

## TEM Sampling Report

December 8<sup>th</sup>, 2022

Cody Field  
Greytop Commercial Construction inc.  
10 Frazee Avenue  
Dartmouth, Nova Scotia  
B3B 1X4

Project #: 30128

### Microvac Sampling Results - Asbestos in Settled Dust Bicentennial School, 85 Victoria Road, Dartmouth, Nova Scotia

On November 28<sup>th</sup>, 2022, ALL-TECH Environmental Services Ltd. collected five (5) TEM Dust Microvac samples of settled dust for asbestos analyses while on site at Bicentennial School located at 85 Victoria Road in Dartmouth, Nova Scotia. The TEM samples were collected from horizontal surfaces throughout the northwest wing to establish background levels prior to exterior demolition activities.

The Microvac samples were submitted to International Asbestos Testing Laboratories (IATL) Laboratories in Mount Laurel, NJ for asbestos analyses. IATL is an internationally accredited laboratory with NIST-NVLAP, AIHA, and the New York Department of Health (NY-DOH).

#### What is Asbestos?

Asbestos is a generic term which is used to describe a group of naturally occurring fibrous mineral silicates (fibrous rock). Six main types of asbestos are; chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite. Heat, corrosion, and tensile qualities of Asbestos have been so beneficial, that from the dates 1900 to 1980, Asbestos was used worldwide in over 3000 different commercial products. Asbestos has been used in fireproofing materials, friction products, reinforcing building materials, insulations materials (thermal/acoustic), etc.

#### Microvac Dust Sample Results

Samples were collected on a 25mm Settled Dust Sampling cassette loaded with a 0.8 µm MCE filter. The sampling pump used to collect the sample were Gilian® low volume air sampling pumps. Prior to sampling, the pump was calibrated using a TSI® Primary Calibrator Model #4146, Serial No. 41461602006 (NIST Traceable). The samples were analysed by IATL for asbestos content following the ASTM D5755-09 Standard Test Method for Microvacuum Sampling and Indirect Analysis of Settled Dust by TEM for Asbestos. The results of the analyses are presented in Table 1.0.

**Table 1.0**  
**Microvac Analyses of Settled Dust Samples**  
**Bicentennial School**  
**November 28<sup>th</sup>, 2022**

Sample #	Item Sampled	Structures (s/cm <sup>2</sup> )	Asbestos Types Detected
T-01 (Lab # 7533054)	Room 10 - Desk	3700	Chrysotile
T-02 (Lab # 7533055)	Room 10 - Chalkboard	<3700	None Detected
T-03 (Lab # 7533056)	Room 9 – Teacher's Desk	120,000	Chrysotile

Sample #	Item Sampled	Structures (s/cm <sup>2</sup> )	Asbestos Types Detected
T-04 (Lab # 7533057)	Room 9 - Chalkboard	46,300	Chrysotile
T-05 (Lab # 7533058)	Teacher's Room – Center Desk	185,000	Chrysotile

#### TEM (Microvac) Dust Sampling Conclusion

In Canada, no Provincial or Federal guidelines with respect to settled dust sampling and analysis exist. However, in the U.S.A., a considerable number of settled dust analyses for asbestos using TEM have been performed following the Microvac sampling procedure<sup>1</sup>. Based on results from these studies, levels of asbestos in settled dust as determined by the Microvac technique are considered low (No Contamination) if less than 1,000 s/cm<sup>2</sup> (structures per cubic centimeter) are detected, above background (Moderate Contamination) if levels are greater than 10,000 s/cm<sup>2</sup>, and high (significant contamination) if levels are above 100,000 s/cm<sup>2</sup>. Levels above 100,000 s/cm<sup>2</sup> are usually associated with a significant accidental release such as from an asbestos abatement site. Based on the sampling results, Microvac sample number T-03 and T-05 collected show contamination (greater than 100,000 s/cm<sup>2</sup>).

It has been a pleasure providing this service to you. If you should have any questions regarding this report, please do not hesitate to call our office 902-835-3727 or email us [email@toalltech.com](mailto:email@toalltech.com).

