

December 19, 2018

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

Attn: Mr. Rudy Gavora

**RE: 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 report documenting four consecutive, quarterly indoor- and crawlspace-air monitoring events at the Shopper's Forum Mall Annex (Annex), located at 1255 Airport Way in Fairbanks, Alaska. These samples were collected in response to the Alaska Department of Environmental Conservation's (ADEC) *Notice of Violation* (NOV) dated July 12, 2017 noting indoor- and crawlspace-air samples were to be collected on a quarterly basis for one full year. That letter also requested action to characterize soil and groundwater on and downgradient of the Shopper's Forum Mall property and sewer lines. Gavora, Inc. (Gavora) and The City of Fairbanks (CoF) entered an agreement, dated November 20, 2017, to divide the requested actions between the two parties. Gavora is to be responsible for monitoring the effectiveness of vapor-intrusion mitigation measures at the Annex, and CoF is responsible for performing the remaining site-characterization actions.

This letter addresses only the quarterly vapor-intrusion monitoring actions performed at the Annex. The objective of our services 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. Our scope of services for this project included:

- collecting indoor- and crawlspace-air samples at select locations within the Annex;
- preparing summary reports documenting sampling activities and analytical results; and
- submitting the summary reports to you and ADEC.

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

Details regarding our sampling activities are documented in each quarterly report titled *Indoor-Air and Crawlspace-Air Sampling Summary Report*, dated December 21, 2017, February 26, 2018, May 3, 2018, and August 15, 2018. These reports were submitted to you and ADEC.

RESULTS

We present the historical PCE and TCE analytical results for the indoor- and crawlspace-air samples in Table 1. For the purposes of our assessment we will focus on the last four sampling events (October 2017, January 2018, April 2018, and July 2018). Additional analytical results are provided in the individual quarterly reports referenced above.

PCE was detected in each quarterly project sample at concentrations below the ADEC target levels. TCE was detected in the July 2018 crawlspace samples at concentrations below the ADEC target levels (Table 1); TCE was not detected in indoor-air samples. 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.

RECOMMENDATIONS

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

- Continue operating the sub-slab depressurization system.
- Collect indoor- and crawlspace-air samples on an annual basis to monitor the effectiveness of the sub-slab depressurization system. Based on the results, annual samples should be collected in late summer to early fall.

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 at the time of our sampling activities. 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 of 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

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SHANNON & WILSON, INC.

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.

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 – Historical Air-Sample Results – Crawlspace and Indoor Air
Figure 1 – Sample Locations, Miguel's
Figure 2 – Sample Locations, Bamboo Panda
Figure 3 – Sample Locations, Fairbanks Fast Foto
Important Information about Your Geotechnical/Environmental Report

**TABLE 1
HISTORICAL AIR-SAMPLE RESULTS
CRAWLSPACE AND INDOOR AIR, SHOPPER'S FORUM 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	
	April 2018	14	<1.0			x	x	
July 2018	7.0	<1.0			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	
April 2018	16	<1.0			x	x		
July 2018	7.3	<1.0			x	x		

**TABLE 1
HISTORICAL AIR-SAMPLE RESULTS
CRAWLSPACE AND INDOOR AIR, SHOPPER'S FORUM 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 - 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	
	January 2018	13	<1.0			x	x	
	April 2018	15	<1.0			x	x	
	July 2018	7.3	<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	
	April 2018	48	<1.0			x	x	
July 2018	190	1.2			x	x		

**TABLE 1
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CRAWLSPACE AND INDOOR AIR, SHOPPER'S FORUM 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
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
	April 2018	10	<1.0			x	x
July 2018	23	<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
	April 2018	40	<1.0			x	x
July 2018	150	1.1			x	x	

TABLE 1
HISTORICAL AIR-SAMPLE RESULTS
CRAWLSPACE AND INDOOR AIR, SHOPPER'S FORUM 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
	April 2018	23	<1.0			x	x
July 2018	9.0	<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.

