

**Final Report
Limited Designated Substances Survey**

**Algonquin College
B Building
Sand Pits
1385 Woodroffe Avenue
Ottawa, ON K2G 1V8**

InAIR Project #18c050

Prepared for:

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By:

InAIR Environmental Ltd.

Executive Summary

On March 16th, 2018, Connor Algie, and Jeremy Salgo, InAIR's Junior Environmental Engineers, performed a Limited Designated Substances Survey (DSS) of the Building B Sand Pits of Building B of Algonquin College at 1385 Woodroffe Avenue, in Ottawa, Ontario.

The survey was conducted at the request of Mr. Ralph Gethings, Compliance Supervisor at Algonquin College. The intent of the survey was to identify any suspect Designated Substances (DS's) present in the sand Pits of Building B.

Based on the visual inspection and the laboratory analytical results, the following Designated Substances are present in the areas surveyed: asbestos, mercury, and silica.

Asbestos

Based on the on-site visual inspection and the laboratory results of samples collected during the site visit, the 2018 survey by InAIR found that two (2) suspect materials exceeded the limits of the Ontario asbestos standard of 0.5% asbestos content by weight (Ontario Regulation 278-05). Additionally, one (1) suspected ACM was observed that was inaccessible. At this time, it should be treated as asbestos containing until proven otherwise by bulk sampling. A floor plan of the locations of the identified ACM's marked can be found in the Appendix. The following materials are considered asbestos containing materials:

- Pipe sealant – 20% amosite asbestos
- Parging – 30% chrysotile asbestos
- Exposed Parging - Not sampled - likely containing asbestos

Based on the laboratory results, the following is recommended:

R1. It is recommended that all necessary precautions be taken to minimize any disturbance of the building materials that contain asbestos. Any questions about the appropriate procedures for working near asbestos should be addressed to the workers' supervisor. It is also recommended that any handling and disposal of asbestos containing materials (ACM's) that are disturbed be completed by competent personnel trained in the removal of asbestos and the minimization of asbestos exposure to workers. All work that will disturb asbestos containing materials should be completed in accordance with the Ontario Regulation 278-05.

Mercury

Mercury vapour may be present in the fluorescent lamp tubes, bulbs, and HID (High-Intensity Discharge) lighting. Mercury may also be present as a component within certain electrical equipment such as position dependent switches, batteries, and pressure gauges as well as potentially being present in paints and adhesives. Removal of mercury-containing materials and equipment shall be completed following all



applicable regulations and guidelines (O. Reg 490/09). According to R.R.O. 1990, Reg. 347, disposal of fluorescent lamp tubes and bulbs should be conducted in a safe manner keeping the tubes, and bulbs intact and shipped off-site for disposal as hazardous waste or to be recycled (as applicable). Precautions should be taken in and around mercury containing substances if they may be disturbed at any time in order to maintain an airborne concentration below 0.025 milligrams of non-alkyl mercury compounds per cubic meter of air by volume (mg/m^3), and below $0.01 \text{ mg}/\text{m}^3$ of alkyl mercury compounds (Ontario Regulation 490/09).

During the 2018 survey, both broken and intact fluorescent lamp tubes were encountered on the ground at various locations throughout the Building B Sand Pits.

It is unlikely that mercury levels from the fluorescent lamp tubes encountered during the survey will exceed the allowable TWAEV of 0.025 milligrams of non-alkyl mercury compounds per cubic meter of air by volume (mg/m^3), and below $0.01 \text{ mg}/\text{m}^3$ of alkyl mercury compounds (Ontario Regulation 490/09). However, to mitigate any future issues with the lamp tubes, InAIR recommends the following:

R2. According to R.R.O. 1990, Reg. 347, disposal of fluorescent lamp tubes and bulbs should be conducted in a safe manner keeping the tubes, and bulbs intact and shipped off-site for disposal as hazardous waste or to be recycled (as applicable). Precautions should be taken in and around mercury containing substances if they may be disturbed at any time in order to maintain an airborne concentration below 0.025 milligrams of non-alkyl mercury compounds per cubic meter of air by volume (mg/m^3), and below $0.01 \text{ mg}/\text{m}^3$ of alkyl mercury compounds (Ontario Regulation 490/09).

