

February 26, 2018

Gavora, Inc.
246 Illinois Street, #3B
Fairbanks, AK 99707

Attn: Mr. Rudy Gavora

**RE: JANUARY 2018 INDOOR-AIR AND CRAWLSPACE-AIR SAMPLING
SUMMARY REPORT, SHOPPER'S FORUM MALL, ADEC FILE NO. 102.38.100**

Shannon & Wilson is pleased to present this summary report for indoor- and crawlspace-air monitoring at the Shopper's Forum Mall Annex (Annex), located at 1255 Airport Way in Fairbanks, Alaska. The objective of our work was to monitor concentrations of tetrachloroethene (PCE), trichloroethene (TCE), and their related compounds (1,1-dichloroethene; *cis*-1,2-dichloroethene; and *trans*-1,2-dichloroethene) in crawlspace and indoor-air at the Annex. This report documents the results of the second of four planned, consecutive quarterly air-quality monitoring events. Our scope of services for this project included:

- collecting indoor- and crawlspace-air samples at select locations within the Annex; and
- preparing this summary report documenting sampling activities and analytical results.

We performed these sampling activities following our July 2013 *Site Characterization and Vapor-Intrusion Monitoring Work Plan*; which was reviewed and approved by the Alaska Department of Environmental Conservation (ADEC).

SAMPLING AND OBSERVATIONS

On January 23 and 24, 2018, Kristen Freiburger and Cacy Wilfer from Shannon & Wilson's Fairbanks office performed the sampling described herein. We deployed the Radiello® 130 passive samplers in the breathing space (head height) in discrete but representative locations within each unit and crawlspace. The samplers remained in place for approximately 24 hours. The passive samplers consist of an outer cylindrical diffusive surface (porous polypropylene) surrounding an interior adsorbing surface. Air constituents small enough to pass through the pore space of the exterior surface are adsorbed onto the interior surface allowing for a sample to be analyzed.

We collected three indoor-air samples from Miguel's restaurant lease spaces (Figure 1), one indoor-air sample from Bamboo Panda (Figure 2), and one indoor-air sample from Fairbanks Fast Foto (Figure 3). We also collected air samples from two crawlspace locations; one from Bamboo Panda and the other from Fairbanks Fast Foto.

We collected indoor-air project sample *Miguel's-Kitchen* from the pantry in Miguel's kitchen, *Miguel's-Office* from Miguel's main office, *Miguel's-Banquet Room* from the banquet space adjacent to the main dining area in Miguel's, *Bamboo Panda-Kitchen* from the kitchen at Bamboo Panda, and *Fast Foto-Office* from the office of Fairbanks Fast Foto. We collected crawlspace-air project sample *Crawlspace-BP* from the crawlspace beneath Bamboo Panda, and then a crawlspace-air field-duplicate pair both named *Crawlspace-FF* from the crawlspace beneath Fairbanks Fast Foto.

At the end of deployment, we retrieved the passive samplers and shipped them to Eurofins Air Toxins, Ltd. (Eurofins) testing laboratory in Folsom, California. We submitted the samplers for analysis of PCE, TCE, 1,1-dichloroethene, cis-1,2-dichloroethene, and trans-1,2-dichloroethene by the laboratory's custom gas chromatography mass spectrometry (GC/MS) modified method EPA TO-17. TCE and PCE were determined quantitatively, but concentrations of the other analytes were estimated.

We have enclosed copies of our sampling forms for this project with this report.

RESULTS

We present the analytical results of the indoor-air and crawlspace samples in Table 1, which is enclosed with this report.

PCE was detected in each project sample at concentrations below the ADEC target levels (Table 1). The remaining analytes were not detected above their respective reporting limits. The ADEC target levels were obtained from the November 2017 ADEC Vapor Intrusion Guidance for Contaminated Sites. Indoor-air samples were compared to the commercial values listed in Appendix D and crawlspace samples were compared to commercial values listed in Appendix E.

QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance (QA) and quality control (QC) activities for this project were designed to achieve data quality and reliability. We reviewed the analytical results for laboratory QC

samples, and conducted our own QA assessment for this project. Our QA-review procedures allow us to document the accuracy and precision of the analytical data, and check that the analyses are sufficiently sensitive to detect analytes at levels below regulatory standards.

For this report, we reviewed the indoor-air and sub-slab soil-gas data reported by Eurofins Work Order (WO) 1801415. The laboratory report contained a case narrative, document sample receipt, and analytical results. Details regarding the results of our QA analysis are presented in the ADEC data-review checklist, enclosed with this report, along with a copy of the laboratory report.

Sample Handling and Holding Times

We reviewed the laboratory narrative provided by the laboratory. The samples were noted to have been received in good condition upon receipt at the Eurofins laboratory.

Analytical Sensitivity

Consistent with our previous air-sampling reports, we compared indoor-air sample reporting limits to target levels for commercial indoor-air listed in ADEC's Vapor Intrusion Guidance, Appendix D. We compared crawlspace sample reporting limits to target levels for commercial sub-slab soil-gas listed in ADEC's Vapor Intrusion Guidance, Appendix E. Reporting limits were below commercial target levels for each analyte.

Accuracy

The laboratory assessed the accuracy of their analytical procedures by analyzing laboratory control samples (LCS) and LCS duplicates (LCSDs). LCS/LCSD analysis allows the laboratory to evaluate their ability to recover analytes added to clean aqueous matrices. LCS/LCSD samples were reported for each analyte in the laboratory report. Accuracy is also assessed for organic analyses by evaluating the recovery of a surrogate added to each project sample. The LCS/LCSD, and surrogate recovery data for each sample were within laboratory control limits and the results are considered accurate.

