/m3**	500	8/31/2022 06:54 AM
Propene	ND		430	µg/m3	500	8/31/2022 06:54 AM
Styrene	ND		1,060	µg/m3	500	8/31/2022 06:54 AM
Tetrachloroethene	ND		1,700	µg/m3	500	8/31/2022 06:54 AM
Tetrahydrofuran	ND		737	µg/m3	500	8/31/2022 06:54 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-2
Lab ID: 22080635-02
Collection Date: 8/10/2022 11:36 PM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Toluene	**693,000**		**301,000**	**µg/m3**	2E+05	9/2/2022 09:16 AM
trans-1,2-Dichloroethene	ND		991	µg/m3	500	8/31/2022 06:54 AM
trans-1,3-Dichloropropene	ND		1,130	µg/m3	500	8/31/2022 06:54 AM
Trichloroethene	ND		537	µg/m3	500	8/31/2022 06:54 AM
Trichlorofluoromethane	ND		1,400	µg/m3	500	8/31/2022 06:54 AM
Vinyl acetate	ND		1,760	µg/m3	500	8/31/2022 06:54 AM
Vinyl chloride	ND		639	µg/m3	500	8/31/2022 06:54 AM
Surr: Bromofluorobenzene	*108*		*60-140*	*%REC*	500	8/31/2022 06:54 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-3
Lab ID: 22080635-03
Collection Date: 8/11/2022 09:35 AM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		250	ppbv	500	8/31/2022 11:36 AM
1,1,2,2-Tetrachloroethane	ND		250	ppbv	500	8/31/2022 11:36 AM
1,1,2-Trichloroethane	ND		100	ppbv	500	8/31/2022 11:36 AM
1,1-Dichloroethane	ND		250	ppbv	500	8/31/2022 11:36 AM
1,1-Dichloroethene	ND		250	ppbv	500	8/31/2022 11:36 AM
1,2,4-Trichlorobenzene	ND		250	ppbv	500	8/31/2022 11:36 AM
1,2,4-Trimethylbenzene	**6,100**		**250**	**ppbv**	500	8/31/2022 11:36 AM
1,2-Dibromoethane	ND		100	ppbv	500	8/31/2022 11:36 AM
1,2-Dichlorobenzene	ND		250	ppbv	500	8/31/2022 11:36 AM
1,2-Dichloroethane	ND		100	ppbv	500	8/31/2022 11:36 AM
1,2-Dichloropropane	ND		250	ppbv	500	8/31/2022 11:36 AM
1,3,5-Trimethylbenzene	**2,900**		**250**	**ppbv**	500	8/31/2022 11:36 AM
1,3-Butadiene	ND		100	ppbv	500	8/31/2022 11:36 AM
1,3-Dichlorobenzene	ND		250	ppbv	500	8/31/2022 11:36 AM
1,4-Dichlorobenzene	ND		100	ppbv	500	8/31/2022 11:36 AM
1,4-Dioxane	ND		500	ppbv	500	8/31/2022 11:36 AM
2-Butanone	ND		500	ppbv	500	8/31/2022 11:36 AM
2-Hexanone	ND		500	ppbv	500	8/31/2022 11:36 AM
2-Propanol	ND		500	ppbv	500	8/31/2022 11:36 AM
4-Ethyltoluene	**1,900**		**250**	**ppbv**	500	8/31/2022 11:36 AM
4-Methyl-2-pentanone	ND		500	ppbv	500	8/31/2022 11:36 AM
Acetone	ND		500	ppbv	500	8/31/2022 11:36 AM
Benzene	**490,000**		**80,000**	**ppbv**	2E+05	9/2/2022 10:03 AM
Benzyl chloride	ND		500	ppbv	500	8/31/2022 11:36 AM
Bromodichloromethane	ND		100	ppbv	500	8/31/2022 11:36 AM
Bromoform	ND		250	ppbv	500	8/31/2022 11:36 AM
Bromomethane	ND		250	ppbv	500	8/31/2022 11:36 AM
Carbon disulfide	ND		250	ppbv	500	8/31/2022 11:36 AM
Carbon tetrachloride	ND		250	ppbv	500	8/31/2022 11:36 AM
Chlorobenzene	ND		250	ppbv	500	8/31/2022 11:36 AM
Chloroethane	ND		250	ppbv	500	8/31/2022 11:36 AM
Chloroform	ND		100	ppbv	500	8/31/2022 11:36 AM
Chloromethane	ND		250	ppbv	500	8/31/2022 11:36 AM
cis-1,2-Dichloroethene	ND		250	ppbv	500	8/31/2022 11:36 AM
cis-1,3-Dichloropropene	ND		250	ppbv	500	8/31/2022 11:36 AM
Cumene	**620**		**250**	**ppbv**	500	8/31/2022 11:36 AM
Cyclohexane	**2,100,000**		**80,000**	**ppbv**	2E+05	9/2/2022 10:03 AM
Dibromochloromethane	ND		250	ppbv	500	8/31/2022 11:36 AM
Dichlorodifluoromethane	ND		250	ppbv	500	8/31/2022 11:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB **Work Order:** 22080635
Sample ID: SVE-3 **Lab ID:** 22080635-03
Collection Date: 8/11/2022 09:35 AM **Matrix:** AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Ethyl acetate	ND		250	ppbv	500	8/31/2022 11:36 AM
Ethylbenzene	**8,200**		**250**	**ppbv**	500	8/31/2022 11:36 AM
Freon 113	ND		250	ppbv	500	8/31/2022 11:36 AM
Freon 114	ND		250	ppbv	500	8/31/2022 11:36 AM
Heptane	**1,200,000**		**80,000**	**ppbv**	2E+05	9/2/2022 10:03 AM
Hexachlorobutadiene	ND		100	ppbv	500	8/31/2022 11:36 AM
Hexane	**12,000,000**		**320,000**	**ppbv**	6E+05	9/3/2022 06:17 AM
m,p-Xylene	**26,000**	E	**250**	**ppbv**	500	8/31/2022 11:36 AM
Methylene chloride	ND		1,000	ppbv	500	8/31/2022 11:36 AM
MTBE	ND		250	ppbv	500	8/31/2022 11:36 AM
Naphthalene	ND		100	ppbv	500	8/31/2022 11:36 AM
o-Xylene	**8,000**		**250**	**ppbv**	500	8/31/2022 11:36 AM
Propene	ND		250	ppbv	500	8/31/2022 11:36 AM
Styrene	ND		250	ppbv	500	8/31/2022 11:36 AM
Tetrachloroethene	ND		250	ppbv	500	8/31/2022 11:36 AM
Tetrahydrofuran	ND		250	ppbv	500	8/31/2022 11:36 AM
Toluene	**200,000**		**80,000**	**ppbv**	2E+05	9/2/2022 10:03 AM
trans-1,2-Dichloroethene	ND		250	ppbv	500	8/31/2022 11:36 AM
trans-1,3-Dichloropropene	ND		250	ppbv	500	8/31/2022 11:36 AM
Trichloroethene	ND		100	ppbv	500	8/31/2022 11:36 AM
Trichlorofluoromethane	ND		250	ppbv	500	8/31/2022 11:36 AM
Vinyl acetate	ND		500	ppbv	500	8/31/2022 11:36 AM
Vinyl chloride	ND		250	ppbv	500	8/31/2022 11:36 AM
Surr: Bromofluorobenzene	*107*		*60-140*	*%REC*	500	8/31/2022 11:36 AM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		1,360	µg/m3	500	8/31/2022 11:36 AM
1,1,2,2-Tetrachloroethane	ND		1,720	µg/m3	500	8/31/2022 11:36 AM
1,1,2-Trichloroethane	ND		546	µg/m3	500	8/31/2022 11:36 AM
1,1-Dichloroethane	ND		1,010	µg/m3	500	8/31/2022 11:36 AM
1,1-Dichloroethene	ND		991	µg/m3	500	8/31/2022 11:36 AM
1,2,4-Trichlorobenzene	ND		1,860	µg/m3	500	8/31/2022 11:36 AM
1,2,4-Trimethylbenzene	**30,100**		**1,230**	**µg/m3**	500	8/31/2022 11:36 AM