Silica

The building surveyed is constructed of concrete foundations, ceilings (above drop ceiling, and drywall ceilings), floors (below wood panel flooring, carpet, and vinyl floor tile) and wallboard materials that are likely to contain silica throughout the subject location. These materials require consideration in advance of their disturbance in order to maintain an airborne concentration below 0.10 milligrams of Quartz and Tripoli silica per cubic meter of air by volume (mg/m^3), and below $0.05 \text{ mg}/\text{m}^3$ of Cristobalite silica (Ontario Regulation 490/09). Due to the visibly high levels of airborne sand present in the Building B Sand Pits, it is likely that silica levels exceed the previously stated allowable TWAEV for silica (O. Reg. 490/09, ss. 33, 34).

Based on these observations with regards to silica, InAIR recommends the following:

R3. During any work being conducted within the Building B Sand Pits, it is recommended that it be performed in accordance with the Ontario Ministry of Labour “Silica on Construction Projects” Guideline. Appropriate personal protective equipment, including respirators with cartridges that are designed to protect against silica dust, is to be worn at all times by anyone entering the sand pits area.



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1.0 OVERVIEW

1.1 Introduction

On March 16th, 2018, Connor Algie, and Jeremy Salgo, InAIR's Junior Environmental Engineers, performed a Limited Designated Substances Survey (DSS) of the Building B Sand Pits of Building B of Algonquin College at 1385 Woodroffe Avenue, in Ottawa, Ontario.

The survey was conducted at the request of Mr. Ralph Gethings, Compliance Supervisor at Algonquin College. The intent of the survey was to identify any suspect Designated Substances (DS's) present in the sand Pits of Building B.

Based on the visual inspection and the laboratory analytical results, the following Designated Substances (DS's) are present in the areas surveyed: asbestos, mercury, and silica.

As a health and safety measure, and as an environmental due diligence measure, Algonquin College has requested that InAIR conduct a limited Designated Substances Survey to determine what, if any, potentially hazardous building materials may be present in the project area. In particular, the survey and sampling were conducted to determine if the potential suspect asbestos containing materials found in the areas of concern meet the Ontario asbestos standard of 0.5% asbestos content by weight (Ontario Regulation 278-05). Also, the suspect lead containing paints were sampled and analyzed to meet the Health Canada regulatory limit of 90 parts per million (ppm) for lead content in paint (Surface Coating Materials Regulation, Health Canada, SOR/2005, updated, 2011).

There is a total of eleven (11) designated substances included in this survey:

- Acrylonitrile
- Arsenic
- Asbestos
- Benzene
- Coke Oven Emissions
- Ethylene Oxide
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl Chloride

In addition to these substances, a visual inspection was conducted for the following potentially hazardous substances:

- Urea-Formaldehyde Foam Insulation (UFFI)

- Polychlorinated Biphenyls
- Mould
- Ozone depleting substances (ODS's)

1.2 Survey Methodology

The survey consisted of a representative survey of the walls, floors, and ceilings of the subject locations. In order to meet the objective of the survey, the following tasks were accomplished by InAIR:

- The performance of a systematic on-site survey/investigation of the areas in question to document the possible location, quantity of material, and condition of all designated substances.
 - For suspected asbestos containing materials, percent concentration, asbestos type, accessibility, and friability are recorded.
- Collection of samples as per Ontario Regulation 278-05, along with laboratory submission of the samples of suspect asbestos containing materials. Other potentially hazardous materials such as lead were also sampled.
- Completion of a Designated Substance Report (DSR) summarizing the results for comparison to regulatory requirements.
- The report will provide Algonquin College with recommendations for use by contractors regarding various measures that should be followed to handle these Designated Substances during any projects being conducted in the Building B Sand Pits.

The survey was limited to the readily accessible areas that were accessible by non-destructive means. Destructive testing was not included in the investigation. Some areas such as wall cavities and select areas within ceiling plenums were not surveyed due to their inaccessibility. No confined space was accessed for the purpose of this report.

It is possible that the designated substances aforementioned are present in non-accessible areas and concealed spaces (i.e., wall and ceiling cavities), or confined spaces.

All suspect asbestos containing materials were sent under a Chain-of-Custody form to EMSL Laboratories in Ottawa, Ontario for analysis using Polarized Light Microscopy (PLM) with dispersion staining. The analytical method corresponds to the United States Environmental Protection Agency (US EPA) Method 600 (R-93/116 and M4-82-020) for the determination of asbestos in bulk materials. EMSL Laboratories is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos analysis of bulk samples.

All suspect lead-containing paints were sent under a Chain-of-Custody form to EMSL Laboratories located in Mississauga, Ontario for analysis. The laboratory analyzed the samples using EPA's method SW-846 for the determination of trace elements in waters and wastes by flame atomic absorption spectroscopy (F-AAS).