Thank you and have a great day,



Alisha Glogowski, B.Sc.  
Environmental Scientist  
**ALL-TECH Environmental Services Ltd.**

<sup>1</sup> Millette, J.R. and S.M. Hays, Settled Asbestos Dust Sampling and Analysis, Lewis Publishers, London, 1994, pp: 49-51

**APPENDIX 1.0 – LABORATORY RESULTS**

CERTIFICATE OF ANALYSIS

Client: ALL-TECH Environmental Services Limited  
20 Duke St., Suite 109  
Bedford NS B4A 2Z5

Report Date: 12/7/2022  
Report No.: 673591 - TEM Dust  
Microvac  
Project: Bicentennial School  
Project No.: 30128

Client: ALL131

TEM DUST SAMPLE ANALYSIS SUMMARY

Lab No.: 7533054  
Client No.: T-01  
Asbestos Type(s):  
Chrysotile

Area (cm<sup>2</sup>): 10  
Location: Room 10-Desk

Density (s/mm<sup>2</sup>): 7.69  
Concentration (s/cm<sup>2</sup>): 3700

Lab No.: 7533055  
Client No.: T-02  
Asbestos Type(s):  
None Detected

Area (cm<sup>2</sup>): 10  
Location: Room 10-Chalkboard

Density (s/mm<sup>2</sup>): <7.69  
Concentration (s/cm<sup>2</sup>): <3700

Lab No.: 7533056  
Client No.: T-03  
Asbestos Type(s):  
Chrysotile

Area (cm<sup>2</sup>): 10  
Location: Room 9-Teachers Desk

Density (s/mm<sup>2</sup>): 250  
Concentration (s/cm<sup>2</sup>): 120000

Lab No.: 7533057  
Client No.: T-04  
Asbestos Type(s):  
Chrysotile

Area (cm<sup>2</sup>): 10  
Location: Room 9-Chalkboard


Density (s/mm<sup>2</sup>): 96.2  
Concentration (s/cm<sup>2</sup>): 46300


Lab No.: 7533058  
Client No.: T-05  
Asbestos Type(s):  
Chrysotile

Area (cm<sup>2</sup>): 10  
Location: Teachers Room-Center Desk

Density (s/mm<sup>2</sup>): 385  
Concentration (s/cm<sup>2</sup>): 185000

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/1/2022  
Date Analyzed: 12/07/2022  
Signature:   
Analyst: Craig Liska

Approved By:   
Frank E. Ehrenfeld, III  
Laboratory Director

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Client: ALL-TECH Environmental Services Limited  
20 Duke St., Suite 109  
Bedford NS B4A 2Z5

Report Date: 12/7/2022  
Report No.: 673591 - TEM Dust Microvac  
Project: Bicentennial School  
Project No.: 30128

Client: ALL131

## Appendix to Analytical Report:

**Customer Contact:**

**Analysis:** ASTM D5755-09

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

**iATL Customer Service:** customerservice@iatl.com

**iATL Office Manager:** wchampion@iatl.com

**iATL Account Representative:** Semih Kocahasan

**Sample Login Notes:** See Batch Sheet Attached

**Sample Matrix:** Cassettes

**Exceptions Noted:** See Following Pages

### General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at [www.iATL.com](http://www.iATL.com) and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

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This report shall not be reproduced except in full, without written approval of the laboratory.

### Information Pertinent to this Report:

Analysis by ASTM D5755-09

Please see our list of international, national, state, provincial, and local certifications at [www.iatl.com](http://www.iatl.com)

TEM settled dust results are dependent upon several factors, including sampling technique. iATL can supply references that may aid in the interpretation of results.

All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.

Method requires submittal of blanks for analysis. Sample results are not corrected for contamination by field or analytical blanks.

### Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a complete list with highlighted disclaimers pertinent to this project. For a full explanation of these and other disclaimers, please inquire at [customerservice@iatl.com](mailto:customerservice@iatl.com).

(1)Note: Sample not analyzed.

(2)Note: Sample not analyzed at request of client.

(3)Note: Sample analysis terminated. Clearance criteria exceeded (average  $>70.0 \text{ s/mm}^2$ ). Set fails by AHERA 40 CFR 763.

(4)Note: Heavy loading ( $>0.1 \text{ s/cc}$ ) of non-asbestos particulate that might prohibit the required morphological, diffraction and elemental identification of asbestos. The absence of asbestos on the sample can not be concluded. Analysis for informational purposes only.