Precision

To evaluate data precision and reproducibility of our sampling techniques, we calculated the relative percent difference (RPD) of duplicate results. RPD is defined as the difference between the sample and its field duplicate divided by the mean of the two. We can only evaluate RPDs if

the result of the analysis for both the sample and its duplicate are greater than the reporting limit for a given analyte.

We collected a field-duplicate pair from the crawlspace beneath Fairbanks Fast Foto; both samples were named *Crawlspace-FF*. The RPDs were within QC criteria for the field-duplicate pair, where calculable.

Data Quality Summary

By working in accordance with our proposed scope of services, we consider the indoor-air and sub-slab soil-gas samples we collected to be representative of the site conditions at the locations and times they were collected. Based on our QA review, no sample results were rejected as unusable due to QC failures. For this project, the quality of the analytical data is acceptable for its intended use.

CONCLUSIONS AND RECOMMENDATIONS

Based on our observations and analytical-sample results, Shannon & Wilson presents the following conclusions and recommendations.

PCE was detected in each of the project samples at concentrations below its indoor-air or subslab soil-gas (crawlspace-air) target levels. Other analytes were not detected above their respective reporting limits.

Our January 2018 sample results are similar to results from our previous indoor-air sampling completed in October 2017. Refer to Table 2 for a summary of historical results.

We recommend Gavora continue monitoring Annex air quality to comply with ADEC's request for one year's worth of quarterly indoor- and crawlspace-air quality sampling.

CLOSURE

This report was prepared for the exclusive use of Gavora, Inc., and their representatives. We understand this report will be used to monitor indoor-air and sub-slab soil-gas at the Annex. This report should not be used for other purposes without Shannon & Wilson's review. We have prepared the document "Important Information about Your Geotechnical/Environmental Report" to help you and others understand the use and limitations of this report.

Our observations represent site conditions as they existed during our sampling activities on January 23 and 24, 2018. Our observations are specific to the locations and times noted herein, and may not be applicable to all areas of the site. No number of indoor-air and sub-slab soil-gas samples along with analytical testing can precisely predict the characteristics, quality, or distribution of site conditions. Potential variations include, but are not limited to:

- The conditions between sampling points may be different.
- The passage of time or intervening causes (natural and manmade) may result in changes to site conditions.
- Contaminant concentrations may change in response to natural conditions, chemical reactions, and/or other events.
- The presence, distribution, and concentration of contaminants may vary from our sampling locations. Our tests may not represent the highest contaminant concentrations at the site.

The report should not be used without our approval if any of the following occurs:

- Conditions change due to natural forces or human activity under, at, or adjacent to the site.
- Project details change or new information becomes available such that our analyses, conclusion, and recommendations may be affected.
- If the site ownership or land use has changed.
- More than ten years has passed since the date of this summary letter report.
- Regulations, laws, or cleanup levels change.
- If the site's regulatory status has changed.

If any of these occur, we should be retained to review the applicability or our analyses, conclusions, and recommendations.

State and/or federal agencies may require reporting of the information included in this report. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore has not, and will not, disclose the results of this study unless specifically requested and authorized by Gavora, Inc., or as required by law. Regulatory agencies may reach different conclusions than Shannon & Wilson.

Gavora, Inc.
Mr. Rudy Gavora
February 26, 2018
Page 6 of 6

SHANNON & WILSON, INC.

We are pleased to have had the opportunity to assist you with this project. Please contact me if you have any questions.

Sincerely,

SHANNON & WILSON, INC.

Kristen Freiburger
Senior Chemist

Enc: Table 1 – January 2018 Indoor- and Crawlspace-Air Analytical Summary
Table 2 – Historical Air-Sample Results – Crawlspace and Indoor Air
Figure 1 – Sample Locations, Miguel's
Figure 2 – Sample Locations, Bamboo Panda
Figure 3 – Sample Locations, Fast Foto
Eurofins Air Toxics, Inc. Laboratory Report of Analysis (WO 1801415)
Laboratory Data Review Checklist for Air Samples
Field-Sampling Forms for January 23 and 24, 2018 Sampling Event
Important Information about Your Geotechnical/Environmental Report

TABLE 1
JANUARY 2018 INDOOR- AND CRAWLSPACE-AIR ANALYTICAL SUMMARY
SHOPPER'S FORUM MALL ANNEX

Analyte		Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene
Abbreviation		PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE
ADEC Target Levels†		41	2.2	79	NA	790
<i>Bamboo Panda-Kitchen</i>	µg/m ³	9.6	<1.0	<3.7 C	<2.2 C	<2.3 C
<i>Fast Foto-Office</i>	µg/m ³	8.4	<1.0	<3.7 C	<2.2 C	<2.3 C
<i>Miguel's-Banquet Room</i>	µg/m ³	13	<1.0	<3.6 C	<2.2 C	<2.3 C
<i>Miguel's-Kitchen</i>	µg/m ³	14	<0.99	<3.6 C	<2.2 C	<2.3 C
<i>Miguel's-Office</i>	µg/m ³	13	<1.0	<3.6 C	<2.2 C	<2.3 C
ADEC Target Levels†		1,800	84	8,800	NA	NA
<i>Crawlspace-BP</i>	µg/m ³	34	<1.0	<3.8 C	<2.3 C	<2.4 C
<i>Crawlspace-FF</i>	µg/m ³	21	<1.0	<3.8 C	<2.3 C	<2.4 C
<i>Crawlspace-FF_DUP</i>	µg/m ³	20	<1.0	<3.7 C	<2.3 C	<2.4 C

Notes: Sample *Crawlspace-FF_DUP* is a field-duplicate of sample *Crawlspace-FF*.

ADEC Alaska Department of Environmental Conservation

† The ADEC Target Levels were obtained from the November 2017 ADEC Vapor Intrusion Guidance for Contaminated Sites - Appendix D: Target Levels for Indoor Air - Commercial and Appendix E: Target Levels for Subslab Soil Gas - Commercial.