1.3 Results

Acrylonitrile

Acrylonitrile is a clear, colourless and toxic liquid. It may be present in stable polymer forms in various paints and adhesives throughout the areas surveyed. However, it is not expected that airborne acrylonitrile concentrations from any current activities or planned work will exceed the maximum allowable Time-Weighted Average Exposure Value (TWAEV) of 2 parts per million (ppm) (O. Reg. 490/09, s. 16 (2)).

Arsenic

Arsenic or arsenic-containing compounds may be present in stable polymer forms in various paints and adhesives throughout the areas surveyed. However, it is not expected that airborne arsenic concentrations from planned work will exceed the maximum allowable Time-Weighted Average Exposure Value (TWAEV) of 0.01 mg/m³ (O. Reg. 490/09, ss. 33, 34)

Asbestos

The Ontario regulations (O.Reg. 278/05, s. 1 (1)) indicate that all materials that are found by lab analysis to contain 0.5% or greater asbestos content are to be considered asbestos containing.

During the 2018 survey conducted by InAIR, a total of twenty-two (22) bulk samples of six (6) types of suspect asbestos containing materials were collected (Tar; Pipe Sealant; Parging cement; Tar Paper; Drywall Joint Compound; Red Firestop). These suspect materials were found in the Building B Sand Pits.

The laboratory report of analysis indicated that two (2) materials collected by InAIR were above the regulatory limit of 0.5% for asbestos content (O.Reg. 278/05, s.1 (1)). The laboratory report of analysis of the bulk samples indicated that the remaining materials that were sampled by InAIR were found to be non-detected (ND) with respect to asbestos content. Additionally, one (1) suspected ACM was observed that was inaccessible, at this time it should be treated as asbestos containing until proven otherwise by bulk sampling. Photographic documentation of this suspected ACM can be found in the appendix of this report.

A summary of ACM's found in Building B Sand Pits, including material type, asbestos type and percent content, condition, and quantity can be seen in Table 1.

Table 1 Summary of Asbestos Containing Materials Found in Building B Sand Pits during 2018 Survey

Sample Number	Material Description	Asbestos Content & Type	Condition	Quantity
AC-BP-ASB-02 (a-c)	Pipe sealant	20% Amosite	Poor	3 fittings



Sample Number	Material Description	Asbestos Content & Type	Condition	Quantity
AC-BP-ASB-03 (a-c)	Parging	30% Chrysotile	Good	2 elbows
Not Sampled	Exposed Parging	Not Sampled	Poor	1 Elbow

Note: m² – square meters
 m – linear meters

According to governmental regulation, the building materials outlined in Table 1 are to be considered asbestos containing. All applicable governmental regulations regarding the abatement and disposal of the asbestos containing materials should be followed. The following recommendations are made concerning the ACMs in the surveyed area:

- R1. It is recommended that all necessary precautions be taken to minimize any disturbance of the building materials that contain asbestos. Any questions about the appropriate procedures for working near asbestos should be addressed to the workers' supervisor. It is also recommended that any handling and disposal of asbestos containing materials (ACM's) that are disturbed be completed by competent personnel trained in the removal of asbestos and the minimization of asbestos exposure to workers. All work that will disturb asbestos containing materials should be completed in accordance with the Ontario Regulation 278-05.**

Any materials found to be homogeneous (of the same or similar nature of kind and uniform in structure or composition throughout) to the asbestos containing materials outlined in Table 1 should be considered as ACMs unless proven otherwise by bulk sampling. All applicable governmental regulations regarding the abatement and disposal of the asbestos containing materials should be followed. Note that the asbestos containing pipe sealant was only observed on the three (3) where the samples were collected. It is not known if it is present at any other locations. No other pipe sealant was seen during InAIR's site visit.

Please see Appendix for the laboratory reports of analysis of the suspect asbestos samples collected from the subject location and a floor plan of the locations of the identified and suspected ACMs marked.

If other building materials within the project area are identified as suspect ACM's, it is recommended that these materials be sampled prior to any disturbance.

Benzene

Benzene, an aromatic hydrocarbon, is likely to be present in a stable form within roofing materials, paints, and adhesives as a constituent of hydrocarbon based mixtures. However, over time, the benzene compound typically volatilizes from these materials and it is released into the ambient air. Therefore, it is considered likely that only trace

amounts of benzene presently exist in the building materials. It is unlikely that benzene emissions from any current activities or planned work will exceed the allowable TWAEV of 0.5 parts per million (ppm) (O. Reg. 490/09, ss. 33, 34.).