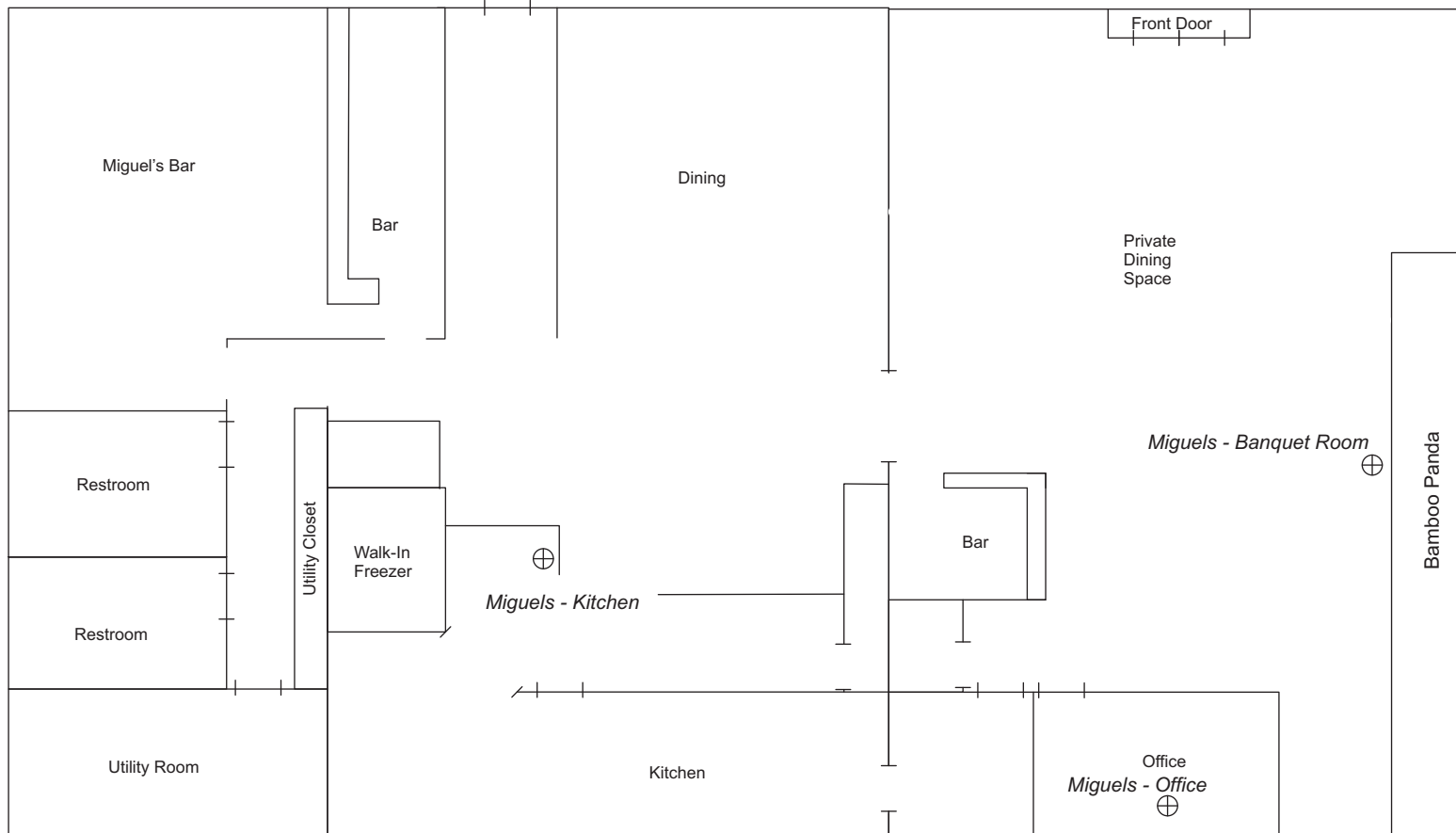
$\mu\text{g}/\text{m}^3$ microgram per cubic meter

< 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.