1,2-Dibromoethane	ND		768	µg/m3	500	8/31/2022 11:36 AM
1,2-Dichlorobenzene	ND		1,500	µg/m3	500	8/31/2022 11:36 AM
1,2-Dichloroethane	ND		405	µg/m3	500	8/31/2022 11:36 AM
1,2-Dichloropropane	ND		1,160	µg/m3	500	8/31/2022 11:36 AM
1,3,5-Trimethylbenzene	**14,300**		**1,230**	**µg/m3**	500	8/31/2022 11:36 AM
1,3-Butadiene	ND		221	µg/m3	500	8/31/2022 11:36 AM
1,3-Dichlorobenzene	ND		1,500	µg/m3	500	8/31/2022 11:36 AM
1,4-Dichlorobenzene	ND		601	µg/m3	500	8/31/2022 11:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-3
Lab ID: 22080635-03
Collection Date: 8/11/2022 09:35 AM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
1,4-Dioxane	ND		1,800	µg/m3	500	8/31/2022 11:36 AM
2-Butanone	ND		1,470	µg/m3	500	8/31/2022 11:36 AM
2-Hexanone	ND		2,050	µg/m3	500	8/31/2022 11:36 AM
2-Propanol	ND		1,230	µg/m3	500	8/31/2022 11:36 AM
4-Ethyltoluene	**9,190**		**1,230**	**µg/m3**	500	8/31/2022 11:36 AM
4-Methyl-2-pentanone	ND		2,050	µg/m3	500	8/31/2022 11:36 AM
Acetone	ND		1,190	µg/m3	500	8/31/2022 11:36 AM
Benzene	**1,560,000**		**256,000**	**µg/m3**	2E+05	9/2/2022 10:03 AM
Benzyl chloride	ND		2,590	µg/m3	500	8/31/2022 11:36 AM
Bromodichloromethane	ND		670	µg/m3	500	8/31/2022 11:36 AM
Bromoform	ND		2,580	µg/m3	500	8/31/2022 11:36 AM
Bromomethane	ND		971	µg/m3	500	8/31/2022 11:36 AM
Carbon disulfide	ND		778	µg/m3	500	8/31/2022 11:36 AM
Carbon tetrachloride	ND		1,570	µg/m3	500	8/31/2022 11:36 AM
Chlorobenzene	ND		1,150	µg/m3	500	8/31/2022 11:36 AM
Chloroethane	ND		660	µg/m3	500	8/31/2022 11:36 AM
Chloroform	ND		488	µg/m3	500	8/31/2022 11:36 AM
Chloromethane	ND		516	µg/m3	500	8/31/2022 11:36 AM
cis-1,2-Dichloroethene	ND		991	µg/m3	500	8/31/2022 11:36 AM
cis-1,3-Dichloropropene	ND		1,130	µg/m3	500	8/31/2022 11:36 AM
Cumene	**3,020**		**1,230**	**µg/m3**	500	8/31/2022 11:36 AM
Cyclohexane	**7,090,000**		**275,000**	**µg/m3**	2E+05	9/2/2022 10:03 AM
Dibromochloromethane	ND		2,130	µg/m3	500	8/31/2022 11:36 AM
Dichlorodifluoromethane	ND		1,240	µg/m3	500	8/31/2022 11:36 AM
Ethyl acetate	ND		901	µg/m3	500	8/31/2022 11:36 AM
Ethylbenzene	**35,700**		**1,090**	**µg/m3**	500	8/31/2022 11:36 AM
Freon 113	ND		1,920	µg/m3	500	8/31/2022 11:36 AM
Freon 114	ND		1,750	µg/m3	500	8/31/2022 11:36 AM
Heptane	**4,820,000**		**328,000**	**µg/m3**	2E+05	9/2/2022 10:03 AM
Hexachlorobutadiene	ND		1,070	µg/m3	500	8/31/2022 11:36 AM
Hexane	**43,000,000**		**1,130,000**	**µg/m3**	6E+05	9/3/2022 06:17 AM
m,p-Xylene	**114,000**	E	**1,090**	**µg/m3**	500	8/31/2022 11:36 AM
Methylene chloride	ND		3,500	µg/m3	500	8/31/2022 11:36 AM
MTBE	ND		901	µg/m3	500	8/31/2022 11:36 AM
Naphthalene	ND		524	µg/m3	500	8/31/2022 11:36 AM
o-Xylene	**34,700**		**1,090**	**µg/m3**	500	8/31/2022 11:36 AM
Propene	ND		430	µg/m3	500	8/31/2022 11:36 AM
Styrene	ND		1,060	µg/m3	500	8/31/2022 11:36 AM
Tetrachloroethene	ND		1,700	µg/m3	500	8/31/2022 11:36 AM
Tetrahydrofuran	ND		737	µg/m3	500	8/31/2022 11:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-3
Lab ID: 22080635-03
Collection Date: 8/11/2022 09:35 AM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Toluene	**736,000**		**301,000**	**µg/m3**	2E+05	9/2/2022 10:03 AM
trans-1,2-Dichloroethene	ND		991	µg/m3	500	8/31/2022 11:36 AM
trans-1,3-Dichloropropene	ND		1,130	µg/m3	500	8/31/2022 11:36 AM
Trichloroethene	ND		537	µg/m3	500	8/31/2022 11:36 AM
Trichlorofluoromethane	ND		1,400	µg/m3	500	8/31/2022 11:36 AM
Vinyl acetate	ND		1,760	µg/m3	500	8/31/2022 11:36 AM
Vinyl chloride	ND		639	µg/m3	500	8/31/2022 11:36 AM
Surr: Bromofluorobenzene	*107*		*60-140*	*%REC*	500	8/31/2022 11:36 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-4
Lab ID: 22080635-04
Collection Date: 8/11/2022 09:45 AM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		250	ppbv	500	9/3/2022 08:35 AM
1,1,2,2-Tetrachloroethane	ND		250	ppbv	500	9/3/2022 08:35 AM
1,1,2-Trichloroethane	ND		100	ppbv	500	9/3/2022 08:35 AM
1,1-Dichloroethane	ND		250	ppbv	500	9/3/2022 08:35 AM
1,1-Dichloroethene	ND		250	ppbv	500	9/3/2022 08:35 AM
1,2,4-Trichlorobenzene	ND		250	ppbv	500	9/3/2022 08:35 AM
1,2,4-Trimethylbenzene	ND		250	ppbv	500	9/3/2022 08:35 AM
1,2-Dibromoethane	ND		100	ppbv	500	9/3/2022 08:35 AM
1,2-Dichlorobenzene	ND		250	ppbv	500	9/3/2022 08:35 AM
1,2-Dichloroethane	ND		100	ppbv	500	9/3/2022 08:35 AM
1,2-Dichloropropane	ND		250	ppbv	500	9/3/2022 08:35 AM
1,3,5-Trimethylbenzene	ND		250	ppbv	500	9/3/2022 08:35 AM
1,3-Butadiene	ND		100	ppbv	500	9/3/2022 08:35 AM
1,3-Dichlorobenzene	ND		250	ppbv	500	9/3/2022 08:35 AM
1,4-Dichlorobenzene	ND		100	ppbv	500	9/3/2022 08:35 AM
1,4-Dioxane	ND		500	ppbv	500	9/3/2022 08:35 AM
2-Butanone	ND		500	ppbv	500	9/3/2022 08:35 AM
2-Hexanone	ND		500	ppbv	500	9/3/2022 08:35 AM
2-Propanol	ND		500	ppbv	500	9/3/2022 08:35 AM
4-Ethyltoluene	ND		250	ppbv	500	9/3/2022 08:35 AM
4-Methyl-2-pentanone	ND		500	ppbv	500	9/3/2022 08:35 AM
Acetone	ND		500	ppbv	500	9/3/2022 08:35 AM
Benzene	**87,000**		**20,000**	**ppbv**	40000	9/2/2022 10:49 AM
Benzyl chloride	ND		500	ppbv	500	9/3/2022 08:35 AM
Bromodichloromethane	ND		100	ppbv	500	9/3/2022 08:35 AM
Bromoform	ND		250	ppbv	500	9/3/2022 08:35 AM
Bromomethane	ND		250	ppbv	500	9/3/2022 08:35 AM
Carbon disulfide	ND		250	ppbv	500	9/3/2022 08:35 AM
Carbon tetrachloride	ND		250	ppbv	500	9/3/2022 08:35 AM