Coke Oven Emissions

Coke oven emissions were not observed in the areas surveyed of this building.

Ethylene Oxide

Ethylene oxide was not observed in the areas surveyed of this building.

Isocyanates

Isocyanate compounds are likely to be present in the various plastics, foams, coatings, and paints used in the surveyed areas. These compounds may also be present in various building materials such as insulation and elastomers coatings which have been applied to various surfaces. It is unlikely that isocyanate emissions from any current activities or planned work will exceed the allowable TWAEV of 0.005 parts per million (ppm), or 0.02 ppm for Methyl and Ethyl Isocyanate compounds (O. Reg. 490/09, ss. 33, 34.)

Lead

Lead is a naturally occurring metal in the earth crust. It was used as an additive to various paints prior to the mid 1980's. It is also found on different types of soldered joints and piping used in buildings up until the mid 1980's.

The federal Surface Coating Materials Regulation that is under the *Hazardous Products Act* indicates that total lead concentration in a surface coating must not exceed 90 parts per million (ppm) (or, alternatively, 90 micrograms per gram ($\mu\text{g/g}$) or 90 milligrams per kilogram (mg/kg)). Any sample above this regulatory limit is considered to be a lead-based paint.

No suspected lead containing paints were encountered on the day of the 2018 survey. Therefore zero (0) representative samples of suspect lead-containing paints were collected from surfaces in the project area.

It is noted that pipes located within the Building B sand pits may be composed of lead or contain lead soldering. Due to the potential for leakage, no piping was sampled for lead content during the 2018 survey. However, it is noted that any piping that will be disturbed during a project will require that a Project Specific Designated Substances Survey (DSS) be conducted to confirm the composition of any suspect lead containing piping and solder prior to the beginning of the work.

Mercury

InAIR identified fluorescent lamp tubes around the subject area. Mercury vapour may be present in the fluorescent lamp tubes, bulbs, and HID (High-Intensity Discharge) lighting. Mercury may also be present as a component within certain electrical equipment such as position dependent switches, batteries, and pressure gauges as well

as potentially being present in paints and adhesives. Removal of mercury-containing materials and equipment shall be completed following all applicable regulations and guidelines (O. Reg 490/09). According to R.R.O. 1990, Reg. 347, disposal of fluorescent lamp tubes and bulbs should be conducted in a safe manner keeping the tubes, and bulbs intact and shipped off-site for disposal as hazardous waste or to be recycled (as applicable).

During the 2018 survey, both broken and intact fluorescent lamp tubes were encountered on the ground at various locations throughout the Building B Sand Pits.

It is unlikely that mercury levels from the fluorescent lamp tubes encountered during the survey will exceed the allowable TWAEV of 0.025 milligrams of non-alkyl mercury compounds per cubic meter of air by volume (mg/m^3), and below $0.01 \text{ mg}/\text{m}^3$ of alkyl mercury compounds (Ontario Regulation 490/09). However, to mitigate any future issues with the lamp tubes, InAIR recommends the following:

R2. According to R.R.O. 1990, Reg. 347, disposal of fluorescent lamp tubes and bulbs should be conducted in a safe manner keeping the tubes, and bulbs intact and shipped off-site for disposal as hazardous waste or to be recycled (as applicable). Precautions should be taken in and around mercury containing substances if they may be disturbed at any time in order to maintain an airborne concentration below 0.025 milligrams of non-alkyl mercury compounds per cubic meter of air by volume (mg/m^3), and below $0.01 \text{ mg}/\text{m}^3$ of alkyl mercury compounds (Ontario Regulation 490/09).

Silica

The building surveyed is constructed of concrete foundations, ceilings (above drop ceiling, and drywall ceilings), floors (below wood panel flooring, carpet, and vinyl floor tile) and wallboard materials that are likely to contain silica throughout the subject location. These materials require consideration in advance of their disturbance in order to maintain an airborne concentration below 0.10 milligrams of Quartz and Tripoli silica per cubic meter of air by volume (mg/m^3), and below $0.05 \text{ mg}/\text{m}^3$ of Cristobalite silica (Ontario Regulation 490/09). Due to the visibly high levels of airborne sand present in the Building B Sand Pits, it is likely that silica levels exceed the previously stated allowable TWAEV for silica (O. Reg. 490/09, ss. 33, 34).