NA Not applicable; ADEC Target Level not established.

µg/m³ microgram per cubic meter

< Analyte not detected; listed as less than the reporting limit (RL).

C Estimated concentration due to estimated uptake rates. Flag applied by the laboratory.

**TABLE 2
HISTORICAL AIR-SAMPLE RESULTS
CRAWLSPACE AND INDOOR AIR, SHOPPER'S FORM MALL ANNEX**

Sampling Location	Date	PCE	TCE	Active Air Quality Mitigation Systems				
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	Portable GAC	In-Line GAC	HRV	SSDPS	
Miguel's - Kitchen (indoor air)	April 2011	250E	1.6					
	February 2012	280J	1.7J					
	April 2013	260	1.8		x	x		
	August 2013	1,200	7.6		x	x		
	Sub-slab depressurization system startup, October 2013							
	October 2013	43	<1.0		x	x	x	
	November 2013	29	<1.0			x	x	
	February 2014	27	<1.0	x		x	x	
	February 2017	32	<0.1			x	x	
	October 2017	12	<0.96			x	x	
January 2018	14	<0.99			x	x		
Miguel's - Office (indoor air)	February 2012	940	4.6					
	April 2013*	470	2.7	x	x	x		
	August 2013*	4,800	25	x	x	x		
	Sub-slab depressurization system startup, October 2013							
	October 2013	67	<1.0	x	x	x	x	
	November 2013*	47	<1.0	x		x	x	
	February 2014*	34JL	<1.0JL	x		x	x	
	February 2017	27	<1.0			x	x	
	October 2017	14	<0.95			x	x	
January 2018	13	<1.0			x	x		
Miguel's - Banquet Room	April 2011	1,600 ^a	7.3			x		
	Sub-slab depressurization system startup, October 2013							
	November 2013	45	<1.0			x	x	
	February 2014	25	<1.0	x		x	x	
	February 2017	28	<1.0			x	x	
October 2017	14	<0.95			x	x		

**TABLE 2
HISTORICAL AIR-SAMPLE RESULTS
CRAWLSPACE AND INDOOR AIR, SHOPPER'S FORM MALL ANNEX**

Sampling Location	Date	PCE	TCE	Active Air Quality Mitigation Systems				
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	Portable GAC	In-Line GAC	HRV	SSDPS	
	January 2018	13	<1.0			x	x	
Bamboo Panda - Crawlspace	April 2011	2,000	9.8					
	February 2012	3,600	20					
	Crawlspace ventilation startup, October 2012							
	April 2013	1,400	7.1		x	x		
	August 2013	190	<0.94		x	x		
	November 2013	180	<1.0			x	x	
	February 2014	73	<1.0	x		x	x	
	February 2017	75	<1.0			x	x	
	October 2017	98	<0.96			x	x	
	January 2018	34	<1.0			x	x	
Bamboo Panda - Indoor Air	February 2012	730J	3.6J					
	Crawlspace ventilation startup, October 2012							
	April 2013	210	1.4		x	x		
	August 2013	5.3	<0.93		x	x		
	November 2013	27	<1.0			x	x	
	February 2014	12	<1.0	x		x	x	
	February 2017	18	<1.0			x	x	
	October 2017	14	<0.98			x	x	
January 2018	9.6	<1.0			x	x		
Fairbanks Fast Foto - Crawlspace	April 2013	620	3.1		x	x		
	August 2013	120	<0.94		x	x		
	November 2013	90	<1.0			x	x	
	February 2014	42	<1.0	x		x	x	
	February 2017	14	<1.0			x	x	
	October 2017	27	<0.98			x	x	
	January 2018	21	<1.0			x	x	

TABLE 2
HISTORICAL AIR-SAMPLE RESULTS
CRAWLSPACE AND INDOOR AIR, SHOPPER'S FORM MALL ANNEX

Sampling Location	Date	PCE	TCE	Active Air Quality Mitigation Systems			
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	Portable GAC	In-Line GAC	HRV	SSDPS
Fairbanks Fast Foto - Indoor Air	February 2012	25	0.41				
	Crawlspace ventilation startup, October 2012						
	April 2013	260	1.6		x	x	
	August 2013	46	<0.93		x	x	
	November 2013	47	<1.0			x	x
	February 2014	26	<1.0	x		x	x
	February 2017	1.8	<1.0			x	x
	October 2017	2.9	<0.96			x	x
January 2018	8.4	<1.0			x	x	
ADEC Exterior or Subslab Soil Gas Target Level †		1,800	84				
ADEC Indoor-Air Target Level †		41	2.2				

ADEC Alaska Department of Environmental Conservation

† The ADEC Target Levels were obtained from the November 2017 ADEC Vapor Intrusion Guidance for Contaminated Sites - Appendix D: Target Levels for Indoor Air - Commercial and Appendix E: Target Levels for Subslab Soil Gas - Commercial.