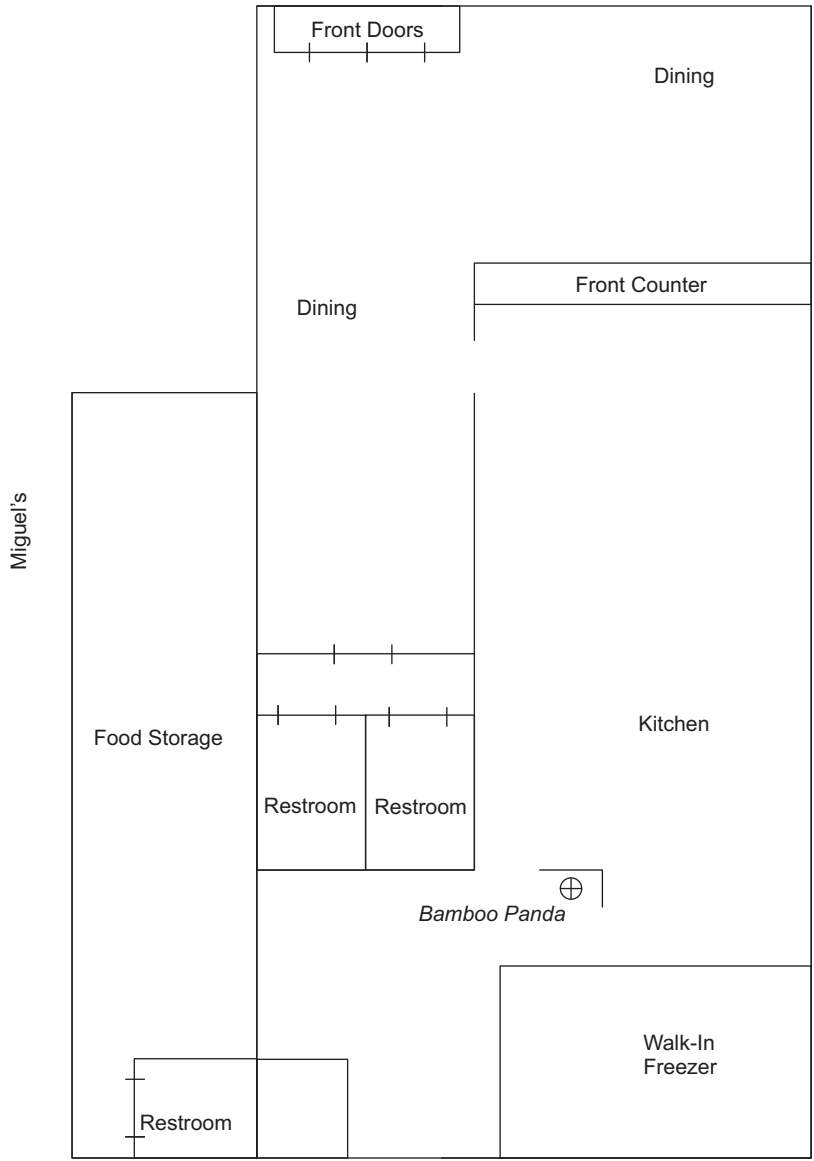
Not to Scale

Legend

⊕ Approximate indoor-air sampling location




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



Legend

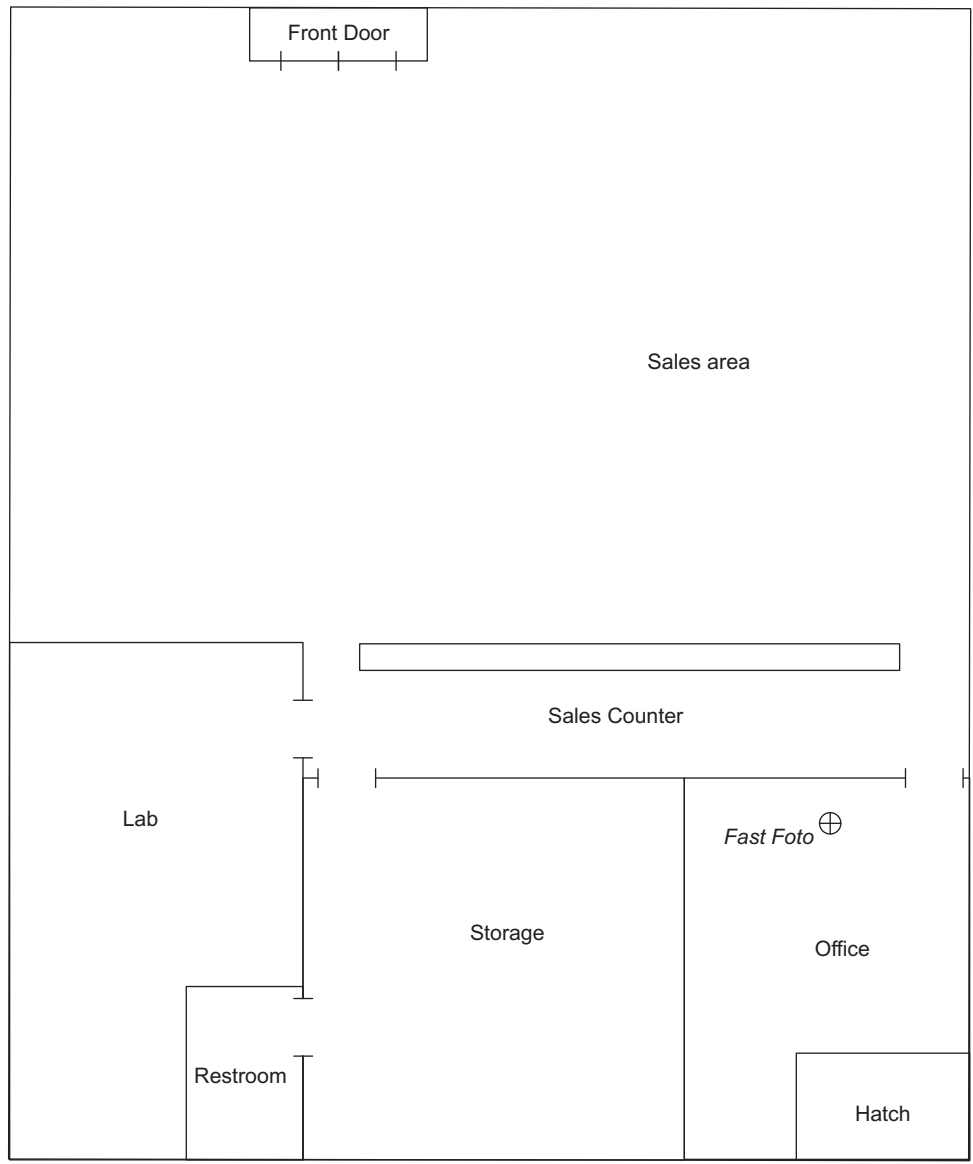
⊕ Approximate indoor-air sampling location

Not to Scale

Shopper's Forum Annex Fairbanks, Alaska	
SAMPLE LOCATIONS, BAMBOO PANDA	
December 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

December 2018

31-1-11850-001

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

Figure 3





Date: December 19, 2018
To: Gavora, Inc.
Attn: Mr. Rudy Gavora
Re: Indoor-Air and Crawlspace-Air Sampling
Summary 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