Based on these observations with regards to silica, InAIR recommends the following:

R3. During any work being conducted within the Building B Sand Pits, it is recommended that it be performed in accordance with the Ontario Ministry of Labour “Silica on Construction Projects” Guideline. Appropriate personal protective equipment, including respirators with cartridges that are designed to protect against silica dust, is to be worn at all times by anyone entering the sand pits area.

Vinyl Chloride



Vinyl chloride (monomer) was not identified in the project area surveyed. Vinyl chloride may be present within PVC piping and conduits.

Polychlorinated Biphenyls (PCB's)

The use of PCB's in building material and equipment ceased in the late 1970's with a few residual products being available during the early 1980's. It should be noted that ballasts in fluorescent light fixtures manufactured before 1980 generally contain PCB's in light ballasts. Unless the ballasts are labelled non-PCB's containing, sampling for PCB content in light ballasts is recommended prior to their disposal.

In accordance with provincial waste management regulations, a material containing PCB's at a concentration of more than fifty (50) parts per million (ppm) by weight (R.R.O. 1990, Reg. 362, s. 1; O. Reg. 232/11, s.1) whether the material is liquid or not, it can be considered a PCB material.

Mould

Mould was not visibly identified within the surveyed area.

Ozone Depleting Substances (ODS's)

In 1994, the federal government filed the Ozone-Depleting Substances Regulations to amend controls on production and consumption of chlorofluorocarbons (CFC's), halons, tetrachloride and methyl chloroform. The Federal Halocarbon Regulations effective July 1, 2009, was filed to ensure uniformity with respect to the release, recovery, and recycling of ODS's and their halocarbon alternatives in refrigeration and air conditioning equipment.

During the 2018 survey conducted by InAIR, there were no ozone depleting substances identified in the project area.

Should any ozone depleting substances be identified at a later date it should be noted that if they are to be disposed of it must be done so in accordance with O. Reg. 463/10: "Ozone Depleting Substances and Other Halocarbons".

Urea-Formaldehyde Foam Insulation (UFFI)

No suspect UFFI or walls where the material would have been injected were identified during the subject project specific area during the site visit.



Report Conditions and Limitations

The findings contained in this report rely on data and information collected during the Limited Designated Substances Survey (DSS) conducted by InAIR Environmental Ltd. of the subject building and is based solely on site conditions present at the time of our survey. The observations presented in this report are based on the specific areas assessed and hence the findings may not apply throughout the entire building (e.g. wall cavities and inaccessible ceiling plenums).

Due to the nature of the survey and the limited data collected, the assessors cannot warrant against undiscovered environmental liabilities. Should additional information become available, InAIR Environmental Ltd. requests that this information be brought to our attention so that we may re-assess the conclusions and recommendations presented herein.

This report is intended for the sole use of Algonquin College and its authorized personnel. InAIR Environmental Ltd. accepts no responsibility for any unauthorized use of the information contained within this report by any third party.

We trust that the information presented in this report meets your current requirements. Should you have any questions or concerns regarding the report please do not hesitate to contact the undersigned.

InAIR Environmental Limited

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Junior Environmental Engineer

Report reviewed by:

Donald M. Weekes, CIH, CSP
Partner



2.0 APPENDIX

Photographic Documentation of Suspected ACM
Floor Plans with Marked ACM's and Suspected ACM's
Laboratory Report of Analysis & COC
Asbestos