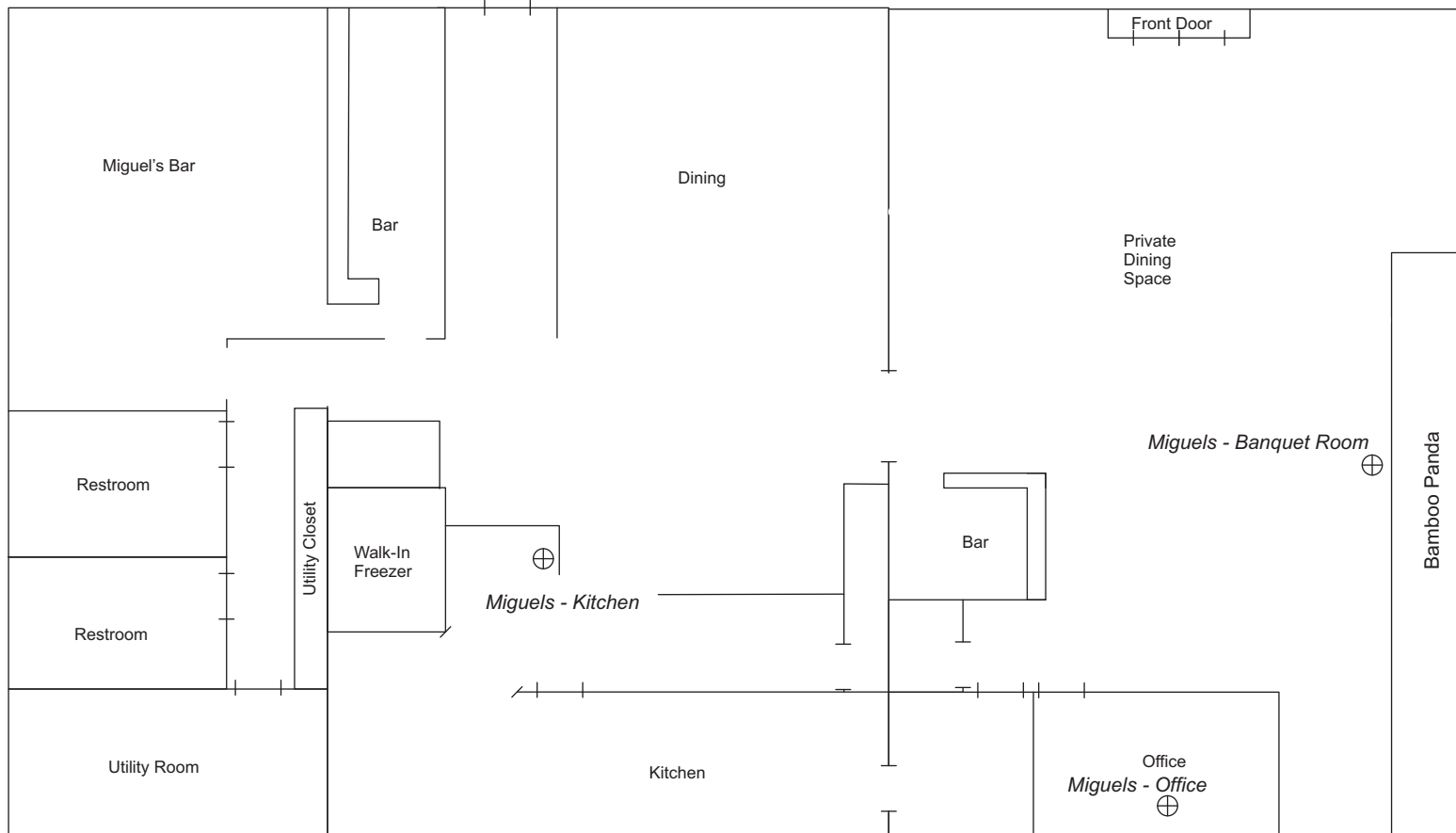
$\mu\text{g}/\text{m}^3$ microgram per cubic meter

< Analyte not detected; listed as less than the reporting limit (RL).

Bold Detected concentration exceeds current regulatory limit.

JL Estimated result, biased low, due to quality control failures. Flag applied by Shannon & Wilson, Inc.

J Estimated result due to quality control failures, or a detected result below the reporting limit.