(5)Note: Heavy loading ( $>10\%$  per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded ( $>10\%$ ). Sample voided by AHERA 40

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20 Duke St., Suite 109  
Bedford NS B4A 2Z5

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Project: Bicentennial School  
Project No.: 30128

Client: ALL131

- CFR 763.  
(5A)Note: Heavy loading (>25% per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded (>25%). Sample voided by NIOSH 7402.  
(6)Note: Sample turbidity >1.0 NTU. Therefore MDL >> 0.1 MFL. Does not meet National Primary Drinking Water Standards.  
(7)Note: Sample integrity compromised. Received sample cassette with top open (40 CFR 763 c-e).  
(8)Note: Received sample cassettes with portion of filter missing. "PCM re-prep"  
(9)Note: Void - overloaded, unable to prep.  
(10)Note: Void - filter damaged.  
(11)Note: No volume supplied.  
(12)Note: Heavy loading (>0.1 s/cc) of non-asbestos / non-fibrous particulate.  
(13)Note: Method analytical sensitivity of <0.003 s/cc not attained due to volume of air sampled. NIOSH requires a minimum of 400L.  
(13A)Note: Volume does not meet AHERA requirements. (<1188 L)  
(14)Note: Geometric Mean = 0.xxxx Structures/cc  
(15)Note: Samples received on 0.8 micron PCM filters. Samples must be submitted on 0.45 micron filter cassettes per AHERA guidelines  
(18)Note: \*Results are for informational purposes only. Samples received on 0.8um PCM cassettes. Per AHERA 40 CFR 763 guidelines samples must be obtained on a 0.45um cassette.


CERTIFICATE OF ANALYSIS


Client: ALL-TECH Environmental Services Limited 20 Duke St., Suite 109 Bedford NS B4A 2Z5	Report Date: 12/7/2022 Report No.: 673591 - TEM Dust Microvac Project: Bicentennial School Project No.: 30128
Client: ALL131	

TEM DUST SAMPLE ANALYSIS DETAILS

Lab No.: 7533054 Client No.: T-01  Volume Filtered (mL): 10 Dilution Factor (mL): 50 Grid Openings: 10 Opening Area (mm <sup>2</sup> ): 0.013 Area Analyzed (mm <sup>2</sup> ): 0.130 Sensitivity (s/mm <sup>2</sup> ): 7.69 Detection Limit (s/cm <sup>2</sup> ): 3700 Micrograph Number: EDXA Spectrum ID:	Area Sampled (cm <sup>2</sup> ): 10 Location: Room 10-Desk  Asbestos Structures: 1 Structures < 5 µm: None Detected Structures ≥ 5 µm: 1 Structure Density (s/mm <sup>2</sup> ): 7.69 Structure Concentration (s/cm <sup>2</sup> ): 3700 Asbestos Type(s): Chrysotile	Filter Type: MCE Filter Size (mm <sup>2</sup> ): 962 Pore Size (µm): 0.45 Non-Asbestos Structures: None Detected Structure Density (s/mm <sup>2</sup> ): <7.69 Structure Concentration (s/cm <sup>2</sup> ): <3700 Non-Asbestos Type(s): None Detected
Lab No.: 7533055 Client No.: T-02  Volume Filtered (mL): 10 Dilution Factor (mL): 50 Grid Openings: 10 Opening Area (mm <sup>2</sup> ): 0.013 Area Analyzed (mm <sup>2</sup> ): 0.130 Sensitivity (s/mm <sup>2</sup> ): 7.69 Detection Limit (s/cm <sup>2</sup> ): 3700 Micrograph Number: EDXA Spectrum ID:	Area Sampled (cm <sup>2</sup> ): 10 Location: Room 10-Chalkboard  Asbestos Structures: None Detected Structures < 5 µm: None Detected Structures ≥ 5 µm: None Detected Structure Density (s/mm <sup>2</sup> ): <7.69 Structure Concentration (s/cm <sup>2</sup> ): <3700 Asbestos Type(s): None Detected	Filter Type: MCE Filter Size (mm <sup>2</sup> ): 962 Pore Size (µm): 0.45 Non-Asbestos Structures: None Detected Structure Density (s/mm <sup>2</sup> ): <7.69 Structure Concentration (s/cm <sup>2</sup> ): <3700 Non-Asbestos Type(s): None Detected
Lab No.: 7533056 Client No.: T-03  Volume Filtered (mL): 10 Dilution Factor (mL): 50 Grid Openings: 4 Opening Area (mm <sup>2</sup> ): 0.013 Area Analyzed (mm <sup>2</sup> ): 0.0520 Sensitivity (s/mm <sup>2</sup> ): 19.2 Detection Limit (s/cm <sup>2</sup> ): 9250 Micrograph Number: EDXA Spectrum ID:	Area Sampled (cm <sup>2</sup> ): 10 Location: Room 9-Teachers Desk  Asbestos Structures: 13 Structures < 5 µm: 13 Structures ≥ 5 µm: None Detected Structure Density (s/mm <sup>2</sup> ): 250 Structure Concentration (s/cm <sup>2</sup> ): 120000 Asbestos Type(s): Chrysotile	Filter Type: MCE Filter Size (mm <sup>2</sup> ): 962 Pore Size (µm): 0.45 Non-Asbestos Structures: None Detected Structure Density (s/mm <sup>2</sup> ): <19.2 Structure Concentration (s/cm <sup>2</sup> ): <9250 Non-Asbestos Type(s): None Detected