2.1 Photographic Documentation of Suspected ACM

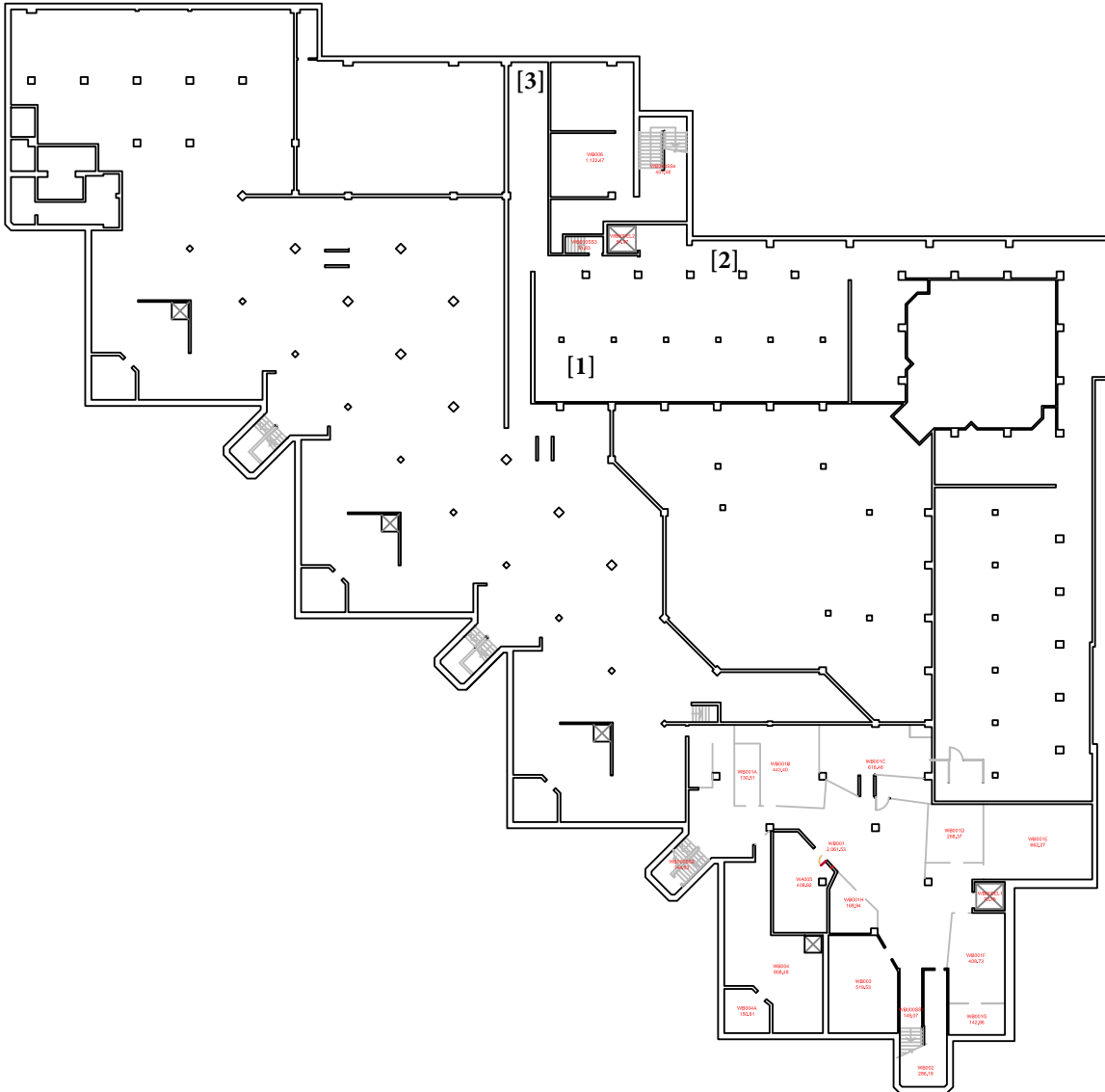


Photo 1: Inaccessible Exposed Parging on Pipe Elbow



2.2 Floor Plans with Marked ACM's and Suspected ACM's

BUILDING B - LOWER LEVEL FLOOR PLAN NOT TO SCALE



Identified ACM Legend:

Positive for Asbestos (>0.5%)

- [1] Pipe Sealant
- [2] Parging
- [3] Exposed Parging*

* Inaccessible on the day of the survey therefore was not sampled. Assumed to be asbestos containing.



Project No.: 17c059
Drawn: CA

Date: 22/08/2017
Reviewed: DW



2.3 Laboratory Reports of Analysis & COC

2.1.1 Asbestos



2.3.1 Laboratory Report of Analysis and COC for Suspect Asbestos Containing Materials



EMSL Canada Inc.

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<http://www.EMSL.com> / ottawalab@EMSL.com

EMSL Canada Order 671800557
Customer ID: 551NAI62
Customer PO:
Project ID:

Attn: Connor Algie
InAIR Environmental, Ltd.
1390 Prince of Wales Drive
Unit 503
Ottawa, ON K2C 3N6
Proj: 18c050
Phone: (613) 224-3863
Fax: (613) 224-2561
Collected: 3/16/2018
Received: 3/16/2018
Analyzed: 3/22/2018

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: AC-BP-ASB-01a **Lab Sample ID:** 671800557-0001

Sample Description: Tar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Black	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-01b **Lab Sample ID:** 671800557-0002