Chlorobenzene	ND		250	ppbv	500	9/3/2022 08:35 AM
Chloroethane	ND		250	ppbv	500	9/3/2022 08:35 AM
Chloroform	ND		100	ppbv	500	9/3/2022 08:35 AM
Chloromethane	ND		250	ppbv	500	9/3/2022 08:35 AM
cis-1,2-Dichloroethene	ND		250	ppbv	500	9/3/2022 08:35 AM
cis-1,3-Dichloropropene	ND		250	ppbv	500	9/3/2022 08:35 AM
Cumene	ND		250	ppbv	500	9/3/2022 08:35 AM
Cyclohexane	**440,000**		**80,000**	**ppbv**	2E+05	9/2/2022 11:35 AM
Dibromochloromethane	ND		250	ppbv	500	9/3/2022 08:35 AM
Dichlorodifluoromethane	ND		250	ppbv	500	9/3/2022 08:35 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB **Work Order:** 22080635
Sample ID: SVE-4 **Lab ID:** 22080635-04
Collection Date: 8/11/2022 09:45 AM **Matrix:** AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Ethyl acetate	ND		250	ppbv	500	9/3/2022 08:35 AM
Ethylbenzene	ND		250	ppbv	500	9/3/2022 08:35 AM
Freon 113	ND		250	ppbv	500	9/3/2022 08:35 AM
Freon 114	ND		250	ppbv	500	9/3/2022 08:35 AM
Heptane	**130,000**		**80,000**	**ppbv**	2E+05	9/2/2022 11:35 AM
Hexachlorobutadiene	ND		100	ppbv	500	9/3/2022 08:35 AM
Hexane	**1,900,000**		**80,000**	**ppbv**	2E+05	9/2/2022 11:35 AM
m,p-Xylene	ND		250	ppbv	500	9/3/2022 08:35 AM
Methylene chloride	ND		1,000	ppbv	500	9/3/2022 08:35 AM
MTBE	ND		250	ppbv	500	9/3/2022 08:35 AM
Naphthalene	ND		100	ppbv	500	9/3/2022 08:35 AM
o-Xylene	ND		250	ppbv	500	9/3/2022 08:35 AM
Propene	ND		250	ppbv	500	9/3/2022 08:35 AM
Styrene	ND		250	ppbv	500	9/3/2022 08:35 AM
Tetrachloroethene	ND		250	ppbv	500	9/3/2022 08:35 AM
Tetrahydrofuran	ND		250	ppbv	500	9/3/2022 08:35 AM
Toluene	ND		250	ppbv	500	9/3/2022 08:35 AM
trans-1,2-Dichloroethene	ND		250	ppbv	500	9/3/2022 08:35 AM
trans-1,3-Dichloropropene	ND		250	ppbv	500	9/3/2022 08:35 AM
Trichloroethene	ND		100	ppbv	500	9/3/2022 08:35 AM
Trichlorofluoromethane	ND		250	ppbv	500	9/3/2022 08:35 AM
Vinyl acetate	ND		500	ppbv	500	9/3/2022 08:35 AM
Vinyl chloride	ND		250	ppbv	500	9/3/2022 08:35 AM
Surr: Bromofluorobenzene	*93.0*		*60-140*	*%REC*	500	9/3/2022 08:35 AM
TO-15 BY GC/MS			**ETO-15**			Analyst: **MRJ**
1,1,1-Trichloroethane	ND		1,360	µg/m3	500	9/3/2022 08:35 AM
1,1,2,2-Tetrachloroethane	ND		1,720	µg/m3	500	9/3/2022 08:35 AM
1,1,2-Trichloroethane	ND		546	µg/m3	500	9/3/2022 08:35 AM
1,1-Dichloroethane	ND		1,010	µg/m3	500	9/3/2022 08:35 AM
1,1-Dichloroethene	ND		991	µg/m3	500	9/3/2022 08:35 AM
1,2,4-Trichlorobenzene	ND		1,860	µg/m3	500	9/3/2022 08:35 AM
1,2,4-Trimethylbenzene	ND		1,230	µg/m3	500	9/3/2022 08:35 AM
1,2-Dibromoethane	ND		768	µg/m3	500	9/3/2022 08:35 AM
1,2-Dichlorobenzene	ND		1,500	µg/m3	500	9/3/2022 08:35 AM
1,2-Dichloroethane	ND		405	µg/m3	500	9/3/2022 08:35 AM
1,2-Dichloropropane	ND		1,160	µg/m3	500	9/3/2022 08:35 AM
1,3,5-Trimethylbenzene	ND		1,230	µg/m3	500	9/3/2022 08:35 AM
1,3-Butadiene	ND		221	µg/m3	500	9/3/2022 08:35 AM
1,3-Dichlorobenzene	ND		1,500	µg/m3	500	9/3/2022 08:35 AM
1,4-Dichlorobenzene	ND		601	µg/m3	500	9/3/2022 08:35 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-4
Lab ID: 22080635-04
Collection Date: 8/11/2022 09:45 AM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
1,4-Dioxane	ND		1,800	µg/m3	500	9/3/2022 08:35 AM
2-Butanone	ND		1,470	µg/m3	500	9/3/2022 08:35 AM
2-Hexanone	ND		2,050	µg/m3	500	9/3/2022 08:35 AM
2-Propanol	ND		1,230	µg/m3	500	9/3/2022 08:35 AM
4-Ethyltoluene	ND		1,230	µg/m3	500	9/3/2022 08:35 AM
4-Methyl-2-pentanone	ND		2,050	µg/m3	500	9/3/2022 08:35 AM
Acetone	ND		1,190	µg/m3	500	9/3/2022 08:35 AM
Benzene	**277,000**		**63,900**	**µg/m3**	40000	9/2/2022 10:49 AM
Benzyl chloride	ND		2,590	µg/m3	500	9/3/2022 08:35 AM
Bromodichloromethane	ND		670	µg/m3	500	9/3/2022 08:35 AM
Bromoform	ND		2,580	µg/m3	500	9/3/2022 08:35 AM
Bromomethane	ND		971	µg/m3	500	9/3/2022 08:35 AM
Carbon disulfide	ND		778	µg/m3	500	9/3/2022 08:35 AM
Carbon tetrachloride	ND		1,570	µg/m3	500	9/3/2022 08:35 AM
Chlorobenzene	ND		1,150	µg/m3	500	9/3/2022 08:35 AM
Chloroethane	ND		660	µg/m3	500	9/3/2022 08:35 AM
Chloroform	ND		488	µg/m3	500	9/3/2022 08:35 AM
Chloromethane	ND		516	µg/m3	500	9/3/2022 08:35 AM
cis-1,2-Dichloroethene	ND		991	µg/m3	500	9/3/2022 08:35 AM
cis-1,3-Dichloropropene	ND		1,130	µg/m3	500	9/3/2022 08:35 AM
Cumene	ND		1,230	µg/m3	500	9/3/2022 08:35 AM
Cyclohexane	**1,520,000**		**275,000**	**µg/m3**	2E+05	9/2/2022 11:35 AM
Dibromochloromethane	ND		2,130	µg/m3	500	9/3/2022 08:35 AM
Dichlorodifluoromethane	ND		1,240	µg/m3	500	9/3/2022 08:35 AM
Ethyl acetate	ND		901	µg/m3	500	9/3/2022 08:35 AM
Ethylbenzene	ND		1,090	µg/m3	500	9/3/2022 08:35 AM
Freon 113	ND		1,920	µg/m3	500	9/3/2022 08:35 AM
Freon 114	ND		1,750	µg/m3	500	9/3/2022 08:35 AM
Heptane	**531,000**		**328,000**	**µg/m3**	2E+05	9/2/2022 11:35 AM
Hexachlorobutadiene	ND		1,070	µg/m3	500	9/3/2022 08:35 AM
Hexane	**6,690,000**		**282,000**	**µg/m3**	2E+05	9/2/2022 11:35 AM
m,p-Xylene	ND		1,090	µg/m3	500	9/3/2022 08:35 AM
Methylene chloride	ND		3,500	µg/m3	500	9/3/2022 08:35 AM
MTBE	ND		901	µg/m3	500	9/3/2022 08:35 AM
Naphthalene	ND		524	µg/m3	500	9/3/2022 08:35 AM
o-Xylene	ND		1,090	µg/m3	500	9/3/2022 08:35 AM
Propene	ND		430	µg/m3	500	9/3/2022 08:35 AM
Styrene	ND		1,060	µg/m3	500	9/3/2022 08:35 AM
Tetrachloroethene	ND		1,700	µg/m3	500	9/3/2022 08:35 AM
Tetrahydrofuran	ND		737	µg/m3	500	9/3/2022 08:35 AM