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 12/1/2022  
Date Analyzed: 12/07/2022  
Signature:   
Analyst: Craig Liska

Approved By:   
Frank E. Ehrenfeld, III  
Laboratory Director

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Microvac  
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Project No.: 30128


Client: ALL131

TEM DUST SAMPLE ANALYSIS DETAILS

<b>Lab No.:</b> 7533057 <b>Client No.:</b> T-04  <b>Volume Filtered (mL):</b> 10 <b>Dilution Factor (mL):</b> 50 <b>Grid Openings:</b> 4 <b>Opening Area (mm<sup>2</sup>):</b> 0.013 <b>Area Analyzed (mm<sup>2</sup>):</b> 0.0520 <b>Sensitivity (s/mm<sup>2</sup>):</b> 19.2 <b>Detection Limit (s/cm<sup>2</sup>):</b> 9250 <b>Micrograph Number:</b> <b>EDXA Spectrum ID:</b>	<b>Area Sampled (cm<sup>2</sup>):</b> 10 <b>Location:</b> Room 9-Chaulkboard  <b>Asbestos Structures:</b> 5 <b>Structures &lt; 5 µm:</b> 4 <b>Structures ≥ 5 µm:</b> 1 <b>Structure Density (s/mm<sup>2</sup>):</b> <u>96.2</u> <b>Structure Concentration (s/cm<sup>2</sup>):</b> <u>46300</u> <b>Asbestos Type(s):</b> Chrysotile	<b>Filter Type:</b> MCE <b>Filter Size (mm<sup>2</sup>):</b> 962 <b>Pore Size (µm):</b> 0.45 <b>Non-Asbestos Structures:</b> None Detected <b>Structure Density (s/mm<sup>2</sup>):</b> <19.2 <b>Structure Concentration (s/cm<sup>2</sup>):</b> <9250 <b>Non-Asbestos Type(s):</b> None Detected
<b>Lab No.:</b> 7533058 <b>Client No.:</b> T-05  <b>Volume Filtered (mL):</b> 10 <b>Dilution Factor (mL):</b> 50 <b>Grid Openings:</b> 4 <b>Opening Area (mm<sup>2</sup>):</b> 0.013 <b>Area Analyzed (mm<sup>2</sup>):</b> 0.0520 <b>Sensitivity (s/mm<sup>2</sup>):</b> 19.2 <b>Detection Limit (s/cm<sup>2</sup>):</b> 9250 <b>Micrograph Number:</b> <b>EDXA Spectrum ID:</b>	<b>Area Sampled (cm<sup>2</sup>):</b> 10 <b>Location:</b> Teachers Room-Center Desk  <b>Asbestos Structures:</b> 20 <b>Structures &lt; 5 µm:</b> 20 <b>Structures ≥ 5 µm:</b> None Detected <b>Structure Density (s/mm<sup>2</sup>):</b> <u>385</u> <b>Structure Concentration (s/cm<sup>2</sup>):</b> <u>185000</u> <b>Asbestos Type(s):</b> Chrysotile	<b>Filter Type:</b> MCE <b>Filter Size (mm<sup>2</sup>):</b> 962 <b>Pore Size (µm):</b> 0.45 <b>Non-Asbestos Structures:</b> None Detected <b>Structure Density (s/mm<sup>2</sup>):</b> <19.2 <b>Structure Concentration (s/cm<sup>2</sup>):</b> <9250 <b>Non-Asbestos Type(s):</b> None Detected

Please refer to the Appendix of this report for further information regarding your analysis.

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