Sample Description: Tar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Black	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-01c **Lab Sample ID:** 671800557-0003

Sample Description: Tar

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/22/2018	Black	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-02a **Lab Sample ID:** 671800557-0004

Sample Description: Pipe sealant

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Gray	0%	80%	20% Amosite	

Client Sample ID: AC-BP-ASB-02b **Lab Sample ID:** 671800557-0005

Sample Description: Pipe sealant

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018					Positive Stop (Not Analyzed)

Client Sample ID: AC-BP-ASB-02c **Lab Sample ID:** 671800557-0006

Sample Description: Pipe sealant

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018					Positive Stop (Not Analyzed)

Client Sample ID: AC-BP-ASB-03a **Lab Sample ID:** 671800557-0007

Sample Description: Parging

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Gray	0%	70%	30% Chrysotile	



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EMSL Canada Order 671800557
 Customer ID: 551NAI62
 Customer PO:
 Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: AC-BP-ASB-03b
Sample Description: Parging

Lab Sample ID: 671800557-0008

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018					Positive Stop (Not Analyzed)

Client Sample ID: AC-BP-ASB-03c
Sample Description: Parging

Lab Sample ID: 671800557-0009

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018					Positive Stop (Not Analyzed)

Client Sample ID: AC-BP-ASB-04a
Sample Description: Tar paper

Lab Sample ID: 671800557-0010

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Black	75%	25%	None Detected	

Client Sample ID: AC-BP-ASB-04b
Sample Description: Tar paper

Lab Sample ID: 671800557-0011

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Black/Silver	60%	40%	None Detected	

Client Sample ID: AC-BP-ASB-04c
Sample Description: Tar paper

Lab Sample ID: 671800557-0012

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Black/Silver	60%	40%	None Detected	

Client Sample ID: AC-BP-ASB-04d
Sample Description: Tar paper

Lab Sample ID: 671800557-0013

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Gray/Black/Yellow	75%	25%	None Detected	

Client Sample ID: AC-BP-ASB-04e
Sample Description: Tar paper

Lab Sample ID: 671800557-0014

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/22/2018	Black	75%	25%	None Detected	

Client Sample ID: AC-BP-ASB-04f
Sample Description: Tar paper

Lab Sample ID: 671800557-0015

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018					Not Submitted



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EMSL Canada Order 671800557
Customer ID: 551NAI62
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Client Sample ID: AC-BP-ASB-04g **Lab Sample ID:** 671800557-0016
Sample Description: Tar paper

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018				Not Submitted	

Client Sample ID: AC-BP-ASB-05a **Lab Sample ID:** 671800557-0017
Sample Description: DWJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	White	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-05b **Lab Sample ID:** 671800557-0018
Sample Description: DWJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	White	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-05c **Lab Sample ID:** 671800557-0019
Sample Description: DWJC

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/22/2018	White	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-06a **Lab Sample ID:** 671800557-0020
Sample Description: Red Firestop

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Red	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-06b **Lab Sample ID:** 671800557-0021
Sample Description: Red Firestop

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/20/2018	Red	0%	100%	None Detected	

Client Sample ID: AC-BP-ASB-06c **Lab Sample ID:** 671800557-0022
Sample Description: Red Firestop

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	3/22/2018	Red	0%	100%	None Detected	



EMSL Canada Inc.

22 Antares Drive Suite 102 Ottawa, ON K2E 7Z6
Phone/Fax: 343-882-6076 / (343) 882-6077
<http://www.EMSL.com> / ottawalab@EMSL.com

EMSL Canada Order 671800557
Customer ID: 551NAI62
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

Analyst(s):

Ewa Krupinska PLM (4)
Hilary Belleville PLM (12)

Reviewed and approved by:

Simon Parent, Laboratory Manager
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Ottawa, ON

Initial report from: 03/22/2018 15:53:27



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Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

671800557

EMSL CANADA, INC.
22 ANTARES DRIVE, SUITE 102
OTTAWA, ON, K2E 7Z6
PHONE: 343-882-6076
FAX: 343-882-6077

Company: <u>EnAIR Environmental Inc. Ltd.</u>		EMSL Customer ID:	
Street: <u>1340 Prince of Wales Dr.</u>		City: <u>Ottawa</u>	
Zip/Postal Code: <u>K2C 3N6</u>	State/Province: <u>ON</u>	Country: <u>Canada</u>	
Telephone #: <u>613-224-3863</u>		Email Address: <u>connor.algie@enairenvironmental.ca</u>	
Project Name/Number: <u>18050</u>		EMSL Project ID (Internal Use Only):	
Please Provide Results: <input type="checkbox"/> Fax <input checked="" type="checkbox"/> Email		Purchase Order:	State/Province Samples Taken:

EMSL-Bill to: Same Different - If Bill to is Different note instructions in Comments**

Third Party Billing requires written authorization from third party

Turnaround Time (TAT) Options* - Please Check

3 Hour 6 Hour 24 Hour 48 Hour 72 Hour 96 Hour 1 Week 2 Week

*For TEM Air 3 hours through 6 hours, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.