Note:

ALS Environmental

Date: *07-Sep-22*

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
Work Order: 22080635
Sample ID: SVE-4
Lab ID: 22080635-04
Collection Date: 8/11/2022 09:45 AM
Matrix: AIR

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Toluene	ND		942	µg/m3	500	9/3/2022 08:35 AM
trans-1,2-Dichloroethene	ND		991	µg/m3	500	9/3/2022 08:35 AM
trans-1,3-Dichloropropene	ND		1,130	µg/m3	500	9/3/2022 08:35 AM
Trichloroethene	ND		537	µg/m3	500	9/3/2022 08:35 AM
Trichlorofluoromethane	ND		1,400	µg/m3	500	9/3/2022 08:35 AM
Vinyl acetate	ND		1,760	µg/m3	500	9/3/2022 08:35 AM
Vinyl chloride	ND		639	µg/m3	500	9/3/2022 08:35 AM
Surr: Bromofluorobenzene	*93.0*		*60-140*	*%REC*	500	9/3/2022 08:35 AM

Note:

Batch ID: **R207725** Instrument ID: **VMS4** Method: **ETO-15**

MBLK	Sample ID: **mblk-R207725**				Units: **ppbv**			Analysis Date: **8/30/2022 03:36 PM**		
Client ID:		Run ID: **VMS4_220830A**			SeqNo: **2834308**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.20								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2,4-Trichlorobenzene	ND	0.50								
1,2,4-Trimethylbenzene	ND	0.50								
1,2-Dibromoethane	ND	0.20								
1,2-Dichlorobenzene	ND	0.50								
1,2-Dichloroethane	ND	0.20								
1,2-Dichloropropane	ND	0.50								
1,3,5-Trimethylbenzene	ND	0.50								
1,3-Butadiene	ND	0.20								
1,3-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.20								
1,4-Dioxane	ND	1.0								
2-Butanone	ND	1.0								
2-Hexanone	ND	1.0								
2-Propanol	ND	1.0								
4-Ethyltoluene	ND	0.50								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	1.0								
Benzene	ND	0.50								
Benzyl chloride	ND	1.0								
Bromodichloromethane	ND	0.20								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.20								
Chloromethane	ND	0.50								
cis-1,2-Dichloroethene	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
Cumene	ND	0.50								
Cyclohexane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
Ethyl acetate	ND	0.50								
Ethylbenzene	ND	0.50								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R207725** Instrument ID: **VMS4** Method: **ETO-15**