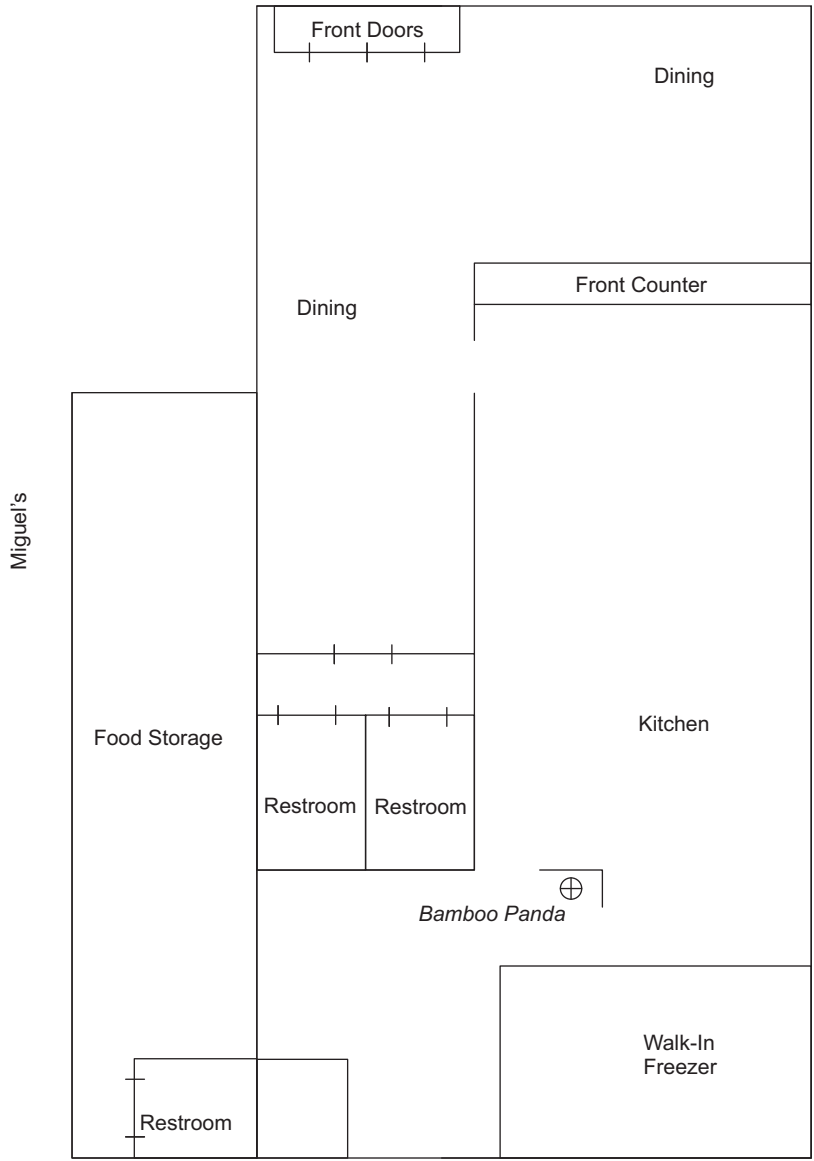
Not to Scale

Legend

⊕ Approximate indoor-air sampling location



Shopper's Forum Annex Fairbanks, Alaska	
SAMPLE LOCATIONS, MIGUEL'S	
February 2018	31-1-11850-001
 SHANNON & WILSON, INC. <small>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS</small>	Figure 1



Miguel's


Fairbanks Fast Foto

Legend

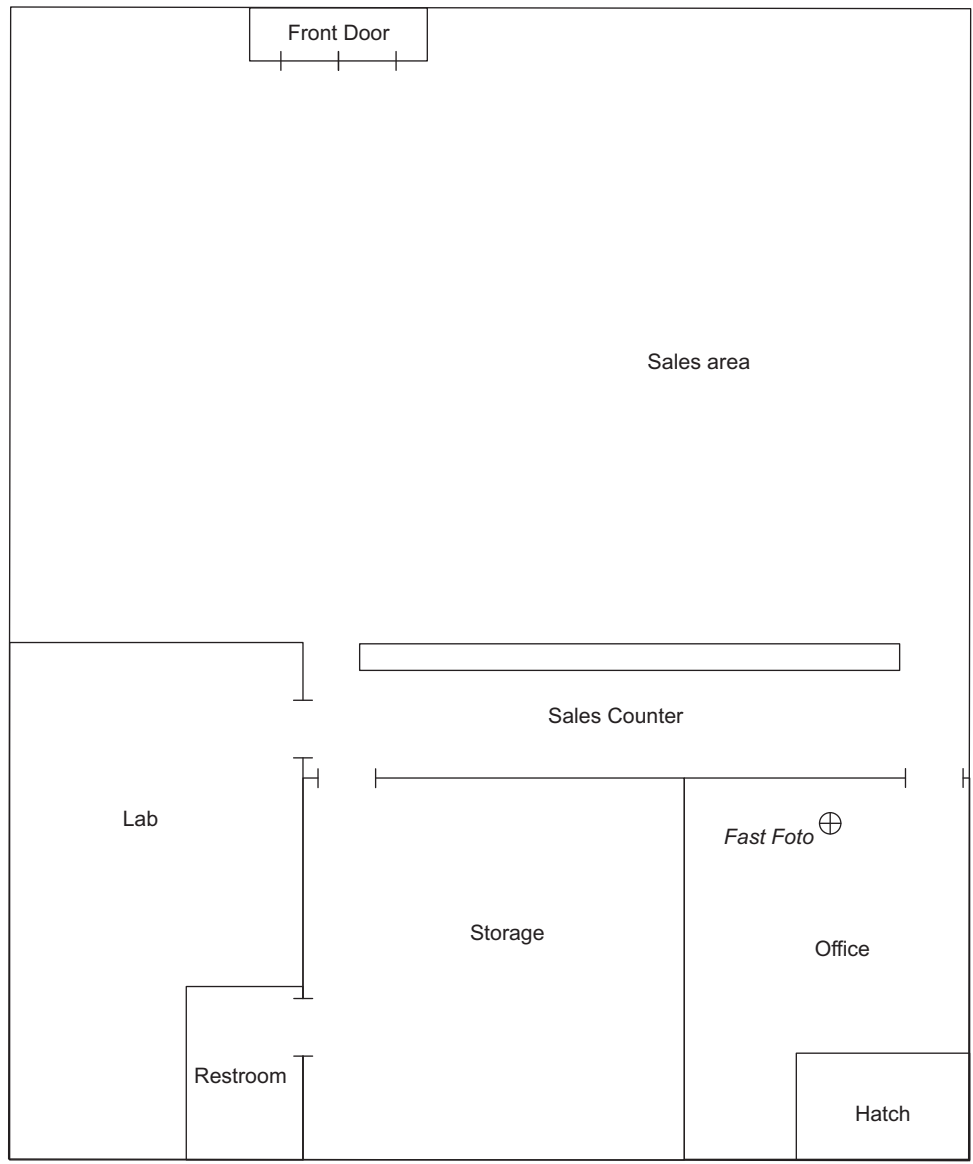
⊕ Approximate indoor-air sampling location

Not to Scale



Shopper's Forum Annex Fairbanks, Alaska	
SAMPLE LOCATIONS, BAMBOO PANDA	
February 2018	31-1-11850-001
 SHANNON & WILSON, INC. <small>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS</small>	Figure 2

Bamboo Panda



Legend

⊕ Approximate indoor-air sampling location

Not to Scale

Shopper's Forum Annex
Fairbanks, Alaska

SAMPLE LOCATIONS, FAIRBANKS FAST FOTO

February 2017

31-1-11850-001

 **SHANNON & WILSON, INC.**
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 3



2/8/2018

Ms. Kristen Freiburger
Shannon & Wilson, Inc.
2355 Hill Road

Fairbanks AK 99709

Project Name: Shoppers Forum Mall Annex
Project #: 31-1-11850-001
Workorder #: 1801415