PCM - Air <input type="checkbox"/> NIOSH 7400 <input type="checkbox"/> IRSST PCM PLM - Bulk (reporting limit) <input checked="" type="checkbox"/> PLM EPA 600/R-93/116 (<1%) <input type="checkbox"/> 400 PTCT (<0.25%) <input type="checkbox"/> 1000 PTCT (<0.1%) <input type="checkbox"/> PLM EPA NOB (<1%) <input type="checkbox"/> 400 PTCT (<0.25%) <input type="checkbox"/> 1000 PTCT (<0.1%) <input type="checkbox"/> IRSST PLM <input type="checkbox"/> NIOSH 9002 (<1%) <input type="checkbox"/> Other	TEM - Air <input type="checkbox"/> AHERA 40 CFR, Part 763 <input type="checkbox"/> NIOSH 7402 <input type="checkbox"/> EPA Level II TEM - Bulk <input type="checkbox"/> TEM EPA NOB <input type="checkbox"/> IRRST TEM (NYS 198.4) TEM - Dust <input type="checkbox"/> Microvac - ASTM D 5755 <input type="checkbox"/> Wipe - ASTM D6480 TEM - Water <input type="checkbox"/> EPA 100.2 (All fibre sizes) <input type="checkbox"/> EPA 100.2 (Fibres >10µm)	Soil/Rock/Vermiculite <input type="checkbox"/> PLM EPA 600/R-93/116 with milling prep (<0.25%) <input type="checkbox"/> PLM EPA 600/R-93/116 with milling prep (<0.1%) <input type="checkbox"/> TEM EPA 600/R-93/116 with milling prep (<0.1%) <input type="checkbox"/> TEM EPA 600/R-93/116 with milling prep (<0.01%) <input type="checkbox"/> ASTM D7521 Sieve Method <input type="checkbox"/> TEM Qualitative via Filtration Prep <input type="checkbox"/> TEM Qualitative via Drop Mount Prep <input type="checkbox"/> Cincinnati Method EPA 600/R-04/004 - PLM/TEM* *(required for vermiculite in BC and NS)
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Check For Positive Stop - Clearly Identify Homogenous Groups Filter Pore Size (Air Samples): 0.8µm 0.45µm

Samplers Name: Connor Algie Sampler's Signature:

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
AC-BP-ASB-01a	Tor		03/16/18
AC-BP-ASB-01b	"		"
AC-BP-ASB-01c	"		"
AC-BP-ASB-02a	Pipe sealant		"
AC-BP-ASB-02b	"		"
AC-BP-ASB-02c	"		"
AC-BP-ASB-03a	Paving		"

Client Sample # (s): - Total # of Samples: 22

Relinquished (Client): Connor Algie Date: 03/16/18 Time: 2:30

Received (Lab): Connor Algie Date: 3/16/18 Time: 2:30 PM

Comments/Special Instructions: please cc results to Jeremy.salgo@mairenvironmental.ca



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Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

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EMSL CANADA, INC.
22 ANTARES DRIVE STE 102
OTTAWA, ON K2E 7Z6
PHONE: (343) 882-6076
FAX: (343) 882-6077

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
AC-BP-ASB-03b	Paving		03/16/18
AC-BP-ASB-03c	"		"
AC-BP-ASB-04a	Tar paper		"
AC-BP-ASB-04b	"		"
AC-BP-ASB-04c	"		"
AC-BP-ASB-04d	"		"
AC-BP-ASB-04e	"		"
AC-BP-ASB-04f	"		"
AC-BP-ASB-04g	"		"
AC-BP-ASB-05a	DWJC		"
AC-BP-ASB-05b	"		"
AC-BP-ASB-05c	"		"
AC-BP-ASB-06a	Red Firestop		"
AC-BP-ASB-06b	"		"
AC-BP-ASB-06c	"		"
*Comments/Special Instructions:			
* see page 1			