Freon 113	ND	0.50					
Freon 114	ND	0.50					
Heptane	ND	0.50					
Hexachlorobutadiene	ND	0.20					
Hexane	ND	0.50					
m,p-Xylene	ND	0.50					
Methylene chloride	ND	2.0					
MTBE	ND	0.50					
Naphthalene	ND	0.20					
o-Xylene	ND	0.50					
Propene	ND	0.50					
Styrene	ND	0.50					
Tetrachloroethene	ND	0.50					
Tetrahydrofuran	ND	0.50					
Toluene	ND	0.50					
trans-1,2-Dichloroethene	ND	0.50					
trans-1,3-Dichloropropene	ND	0.50					
Trichloroethene	ND	0.20					
Trichlorofluoromethane	ND	0.50					
Vinyl acetate	ND	1.0					
Vinyl chloride	ND	0.50					
Surr: Bromofluorobenzene	*9.44*	0	*10*	0	*94.4*	*60-140*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: WSP USA
Work Order: 22080635
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB

QC BATCH REPORT

Batch ID: **R207725** Instrument ID: **VMS4** Method: **ETO-15**

LCS	Sample ID: **lcs-R207725**				Units: **ppbv**			Analysis Date: **8/30/2022 01:03 PM**		
Client ID:		Run ID: **VMS4_220830A**			SeqNo: **2834307**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	9.85	0.50	10	0	98.5	58.8-163	0			
1,1,2,2-Tetrachloroethane	9.49	0.50	10	0	94.9	60-140	0			
1,1,2-Trichloroethane	9.52	0.20	10	0	95.2	60-140	0			
1,1-Dichloroethane	9.32	0.50	10	0	93.2	60-140	0			
1,1-Dichloroethene	9.6	0.50	10	0	96	60-140	0			
1,2,4-Trichlorobenzene	8.22	0.50	10	0	82.2	49.3-150	0			
1,2,4-Trimethylbenzene	10.15	0.50	10	0	102	50.1-162	0			
1,2-Dibromoethane	9.83	0.20	10	0	98.3	60-140	0			
1,2-Dichlorobenzene	9.36	0.50	10	0	93.6	41.9-141	0			
1,2-Dichloroethane	10	0.20	10	0	100	60-140	0			
1,2-Dichloropropane	9.58	0.50	10	0	95.8	60-140	0			
1,3,5-Trimethylbenzene	9.72	0.50	10	0	97.2	60-140	0			
1,3-Butadiene	10.66	0.20	10	0	107	50.6-140	0			
1,3-Dichlorobenzene	9.19	0.50	10	0	91.9	60-140	0			
1,4-Dichlorobenzene	8.88	0.20	10	0	88.8	55.1-145	0			
1,4-Dioxane	8.54	1.0	10	0	85.4	60-140	0			
2-Butanone	9.56	1.0	10	0	95.6	60-140	0			
2-Hexanone	10.22	1.0	10	0	102	56.2-162	0			
2-Propanol	9.46	1.0	10	0	94.6	60-140	0			
4-Ethyltoluene	10.24	0.50	10	0	102	60-140	0			
4-Methyl-2-pentanone	10.19	1.0	10	0	102	60-140	0			
Acetone	8.36	1.0	10	0	83.6	60-140	0			
Benzene	9.44	0.50	10	0	94.4	60-140	0			
Benzyl chloride	9.38	1.0	10	0	93.8	31.9-174	0			
Bromodichloromethane	10.27	0.20	10	0	103	60-140	0			
Bromoform	11.02	0.50	10	0	110	60-140	0			
Bromomethane	11.16	0.50	10	0	112	60-140	0			
Carbon disulfide	9.38	0.50	10	0	93.8	60-140	0			
Carbon tetrachloride	10.42	0.50	10	0	104	60-140	0			
Chlorobenzene	9.61	0.50	10	0	96.1	60-140	0			
Chloroethane	9.49	0.50	10	0	94.9	60-140	0			
Chloroform	9.58	0.20	10	0	95.8	60-140	0			
Chloromethane	9.52	0.50	10	0	95.2	60-140	0			
cis-1,2-Dichloroethene	9.84	0.50	10	0	98.4	60-140	0			
cis-1,3-Dichloropropene	10.06	0.50	10	0	101	60-140	0			
Cumene	9.92	0.50	10	0	99.2	60-140	0			
Cyclohexane	9.62	0.50	10	0	96.2	60-140	0			
Dibromochloromethane	10.88	0.50	10	0	109	60-140	0			
Dichlorodifluoromethane	10.03	0.50	10	0	100	60-140	0			
Ethyl acetate	9.72	0.50	10	0	97.2	60-140	0			
Ethylbenzene	9.86	0.50	10	0	98.6	60-140	0			
Freon 113	9.53	0.50	10	0	95.3	60-140	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R207725** Instrument ID: **VMS4** Method: **ETO-15**

Freon 114	10.02	0.50	10	0	100	60-140	0
Heptane	9.69	0.50	10	0	96.9	60-140	0
Hexachlorobutadiene	9.31	0.20	10	0	93.1	60-140	0
Hexane	9.48	0.50	10	0	94.8	60-140	0
m,p-Xylene	19.88	0.50	20	0	99.4	60-140	0
Methylene chloride	8.98	2.0	10	0	89.8	60-140	0
MTBE	9.53	0.50	10	0	95.3	60.8-151	0
Naphthalene	6.94	0.20	10	0	69.4	53.1-152	0
o-Xylene	9.9	0.50	10	0	99	60-140	0
Propene	9.45	0.50	10	0	94.5	34.4-139	0
Styrene	9.65	0.50	10	0	96.5	60-140	0
Tetrachloroethene	9.95	0.50	10	0	99.5	60-140	0
Tetrahydrofuran	9.53	0.50	10	0	95.3	60-140	0
Toluene	9.8	0.50	10	0	98	60-140	0
trans-1,2-Dichloroethene	9.25	0.50	10	0	92.5	60-140	0
trans-1,3-Dichloropropene	10.35	0.50	10	0	104	60-140	0
Trichloroethene	9.89	0.20	10	0	98.9	60-140	0
Trichlorofluoromethane	9.74	0.50	10	0	97.4	60-140	0
Vinyl acetate	10.22	1.0	10	0	102	48.4-145	0
Vinyl chloride	11.56	0.50	10	0	116	60-140	0
Surr: Bromofluorobenzene	*10.06*	0	*10*	0	*101*	*60-140*	0

The following samples were analyzed in this batch: 22080635-01a 22080635-02a 22080635-03a

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: WSP USA
Work Order: 22080635
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB

QC BATCH REPORT

Batch ID: **R207800** Instrument ID: **VMS4** Method: **ETO-15**

MBLK	Sample ID: **mblk-R207800**				Units: **ppbv**		Analysis Date: **9/1/2022 01:29 PM**			
Client ID:		Run ID: **VMS4_220901A**			SeqNo: **2836759**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.20								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2,4-Trichlorobenzene	ND	0.50								
1,2,4-Trimethylbenzene	ND	0.50								
1,2-Dibromoethane	ND	0.20								
1,2-Dichlorobenzene	ND	0.50								
1,2-Dichloroethane	ND	0.20								
1,2-Dichloropropane	ND	0.50								
1,3,5-Trimethylbenzene	ND	0.50								
1,3-Butadiene	ND	0.20								
1,3-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.20								
1,4-Dioxane	ND	1.0								
2-Butanone	ND	1.0								
2-Hexanone	ND	1.0								
2-Propanol	ND	1.0								
4-Ethyltoluene	ND	0.50								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	1.0								
Benzene	ND	0.50								
Benzyl chloride	ND	1.0								
Bromodichloromethane	ND	0.20								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.20								
Chloromethane	ND	0.50								
cis-1,2-Dichloroethene	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
Cumene	ND	0.50								
Cyclohexane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
Ethyl acetate	ND	0.50								
Ethylbenzene	ND	0.50								
Freon 113	ND	0.50								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R207800** Instrument ID: **VMS4** Method: **ETO-15**

Freon 114	ND	0.50					
Heptane	ND	0.50					
Hexachlorobutadiene	ND	0.20					
Hexane	ND	0.50					
m,p-Xylene	ND	0.50					
Methylene chloride	ND	2.0					
MTBE	ND	0.50					
Naphthalene	ND	0.20					
o-Xylene	ND	0.50					
Propene	ND	0.50					
Styrene	ND	0.50					
Tetrachloroethene	ND	0.50					
Tetrahydrofuran	ND	0.50					
Toluene	ND	0.50					
trans-1,2-Dichloroethene	ND	0.50					
trans-1,3-Dichloropropene	ND	0.50					
Trichloroethene	ND	0.20					
Trichlorofluoromethane	ND	0.50					
Vinyl acetate	ND	1.0					
Vinyl chloride	ND	0.50					
Surr: Bromofluorobenzene	*9.45*	0	*10*	0	*94.5*	*60-140*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: WSP USA
Work Order: 22080635
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB

QC BATCH REPORT

Batch ID: **R207800** Instrument ID: **VMS4** Method: **ETO-15**

LCS	Sample ID: **lcs-R207800**				Units: **ppbv**			Analysis Date: **9/1/2022 12:41 PM**		
Client ID:		Run ID: **VMS4_220901A**			SeqNo: **2836758**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	10.01	0.50	10	0	100	58.8-163	0			
1,1,2,2-Tetrachloroethane	9.05	0.50	10	0	90.5	60-140	0			
1,1,2-Trichloroethane	8.9	0.20	10	0	89	60-140	0			
1,1-Dichloroethane	10.4	0.50	10	0	104	60-140	0			
1,1-Dichloroethene	10.55	0.50	10	0	106	60-140	0			
1,2,4-Trichlorobenzene	7.34	0.50	10	0	73.4	49.3-150	0			
1,2,4-Trimethylbenzene	10.25	0.50	10	0	102	50.1-162	0			
1,2-Dibromoethane	9.25	0.20	10	0	92.5	60-140	0			
1,2-Dichlorobenzene	9.23	0.50	10	0	92.3	41.9-141	0			
1,2-Dichloroethane	11.06	0.20	10	0	111	60-140	0			
1,2-Dichloropropane	10.34	0.50	10	0	103	60-140	0			
1,3,5-Trimethylbenzene	10.02	0.50	10	0	100	60-140	0			
1,3-Butadiene	1.97	0.20	10	0	19.7	50.6-140	0			S
1,3-Dichlorobenzene	9.09	0.50	10	0	90.9	60-140	0			
1,4-Dichlorobenzene	8.61	0.20	10	0	86.1	55.1-145	0			
1,4-Dioxane	9.68	1.0	10	0	96.8	60-140	0			
2-Butanone	9.07	1.0	10	0	90.7	60-140	0			
2-Hexanone	7.41	1.0	10	0	74.1	56.2-162	0			
2-Propanol	8.28	1.0	10	0	82.8	60-140	0			
4-Ethyltoluene	10.19	0.50	10	0	102	60-140	0			
4-Methyl-2-pentanone	7.85	1.0	10	0	78.5	60-140	0			
Acetone	6.8	1.0	10	0	68	60-140	0			
Benzene	8.93	0.50	10	0	89.3	60-140	0			
Benzyl chloride	9.07	1.0	10	0	90.7	31.9-174	0			
Bromodichloromethane	9.88	0.20	10	0	98.8	60-140	0			
Bromoform	10.86	0.50	10	0	109	60-140	0			
Bromomethane	10.65	0.50	10	0	106	60-140	0			
Carbon disulfide	8.69	0.50	10	0	86.9	60-140	0			
Carbon tetrachloride	10.61	0.50	10	0	106	60-140	0			
Chlorobenzene	9.76	0.50	10	0	97.6	60-140	0			
Chloroethane	9.96	0.50	10	0	99.6	60-140	0			
Chloroform	9.39	0.20	10	0	93.9	60-140	0			
Chloromethane	7.95	0.50	10	0	79.5	60-140	0			
cis-1,2-Dichloroethene	11.27	0.50	10	0	113	60-140	0			
cis-1,3-Dichloropropene	9.33	0.50	10	0	93.3	60-140	0			
Cumene	10.08	0.50	10	0	101	60-140	0			
Cyclohexane	9.22	0.50	10	0	92.2	60-140	0			
Dibromochloromethane	10.43	0.50	10	0	104	60-140	0			
Dichlorodifluoromethane	8.38	0.50	10	0	83.8	60-140	0			
Ethyl acetate	9.16	0.50	10	0	91.6	60-140	0			
Ethylbenzene	10.04	0.50	10	0	100	60-140	0			
Freon 113	9.25	0.50	10	0	92.5	60-140	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: WSP USA
Work Order: 22080635
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB

QC BATCH REPORT

Batch ID: **R207800** Instrument ID: **VMS4** Method: **ETO-15**

Freon 114	8.3	0.50	10	0	83	60-140	0
Heptane	8.3	0.50	10	0	83	60-140	0
Hexachlorobutadiene	8.07	0.20	10	0	80.7	60-140	0
Hexane	11.62	0.50	10	0	116	60-140	0
m,p-Xylene	20.19	0.50	20	0	101	60-140	0
Methylene chloride	8.51	2.0	10	0	85.1	60-140	0
MTBE	9.42	0.50	10	0	94.2	60.8-151	0
Naphthalene	6.44	0.20	10	0	64.4	53.1-152	0
o-Xylene	10.05	0.50	10	0	100	60-140	0
Propene	5.22	0.50	10	0	52.2	34.4-139	0
Styrene	9.86	0.50	10	0	98.6	60-140	0
Tetrachloroethene	9.2	0.50	10	0	92	60-140	0
Tetrahydrofuran	7.64	0.50	10	0	76.4	60-140	0
Toluene	9.32	0.50	10	0	93.2	60-140	0
trans-1,2-Dichloroethene	8.99	0.50	10	0	89.9	60-140	0
trans-1,3-Dichloropropene	9.21	0.50	10	0	92.1	60-140	0
Trichloroethene	9.52	0.20	10	0	95.2	60-140	0
Trichlorofluoromethane	9.92	0.50	10	0	99.2	60-140	0
Vinyl acetate	7.96	1.0	10	0	79.6	48.4-145	0
Vinyl chloride	7.14	0.50	10	0	71.4	60-140	0
Surr: Bromofluorobenzene	*9.89*	0	*10*	0	*98.9*	*60-140*	0

The following samples were analyzed in this batch:

22080635-01a	22080635-02a	22080635-03a
22080635-04a		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: WSP USA
Work Order: 22080635
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB

QC BATCH REPORT

Batch ID: **R207813** Instrument ID: **VMS4** Method: **ETO-15**

MBLK	Sample ID: **mblk-R207813**				Units: **ppbv**		Analysis Date: **9/2/2022 05:03 PM**			
Client ID:		Run ID: **VMS4_220902A**			SeqNo: **2837038**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	0.50								
1,1,2,2-Tetrachloroethane	ND	0.50								
1,1,2-Trichloroethane	ND	0.20								
1,1-Dichloroethane	ND	0.50								
1,1-Dichloroethene	ND	0.50								
1,2,4-Trichlorobenzene	ND	0.50								
1,2,4-Trimethylbenzene	ND	0.50								
1,2-Dibromoethane	ND	0.20								
1,2-Dichlorobenzene	ND	0.50								
1,2-Dichloroethane	ND	0.20								
1,2-Dichloropropane	ND	0.50								
1,3,5-Trimethylbenzene	ND	0.50								
1,3-Butadiene	ND	0.20								
1,3-Dichlorobenzene	ND	0.50								
1,4-Dichlorobenzene	ND	0.20								
1,4-Dioxane	ND	1.0								
2-Butanone	ND	1.0								
2-Hexanone	ND	1.0								
2-Propanol	ND	1.0								
4-Ethyltoluene	ND	0.50								
4-Methyl-2-pentanone	ND	1.0								
Acetone	ND	1.0								
Benzene	ND	0.50								
Benzyl chloride	ND	1.0								
Bromodichloromethane	ND	0.20								
Bromoform	ND	0.50								
Bromomethane	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.50								
Chlorobenzene	ND	0.50								
Chloroethane	ND	0.50								
Chloroform	ND	0.20								
Chloromethane	ND	0.50								
cis-1,2-Dichloroethene	ND	0.50								
cis-1,3-Dichloropropene	ND	0.50								
Cumene	ND	0.50								
Cyclohexane	ND	0.50								
Dibromochloromethane	ND	0.50								
Dichlorodifluoromethane	ND	0.50								
Ethyl acetate	ND	0.50								
Ethylbenzene	ND	0.50								
Freon 113	ND	0.50								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R207813** Instrument ID: **VMS4** Method: **ETO-15**

Freon 114	ND	0.50					
Heptane	ND	0.50					
Hexachlorobutadiene	ND	0.20					
Hexane	ND	0.50					
m,p-Xylene	ND	0.50					
Methylene chloride	ND	2.0					
MTBE	ND	0.50					
Naphthalene	ND	0.20					
o-Xylene	ND	0.50					
Propene	ND	0.50					
Styrene	ND	0.50					
Tetrachloroethene	ND	0.50					
Tetrahydrofuran	ND	0.50					
Toluene	ND	0.50					
trans-1,2-Dichloroethene	ND	0.50					
trans-1,3-Dichloropropene	ND	0.50					
Trichloroethene	ND	0.20					
Trichlorofluoromethane	ND	0.50					
Vinyl acetate	ND	1.0					
Vinyl chloride	ND	0.50					
Surr: Bromofluorobenzene	*9.49*	0	*10*	0	*94.9*	*60-140*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: WSP USA
Work Order: 22080635
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB

QC BATCH REPORT

Batch ID: **R207813** Instrument ID: **VMS4** Method: **ETO-15**

LCS	Sample ID: **lcs-R207813**				Units: **ppbv**			Analysis Date: **9/2/2022 04:17 PM**		
Client ID:		Run ID: **VMS4_220902A**			SeqNo: **2837037**		Prep Date:		DF: **1**	

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	11.75	0.50	10	0	118	58.8-163	0			
1,1,2,2-Tetrachloroethane	10.54	0.50	10	0	105	60-140	0			
1,1,2-Trichloroethane	9.51	0.20	10	0	95.1	60-140	0			
1,1-Dichloroethane	10.05	0.50	10	0	100	60-140	0			
1,1-Dichloroethene	10.3	0.50	10	0	103	60-140	0			
1,2,4-Trichlorobenzene	10.18	0.50	10	0	102	49.3-150	0			
1,2,4-Trimethylbenzene	11.94	0.50	10	0	119	50.1-162	0			
1,2-Dibromoethane	9.89	0.20	10	0	98.9	60-140	0			
1,2-Dichlorobenzene	10.57	0.50	10	0	106	41.9-141	0			
1,2-Dichloroethane	12.11	0.20	10	0	121	60-140	0			
1,2-Dichloropropane	9.52	0.50	10	0	95.2	60-140	0			
1,3,5-Trimethylbenzene	11.55	0.50	10	0	116	60-140	0			
1,3-Butadiene	6.75	0.20	10	0	67.5	50.6-140	0			
1,3-Dichlorobenzene	10.41	0.50	10	0	104	60-140	0			
1,4-Dichlorobenzene	10.34	0.20	10	0	103	55.1-145	0			
1,4-Dioxane	9.9	1.0	10	0	99	60-140	0			
2-Butanone	9.61	1.0	10	0	96.1	60-140	0			
2-Hexanone	9.07	1.0	10	0	90.7	56.2-162	0			
2-Propanol	8.95	1.0	10	0	89.5	60-140	0			
4-Ethyltoluene	11.63	0.50	10	0	116	60-140	0			
4-Methyl-2-pentanone	9.06	1.0	10	0	90.6	60-140	0			
Acetone	8.03	1.0	10	0	80.3	60-140	0			
Benzene	9.68	0.50	10	0	96.8	60-140	0			
Benzyl chloride	12.55	1.0	10	0	126	31.9-174	0			
Bromodichloromethane	11.56	0.20	10	0	116	60-140	0			
Bromoform	14.17	0.50	10	0	142	60-140	0			S
Bromomethane	14.66	0.50	10	0	147	60-140	0			S
Carbon disulfide	9.32	0.50	10	0	93.2	60-140	0			
Carbon tetrachloride	12.36	0.50	10	0	124	60-140	0			
Chlorobenzene	10.48	0.50	10	0	105	60-140	0			
Chloroethane	9.33	0.50	10	0	93.3	60-140	0			
Chloroform	10.87	0.20	10	0	109	60-140	0			
Chloromethane	8.26	0.50	10	0	82.6	60-140	0			
cis-1,2-Dichloroethene	10.53	0.50	10	0	105	60-140	0			
cis-1,3-Dichloropropene	10.72	0.50	10	0	107	60-140	0			
Cumene	10.62	0.50	10	0	106	60-140	0			
Cyclohexane	9.93	0.50	10	0	99.3	60-140	0			
Dibromochloromethane	11.55	0.50	10	0	116	60-140	0			
Dichlorodifluoromethane	10.35	0.50	10	0	104	60-140	0			
Ethyl acetate	10.34	0.50	10	0	103	60-140	0			
Ethylbenzene	11.44	0.50	10	0	114	60-140	0			
Freon 113	9.84	0.50	10	0	98.4	60-140	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R207813** Instrument ID: **VMS4** Method: **ETO-15**

Freon 114	9.6	0.50	10	0	96	60-140	0
Heptane	9.15	0.50	10	0	91.5	60-140	0
Hexachlorobutadiene	9.76	0.20	10	0	97.6	60-140	0
Hexane	9.7	0.50	10	0	97	60-140	0
m,p-Xylene	23.45	0.50	20	0	117	60-140	0
Methylene chloride	8.68	2.0	10	0	86.8	60-140	0
MTBE	10.78	0.50	10	0	108	60.8-151	0
Naphthalene	9.71	0.20	10	0	97.1	53.1-152	0
o-Xylene	11.58	0.50	10	0	116	60-140	0
Propene	7.65	0.50	10	0	76.5	34.4-139	0
Styrene	11.14	0.50	10	0	111	60-140	0
Tetrachloroethene	9.89	0.50	10	0	98.9	60-140	0
Tetrahydrofuran	8.56	0.50	10	0	85.6	60-140	0
Toluene	9.95	0.50	10	0	99.5	60-140	0
trans-1,2-Dichloroethene	9.25	0.50	10	0	92.5	60-140	0
trans-1,3-Dichloropropene	11.14	0.50	10	0	111	60-140	0
Trichloroethene	10.21	0.20	10	0	102	60-140	0
Trichlorofluoromethane	11.59	0.50	10	0	116	60-140	0
Vinyl acetate	8.69	1.0	10	0	86.9	48.4-145	0
Vinyl chloride	11.62	0.50	10	0	116	60-140	0
Surr: Bromofluorobenzene	*10.38*	0	*10*	0	*104*	*60-140*	0

The following samples were analyzed in this batch:

22080635-01a	22080635-02a	22080635-03a
22080635-04a		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 07-Sep-22

Client: WSP USA
Project: ENB Line 13 MP 312; 31401967.705B-03.SUB
WorkOrder: **22080635**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

Acronym	Description
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SDL	Sample Detection Limit
SW	SW-846 Method

Units Reported	Description
µg/m3	
ppbv	

ALS Environmental

Sample Receipt Checklist

Client Name: **WSP-KALAMAZOO** Date/Time Received: **16-Aug-22 15:04**

Work Order: **22080635** Received by: **AB**

Checklist completed by: Alec Bolender (eSignature) 16-Aug-22 (Date) Reviewed by: Rob Nieman (eSignature) 22-Aug-22 (Date)

Matrices: air

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☐	No ☑	
Temperature(s)/Thermometer(s):			
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:			
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

Air Canister - Chain of Custody Record / Analytical Service Request

Page 1 of 1

22080635

5096

Ship To: ALS | Environmental
4388 Glendale Milford Rd.
Cincinnati, Ohio 45242
Phone: (513) 733-5336
Fax: (513) 733-5347

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) (0 Day-Standard)

ALS Project No.

OH VAP: ○ Yes ⊗ No
OH BUSTR: ○ Yes ⊗ No

Company Name & Address (Reporting Information)	Project Name	Project Manager	Phone	Fax	P.O. # / Billing Information	Email Address for Result Reporting	Sampler (Print & Sign)
WSP USA, Inc 27200 HAGGERTY RD, SUITE B-12 FARMINGTON HILLS, MI 48331	ENB LINE 13 MP 312 Project Number: 31401967.785B - 03.SUB	Tim Huff	314-206-4212		EMAIL INVOICE TO: USENVAccountsPayable@wsp.com	tim.huff@wsp.com; eric.wesselbyke@wsp.com	ERIC WESSELBYKE

Analysis Method

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID	Flow Controller ID	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	PID	TO15 VOCs	Type: SS = SubSlab, IA = Indoor Air, SG = Soil Gas, O = Other, AA = Ambient Air, SVE = Soil Vapor Extract	Comments / Specific Instructions (ie: water or pressure issues)
SVE-1	1	8/10/22	12:38	120008	119700	-30	-5.5	294.5ppm	X	SVE	
SVE-2	2	8/10/22	~~11:36~~ 23:36	119250	119849	-30	-6	438.8ppm	X	SVE	
SVE-3	3	8/11/22	09:35	120004	119851	-30	-6.5	406.7	X	SVE	
SVE-4	4	8/11/22	09:45	120006	119850	-30	-5	392.2	X	SVE	

DELIVERY METHOD:
STD / PRTY MAIL UPS
CLIENT DROP BOX
FEDEX ALS COURIER
OTHER: _____

COOLING METHOD: NONE
COOLER WET ICE ICE PACK
CUSTODY SEALS: NONE
COOLER PACKAGE SAMPLES
COOLER TEMP: n/a °C

There will be additional charges for damaged equipment

Report QC Levels II
EDD required (Yes) / No
Type: _____ Units: _____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
[signature]	8/15/22	1145	FEDEX	8/15/22	1145
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
			[signature]	8/16/22	1504

Cooler / Blank Temperature ____ °C