Dear Ms. Kristen Freiburger

The following report includes the data for the above referenced project for sample(s) received on 1/29/2018 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. RAD130/SKC are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

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

Regards,



Kelly Buettner
Project Manager

WORK ORDER #: 1801415

Work Order Summary

CLIENT: Ms. Kristen Freiburger
Shannon & Wilson, Inc.
2355 Hill Road
Fairbanks, AK 99709

BILL TO: Mr. Seth Robinson
Shannon & Wilson, Inc.
2355 Hill Road
Fairbanks, AK 99709

PHONE: 907-479-0600

P.O. #

FAX: 907-479-5691

PROJECT # 31-1-11850-001 Shoppers Forum Mall

DATE RECEIVED: 01/29/2018

CONTACT: Annex
Kelly Buettner

DATE COMPLETED: 02/08/2018

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	Crawlspace-BP	Passive S.E. RAD130/SKC
02A	Crawlspace-FF (B871V)	Passive S.E. RAD130/SKC
03A	Crawlspace-FF (B874V)	Passive S.E. RAD130/SKC
04A	Fast Foto-Office	Passive S.E. RAD130/SKC
05A	Bamboo Panda Kitchen	Passive S.E. RAD130/SKC
06A	Miguel's-Benquetroom	Passive S.E. RAD130/SKC
07A	Miguel's-Office	Passive S.E. RAD130/SKC
08A	Miguel's-Kitchen	Passive S.E. RAD130/SKC
09A	Lab Blank	Passive S.E. RAD130/SKC
10A	LCS	Passive S.E. RAD130/SKC
10AA	LCSD	Passive S.E. RAD130/SKC

CERTIFIED BY:



Technical Director

DATE: 02/08/18

LABORATORY NARRATIVE
RAD130 Passive SE by Mod EPA TO-17
Shannon & Wilson, Inc.
Workorder# 1801415

Eight Radiello 130 (Solvent) samples were received on January 29, 2018. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

Receiving Notes

Sample identifications for Crawlspace-FF on the Chain of Custody (COC) were not unique. The sampler number was added to each of the sample identifications to ensure uniqueness.

Analytical Notes

The uptake rates were corrected based on average field temperatures if provided. In the absence of field temperatures, the uptake rates determined at 25 deg C were used.

If validated uptake rates were not available, rates were estimated using the chemical's diffusion coefficient in air and the geometric constant of the sampler. Chemicals that are poorly retained by the sorbent over the sampling duration may exhibit a low bias. All concentrations calculated using estimated rates are qualified with a "C" flag.

To calculate ug/m³ concentrations in the Lab Blank, a sampling duration of 1471 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

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

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

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

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

Client Sample ID: Crawlspace-BP

Lab ID#: 1801415-01A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	2.8	34

Client Sample ID: Crawlspace-FF (B871V)

Lab ID#: 1801415-02A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	1.7	21

Client Sample ID: Crawlspace-FF (B874V)

Lab ID#: 1801415-03A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	1.6	20

Client Sample ID: Fast Foto-Office

Lab ID#: 1801415-04A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	0.70	8.4

Client Sample ID: Bamboo Panda Kitchen

Lab ID#: 1801415-05A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	0.81	9.6

Client Sample ID: Miguel's-Benqueroom

Lab ID#: 1801415-06A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	1.1	13

**Summary of Detected Compounds
VOCS BY PASSIVE SAMPLER - GC/MS**

Client Sample ID: Miguel's-Office

Lab ID#: 1801415-07A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	1.1	13

Client Sample ID: Miguel's-Kitchen

Lab ID#: 1801415-08A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	1.2	1.2	14



Client Sample ID: Crawlspace-BP

Lab ID#: 1801415-01A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013009sim	Date of Collection:	1/24/18 3:21:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 12:58 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	1.0	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	2.8	34
cis-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.4	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.8	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 60.8F , duration time = 1456 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Client Sample ID: Crawlspace-FF (B871V)

Lab ID#: 1801415-02A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013010sim	Date of Collection:	1/24/18 3:19:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 01:23 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	1.0	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	1.7	21
cis-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.4	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.8	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 60.8F , duration time = 1459 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130



Air Toxics

Client Sample ID: Crawlspace-FF (B874V)

Lab ID#: 1801415-03A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013011sim	Date of Collection:	1/24/18 3:00:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 01:48 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	1.0	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	1.6	20
cis-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.4	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.7	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 60.8F , duration time = 1470 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130



Air Toxics

Client Sample ID: Fast Foto-Office

Lab ID#: 1801415-04A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013012sim	Date of Collection:	1/24/18 3:15:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 02:13 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	1.0	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	0.70	8.4
cis-1,2-Dichloroethene	0.20	2.2	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.7	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 68.0F , duration time = 1459 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130



Client Sample ID: Bamboo Panda Kitchen

Lab ID#: 1801415-05A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013013sim	Date of Collection:	1/24/18 3:14:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 02:37 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	1.0	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	0.81	9.6
cis-1,2-Dichloroethene	0.20	2.2	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.7	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 68.0F , duration time = 1464 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Client Sample ID: Miguel's-Benqueroom

Lab ID#: 1801415-06A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013014sim	Date of Collection:	1/24/18 3:08:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 03:02 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	1.0	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	1.1	13
cis-1,2-Dichloroethene	0.20	2.2	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.6	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 71.6F , duration time = 1463 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130



Client Sample ID: Miguel's-Office

Lab ID#: 1801415-07A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013015sim	Date of Collection:	1/24/18 3:10:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 03:27 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	1.0	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	1.1	13
cis-1,2-Dichloroethene	0.20	2.2	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.6	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 71.6F , duration time = 1463 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130



Air Toxics

Client Sample ID: Miguel's-Kitchen

Lab ID#: 1801415-08A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013016sim	Date of Collection:	1/24/18 3:07:00 PM
Dil. Factor:	1.00	Date of Analysis:	1/30/18 03:51 PM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.99	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	1.2	14
cis-1,2-Dichloroethene	0.20	2.2	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.6	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 75.2F , duration time = 1471 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130

Client Sample ID: Lab Blank

Lab ID#: 1801415-09A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013005sim	Date of Collection:	NA
Dil. Factor:	1.00	Date of Analysis:	1/30/18 10:55 AM
		Date of Extraction:	1/30/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.99	Not Detected	Not Detected
Tetrachloroethene	0.10	1.2	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.20	2.2	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	2.3	Not Detected C	Not Detected C
1,1-Dichloroethene	0.40	3.6	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 75.2F , duration time = 1471 minutes.

Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130



Air Toxics

Client Sample ID: LCS

Lab ID#: 1801415-10A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013003sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/30/18 09:46 AM
		Date of Extraction: 1/30/18

Compound	%Recovery	Method Limits
Trichloroethene	102	70-130
Tetrachloroethene	98	70-130
cis-1,2-Dichloroethene	98	70-130
trans-1,2-Dichloroethene	103	70-130
1,1-Dichloroethene	100	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130

Client Sample ID: LCSD

Lab ID#: 1801415-10AA

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	c013004sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 1/30/18 10:12 AM
		Date of Extraction: 1/30/18

Compound	%Recovery	Method Limits
Trichloroethene	102	70-130
Tetrachloroethene	100	70-130
cis-1,2-Dichloroethene	96	70-130
trans-1,2-Dichloroethene	105	70-130
1,1-Dichloroethene	95	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130

Laboratory Data Review Checklist for Air Samples

Completed by:	Cacy Wilfer		
Title:	Environmental Engineering Staff	Date:	Feb 22, 2018
CS Report Name:	Shopper's Forum Mall Annex 31-1-11850	Report Date:	Feb 8, 2018
Consultant Firm:	Shannon & Wilson, Inc. (Shannon & Wilson)		
Laboratory Name:	Eurofins Air Toxics, Inc (Eurofins)	Laboratory Report Number:	1801415
ADEC File Number:	102.38.100	ADEC Haz ID:	3683

1. Laboratory

- a. Did a NELAP certified laboratory receive and perform all of the submitted sample analyses?

Yes No NA (Please explain.) Comments:

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses NELAP approved?

Yes No NA (Please explain.) Comments:

Samples were analyzed by Eurofins of Folsom, CA; a NELAP certified laboratory.

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?

Yes No NA (Please explain.) Comments:

- b. Correct analyses requested?

Yes No NA (Please explain) Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample condition documented -Samples collected in gas tight, opaque/dark Summa canisters or other ADEC approved container? Canister vacuum/pressure checked, recorded upon receipt and contained no open valves?

Yes No NA (Please explain) Comments:

Documentation of the sample condition was not provided in a sample receipt form. However, the case narrative noted that the samples were received in good condition and in the appropriate containers.

b. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum etc.?

Yes No NA (Please explain) Comments:

A sample receipt form was not provided but the laboratory noted that the samples were received in good condition and in the appropriate containers.

c. Data quality or usability affected? (Please explain.)

Yes No NA (Please explain) Comments:

See above.

4. Case Narrative

a. Present and understandable?

Yes No NA (Please explain) Comments:

b. Discrepancies, errors or QC failures identified by the lab?

Yes No NA (Please explain) Comments:

Sample uptake rates were corrected based on the average temperatures provided.

If validated uptake rates were not available, rates were estimated using the chemicals diffusion coefficient in air and the geometric constant of the sampler. Chemicals that are poorly retained by the sorbent over the sampling duration may exhibit a low bias. All concentrations calculated using estimated rates are qualified with a 'C' flag.

c. Were all corrective actions documented?

Yes No NA (Please explain) Comments:

Corrective actions were not required.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

The case narrative noted that the sample concentrations using estimated rates are considered estimated, and are flagged 'C' for these results.

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes No NA (Please explain) Comments:

The COC also requested the analysis of vinyl chloride. However, the analyte cannot be reported when using passive adsorbent samplers. The Shannon & Wilson PM was notified and requested the analysis of the remaining analytes.

Additionally, the laboratory noted the duplicates were not uniquely identified. The results are not affected by this discrepancy.

b. Samples analyzed within 30 days of collection or within the time required by the method?

Yes No NA (Please explain) Comments:

c. Are the reported PQLs less than the Target Screening Level or the minimum required detection level for the project?

Yes No NA (Please explain) Comments:

d. Data quality or usability affected?

Comments:

No; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per analysis and 20 samples?

Yes No NA (Please explain) Comments:

ii. All method blank results less than PQL?

Yes No NA (Please explain) Comments:

Project analytes were not detected in the method blanks.

iii. If above PQL, what samples are affected?

Comments:

None; project analytes were not detected in the method blanks.

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?

Yes No NA (Please explain) Comments:

Project analytes were not detected in the method blanks.

v. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. One LCS/LCSD or one LCS and a sample/sample duplicate pair reported per analysis and 20 samples?

Yes No NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

Yes No NA (Please explain) Comments:

iii. Precision - All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable.

Yes No NA (Please explain) Comments:

The RPDs were calculated by Shannon & Wilson and were less than 20% as recommended for the method by the National Functional Guidelines.

iv. If %R or RPD is outside of acceptable limits, what samples are affected?

Yes No NA (Please explain) Comments:

The percent recoveries and RPDs were within acceptance criteria.

v. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain) Comments:

The percent recoveries and RPDs were within acceptance criteria.

vi. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

c. Surrogates

i. Are surrogate recoveries reported for field, QC and laboratory samples?

Yes No NA (Please explain) Comments:

ii. Accuracy - All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable.

Yes No NA (Please explain) Comments:

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

Yes No NA (Please explain) Comments:

The surrogate recoveries were within acceptance criteria.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

d. Field Duplicate

i. One field duplicate submitted per analysis and 10 type (soil gas, indoor air etc.) samples?

Yes No NA (Please explain) Comments:

ii. Submitted blind to lab?

Yes No NA (Please explain) Comments:

The field-duplicate sample and parent sample were both named "Crawlspace FF."

iii. Precision - All relative percent differences (RPD) less than specified DQOs? (Recommended: 25 %)

$$\text{RPD (\%)} = \text{Absolute Value of: } \frac{(R_1 - R_2)}{((R_1 + R_2)/2)} \times 100$$

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes No NA (Please explain) Comments:

The field-duplicate RPDs were within the recommended DQO of 25%, where calculable.

iv. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

e. Field Blank (If not used explain why).

Yes No NA (Please explain) Comments:

A field blank sample was not required for this project.

i. All results less than PQL?

Yes No NA (Please explain) Comments:

A field blank sample was not required for this project.

ii. If above PQL, what samples are affected?

Comments:

N/A; a field blank sample was not required for this project.

iii. Data quality or usability affected? (Please explain.)

Comments:

No; see above.

7. Other Data Flags/Qualifiers

a. Defined and appropriate?

Yes

No

NA (Please explain)

Comments:

Additional data flags or qualifiers are not required.

Reset Form

Updated: 2/2015

PASSIVE SAMPLING LOG

Address 1255 Airport Way, Fairbanks, AK

Project number 31-1-11850-001

Weather -25°F

Project name Shopper's Forum

Sample ID Miguel's Office

Initials KRF/CRW

time (start) 1447

date (start) 1/23/2018

time (end) 1510

date (end) 1/24/2018

Duplicate —

dup. time —

Sample tube serial # B873V

Lab Eurofins Air Toxics

Duplicate tube serial #

Sampler Radiello 130

Notes On filing cabinet next to for work computer
21.5 °C indoor air temp

PASSIVE SAMPLING LOG

Address 1255 Airport Way, Fairbanks, AK

Project number 31-1-11850-001

Weather -25°F

Project name Shopper's Forum

Initials KRF/CRW

Sample ID Miguel's Banquet Room time (start) 1445 date (start) 1/23/2018

time (end) 1508 date (end) _____

Duplicate _____ dup. time _____

Sample tube serial # B868V

Lab Eurofins Air Toxics

Duplicate tube serial # _____

Sampler Radiello 130

Notes On decoration near the dashboard display
21.5°C indoor air temp

PASSIVE SAMPLING LOG

Address 1255 Airport Way, Fairbanks, AK

Project number 31-1-11850-001

Weather -25°F

Project name Shopper's Forum

Initials KRF/CRW

Sample ID Bamboo Panda - Kitchen time (start) 1450 date (start) 1/23/2018

time (end) 1514 date (end) 1/24/2018

Duplicate ← dup. time -

Sample tube serial # B876V

Lab Eurofins Air Toxics

Duplicate tube serial # _____

Sampler Radiello 130

Notes In back near freezer
20.0°C indoor or temp

PASSIVE SAMPLING LOG

Address 1255 Airport Way, Fairbanks, AK

Project number 31-1-11850-001

Weather -25 °F

Project name Shopper's Forum

Initials KRF/CRW

Sample ID Fairbanks Post Office time (start) 1456 date (start) 1/23/2018

time (end) 1515 date (end) 1/24/2018

Duplicate ————— dup. time —

Sample tube serial # B872V

Lab Eurofins Air Toxics

Duplicate tube serial # —————

Sampler Radiello 130

Notes Hanging on papermark in immediate right after
entering office
20.1 °C indoor or temp

PASSIVE SAMPLING LOG

Address 1255 Airport Way, Fairbanks, AK

Project number 31-1-11850-001

Project name Shopper's Forum

Weather -25°F

Initials KRF/CRW

Sample ID Fast Foto Crawl Space time (start) 1500 date (start) 1/23/2018

time (end) ~~1430~~ date (end) 1/24/2018

Duplicate Duplicate dup. time 1430 ^{KRF}

Sample tube serial # B871V

1519

Lab Eurofins Air Toxics

Duplicate tube serial # B874V

dup end
1500

Sampler Radiello 130

Notes

Hangy from wall flaring in crawl space midway
back from building
16.5°C indoor air temp

PASSIVE SAMPLING LOG

Address 1255 Airport Way, Fairbanks, AK

Project number 31-1-11850-001

Weather -25°F

Project name Shopper's Forum

Initials KRF/CRW

Sample ID Bamboo Crawl Space time (start) 1505 date (start) 1/23/2018

time (end) 1521 date (end) 1/24/2018

Duplicate — dup. time —

Sample tube serial # B875V

Lab Eurofins Air Toxics

Duplicate tube serial #

Sampler Radiello 130

Notes Hazy underneath flooring midway through Bamboo Panels
16.4 °C indoor air temperature

PASSIVE SAMPLING LOG

Address 1255 Airport Way, Fairbanks, AK

Project number 31-1-11850-001

Weather -25°F

Project name Shopper's Forum

Sample ID Miguel's - Kitchen

Initials KRF/CRW

time (start) 1436 date (start) 1/23/2018

time (end) 1507 date (end) 1/24/2018

Duplicate —

dup. time —

Sample tube serial # B869V

Lab Eurofins Air Toxics

Duplicate tube serial #

Sampler Radiello 130

Notes Hanging in cubby area behind reception desk.

24.4°C



Date: February 26, 2018
To: Gavora, Inc.
Attn: Mr. Rudy Gavora
Re: February 2018 Air-Sampling Report
Shopper's Forum Annex
ADEC File No. 102.38.100

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland