

## 2016 HAZARDOUS BUILDING MATERIAL ASSESSMENT REPORT

ST. MARY CATHOLIC SCHOOL

4 HAWTHORNE AVENUE IN CARLETON PLACE, ONTARIO



GEC PROJECT No. 29067

MARCH 2016

**REPORT TO:**

GARY ERRETT  
WESTERN REGION'S PLANT & MAINTENANCE SUPERVISOR

**ON:**

2016 HAZARDOUS BUILDING MATERIAL ASSESSMENT REPORT  
ST. MARY CATHOLIC SCHOOL  
4 HAWTHORNE AVENUE IN CARLETON PLACE, ONTARIO

**COMPLETED BY:**

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**REPORTED ON:**

March 31, 2016

## EXECUTIVE SUMMARY

Greenough Environmental Consulting Inc. (GEC) was commissioned by the Catholic District School Board of Eastern Ontario (CDSBEO) under the direction of Mr. Gary Errett, Plant & Maintenance Supervisor, to conduct a Hazardous Building Material Assessment (HBMA) report for the **St. Mary Catholic School** located at 4 Hawthorne Avenue in Carleton Place, Ontario.

The purpose of the investigation was to identify the quantity, location, and condition of designated substances and specified hazardous materials within the accessible areas of the school.

The site is owned by the CDSBEO and includes one school with three distinct phases (1958, 1967, and 1972). This report is being completed as part of the client's due diligence work to identify issues which need to be addressed as part of proposed renovation/demolition activities or may influence or change the procedure for the demolition or renovation activities. **GEC understands that a pending project is to include renovation work to replace the windows of the original building as outlined in the CDSBEO RFP No. PM-16-013.**

Based on the review of the noted reports, visual inspections of the accessible areas conducted during this survey and analytical results, non-friable asbestos-containing materials (ACMs) as well as lead have been confirmed within the proposed renovation areas. Silica and mercury are assumed present in select building materials based on historical application. Other designated substances may be present in low concentrations in building materials, paints and adhesives within the project areas but they do not represent a concern to occupational health at this time.

A summary of the HBMA is presented in **Table 1**.

<b>TABLE 1 - SUMMARY OF RESULTS &amp; RECOMMENDATIONS</b>		
<b>ST. MARY CATHOLIC SCHOOL – MARCH 2016</b>		
<b>Component</b>	<b>Comments</b>	<b>Recommendations</b>
Acrylonitrile	None identified.	None.
Arsenic	None identified.	None.
Asbestos	<b>General Findings:</b>  Based on the review of previously completed reports and the findings of this survey, the following <u>non-friable</u>	Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance

**TABLE 1 - SUMMARY OF RESULTS & RECOMMENDATIONS**  
**ST. MARY CATHOLIC SCHOOL – MARCH 2016**

Component	Comments	Recommendations
	<p>ACMs have been identified in the school:</p> <ul style="list-style-type: none"> <li>• Black Adhesive Pucks on Concrete Blocks;</li> <li>• Grey Exterior Window Caulking;</li> <li>• Plaster (1958 Phase);</li> <li>• Drywall Joint Compound (1958 and 1967 Phases);</li> <li>• Mortar Between Siporex (1958 Phase);</li> <li>• Acoustic Ceiling Tile; and</li> <li>• Vinyl Floor Tile.</li> </ul> <p>Based on the review of previously completed reports and the findings of this survey, the following <u>friable</u> ACMs have been identified in the school:</p> <ul style="list-style-type: none"> <li>• Vermiculite Insulation within exterior bricks (1958 Phase).</li> </ul> <p><b><u>Project Specific Findings:</u></b></p> <p>Based on the review of previously completed reports and the findings of this survey, the following <u>non-friable</u> ACMs have been identified in the project area:</p> <ul style="list-style-type: none"> <li>• Grey Exterior Window Caulking;</li> </ul> <p>Note: During a survey completed by Pinchin in 2006, a friable ACM (Vermiculite Insulation) was identified in the exterior bricks of the 1958 phase. According to CDSBEO staff,</p>	<p>with the requirements of Ontario Regulation 278/05.</p> <p>Sampling and analysis of exterior building materials, including roofing materials, is required prior to disturbance. Sampling is recommended prior to any project that may disturb exterior materials.</p> <p>That the roles and responsibility of “the owner” as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training.</p>

**TABLE 1 - SUMMARY OF RESULTS & RECOMMENDATIONS**  
**ST. MARY CATHOLIC SCHOOL – MARCH 2016**

Component	Comments	Recommendations
	this material is not expected to be disturbed during the upcoming renovation project. .	
Benzene	None identified.	None.
Coke Oven Emissions	None identified.	None.
Ethylene Oxides	None identified.	None.
Isocyanates	None identified.	None.
Lead	<p>GEC collected samples of paint finishes and also referenced previously completed sampling of painted finishes for the purpose of this report.</p> <p>A low to high amounts of lead were indentified in various painted finishes.</p> <p>Paint surfaces were generally found to be in good condition with minor random localized blistering or peeling observed.</p> <p>Based on historical applications lead is assumed to be present in solder on joints of copper piping, caulking in cast iron drainage pipe joints, electrical wiring/systems observed in the specified project locations.</p>	<p>The Lead Regulation on Construction Projects (enforced by Ministry of Labour) does not require removal of lead paint or lead-based materials unless work on these materials is likely to produce lead fumes or dust, for example, during welding, torch cutting, grinding, sanding, or sand blasting.</p> <p>In the event that any other work is conducted that has the potential to create airborne lead, every employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities to ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air. O.Reg 490/09.</p> <p>Disposal of lead-based paints considered to be hazardous waste (determined through toxicity characteristic leaching procedure) should be conducted in accordance with Ministry of Environment Regulation 558/00. Non-hazardous waste can be disposed of at permitted solid waste landfills.</p>
Mercury	Mercury and mercury vapour is	Mercury or mercury vapour within fluorescent

**TABLE 1 - SUMMARY OF RESULTS & RECOMMENDATIONS**  
**ST. MARY CATHOLIC SCHOOL – MARCH 2016**

Component	Comments	Recommendations
	<p>assumed to be present in fluorescent light tubes identified throughout the specified project areas.</p> <p>Although not identified, based on the age of the building, mercury is assumed to be present in thermostats, switches and thermometers within the specified project areas.</p> <p>Mercury may also be present in painted surfaces.</p>	<p>light tubes and other equipment poses no risk to occupants provided the mercury containers remain intact.</p> <p>Best management practice for disposal of mercury-containing light tubes is to participate in the manufacturer’s recycling program or to release the material to an approved waste carrier for disposal and/or recycling.</p>
Silica	<p>Silica is assumed to be present in non-fibreglass acoustic ceiling tiles, drywall, drywall joint compound, concrete materials, plaster finishes, concrete block and cement mortar observed within the specified project areas.</p> <p>The potential for the generation of airborne silica dust exists when manipulating the noted building materials.</p>	<p>Silica dust can be generated by drilling, coring, blasting, grinding, crushing and sandblasting silica-containing materials.</p> <p>Prior to any renovation or demolition, ensure that all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities are implemented to ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 milligrams per cubic metre of air by volume for cristobalite and tridymite, and 0.10 milligrams silica per cubic metre of air by volume for quartz and tripoli.</p>
Vinyl Chloride	Likely present in stable form in pipes, paints and finishes.	None.
Polychlorinated Biphenyls (PCBs)	<p>The inclusion of PCBs in new products was banned in 1980, but the use of existing PCB containing equipment is permitted.</p> <p>PCBs were widely used as coolants and insulating fluids (transformer oil)</p>	If PCB ballasts, equipment (electrical switches) or cable is discovered, they should be handled, stored and disposed of in accordance with the Federal Regulation SOR/92-507.

**TABLE 1 - SUMMARY OF RESULTS & RECOMMENDATIONS  
ST. MARY CATHOLIC SCHOOL – MARCH 2016**

Component	Comments	Recommendations
	<p>for transformers and capacitors, such as those used in old fluorescent light ballasts as well as other products.</p> <p>Ballasts within randomly selected light fixtures were fluorescent and were all labeled “non-PCB” containing.</p>	
Visible Mould	<p>Moulds cause biodegradation of natural materials that can be unwanted when it becomes food spoilage or damage to property. In large amounts they can be a health hazard to humans, potentially causing allergic reactions and respiratory problems.</p> <p>GEC completed a visual inspection for the presence of suspect mould growth in accessible areas of the building. Visible mould was not observed within the survey area.</p>	No recommendations warranted based on findings.

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## 1.0 INTRODUCTION

Greenough Environmental Consulting Inc. (GEC) was commissioned by the Catholic District School Board of Eastern Ontario (CDSBEO) under the direction of Mr. Gary Errett, Plant & Maintenance Supervisor, to conduct a Hazardous Building Material Assessment (HBMA) report for the **St. Mary Catholic School** located at 4 Hawthorne Avenue in Carleton Place, Ontario.

For the purpose of this survey, GEC reviewed previous reports completed for St. Mary Catholic School which included the following:

- "Asbestos Building Materials Report – 2006" – completed by Pinchin Environmental;
- "Project Specific DSR – Feb, 2016" – completed by GEC.

All DSR work meets the requirements of Section 30 of the Ontario Occupational Health and Safety Act and WHMIS Regulation (formerly Bill 208).

## 2.0 SCOPE AND METHODOLOGY

### 2.1 Scope

As required by the CDSBEO RFP No. PM-16-013, the purpose of the investigation was to identify the quantity, location, and condition of designated substances and specified hazardous materials within the accessible areas of the school interior. All work was completed in accordance with provincial regulations (O. Reg 490/09 and 278/05). The survey included the following designated substances:

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

The survey also included inspection for the following hazardous materials:

- PCB, and
- Visible Mould.

NOTE: GEC understands that the assessment for the above noted designated substances and hazardous materials will be used to prepare specifications, if required, that address the presence of above listed materials identified within the work areas, in order to ensure worker and occupant exposure is maintained within an acceptable level during pending renovations (Window Replacement).

## **2.2 Methodology**

Materials suspected to contain designated substances and hazardous materials were visually identified based on the surveyor's knowledge as well as historical application of building components. Where permitted, visual identification of materials suspected to contain asbestos was supported by the collection and analysis of representative samples as directed by the Client. Asbestos sampling was performed by GEC in order to meet the current minimum sampling requirements of Ontario Regulation 278/05 - Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05), as amended.

In Ontario, a material is defined as an ACM if the material has a minimum asbestos content of 0.5% by dry weight. ACMs are divided into two categories: friable and non-friable materials. A friable ACM is a material that can be crumbled, powdered, pulverized or reduced to dust by hand or moderate pressure. Friable materials can readily release fibres when disturbed. Common applications of friable ACMs are sprayed or trowelled surfacing materials (e.g. sprayed fireproofing and textured coatings) as well as mechanical and thermal insulations. Non-friable materials will generally release fibres only when cut, broken or have deteriorated to the point where the binding agents of the material begin to fail. Common non-friable ACMs include drywall joint compound, plaster, textile products (gaskets etc.) and asbestos cement (Transite). It must be noted that some materials, although non-friable intact, become friable upon manipulation (i.e. plaster, ceiling tile etc.).

Bulk samples of suspected ACMs collected by GEC during the site investigation were analyzed for asbestos content at Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario. The bulk asbestos samples were analyzed using a combination of dispersion staining and Polarised Light Microscopy (PLM). This analytical method complies with the United States Environmental Protection Agency (U.S. EPA) Method 600/R-93/116 dated July, 1993. Paracel is certified under

the National Institute of Science and Technology's National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos bulk sample analysis (NVLAP No. 200812-0). The laboratory utilizes a "positive-stop" analysis methodology and stopped analysis for the particular set of samples once asbestos concentrations at or above 0.5% is detected. Therefore, samples taken in order to satisfy the requirements of O. Reg. 278/05, were not analyzed if the previous sample was identified as asbestos-containing. **Appendix 2** presents asbestos analytical results obtained for the purpose of this survey.

For the purpose of this survey, GEC collected paint chip samples within the building and submitted the samples to Paracel Laboratories for analysis. Paracel has received its Certificate of Laboratory Proficiency from the Canadian Association of Environmental Analytical Laboratories (CAEAL) and has achieved accreditation from the Standard Council of Canada.

Analysis of paint chip samples is performed using MOE E3470 (which utilizes EPA Method 6020) which describes the multi-elemental determination of analyses by ICP-OES in environmental samples. **Appendix 3** presents the lead analytical results obtained for the purpose of this survey.

### **3.0 SURVEY LIMITATIONS**

This report reflects the observations of the accessed areas and analysis of materials sampled during the current survey as well as reference to previous bulk sampling results of visually similar materials. It is possible that additional designated substances and hazardous materials exist outside the survey area but they are beyond the scope of this survey.

Sampling of roofing materials was limited due to snow cover. Due to the potential for compromising the building envelope, GEC did not perform destructive sampling of roofing materials. Any materials located on the roof not noted in this report should be sampled according to O.Reg 278/05 prior to manipulation.

GEC cannot warrant against the discovery of additional ACMs or presence of other designated substances inside wall cavities, closed bulkheads and closed ceilings due to the non-destructive nature of this survey.

The site investigation was completed by Mike Mask of GEC on the evening of March 9, 2016. Observations expressed in this document apply only to conditions on this date and within the subject areas.

## 4.0 RESULTS

The results of the designated substances survey are discussed below.

### 4.1 Acrylonitrile

Acrylonitrile is used in production of synthetics and may be present in stable form in paints and adhesives. Over time, acrylonitrile will volatilize out of these materials but it is not expected that acrylonitrile concentrations will exceed the maximum allowable Time Weighted Average Exposure Value (TWAEV) of  $4.3 \text{ mg/m}^3$  of air for occupants of the subject area.

### 4.2 Arsenic

Arsenic, or arsenic-containing compounds, may be present in stable form in paints and adhesives. Provided these materials remain in good condition, it is not expected that arsenic concentrations will exceed the maximum allowable TWAEV of  $0.1 \text{ mg/m}^3$  of air for occupants of the subject area.

### 4.3 Asbestos

**Appendix 1** presents a room by room summary of the findings relating to asbestos.

For the purpose of this survey, GEC reviewed the previously completed surveys and collected suspect materials not previously sampled in accordance with bulk asbestos sampling protocols and procedures provided in O. Reg. 278/05.

GEC identified ten (10) visually distinct building materials that may contain asbestos that were not previously tested or required additional sampling to meet the requirements of O. Reg. 278/05. In total, thirty-nine (39) representative samples of these suspect building materials were collected and submitted for laboratory analysis of asbestos content. The number of bulk samples for each type of material was determined by the requirements provided in Table 1 of O. Reg. 278 (Number of Bulk Samples Required).

**Table 2** provides a summary of all previous bulk sampling completed by others.

**TABLE 2 – ST. MARY – HBMA – COMPLETED BY OTHERS  
ASBESTOS ANALYTICAL RESULTS**

<b>Sample Reference</b>	<b>Building Material Description</b>	<b>Location of Sample(s)</b>	<b>Result &amp; Type</b>
<b>Sampling By Pinchin 2006</b>			
2006	2' x 4' lay-in ceiling tile, widthwise fissures and random large pinholes	Room 103	ND
2006	2' x 4' lay-in ceiling tile, large random fissures and pinholes	1967 Corridor	ND
2006	2' x 4' lay-in ceiling tile, small random fissures and pinholes	1967 Corridor	ND
<b>2006</b>	<b>2' x 4' lay-in ceiling tile, large long lengthwise fissures and small pinholes</b>	<b>Room 116</b>	<b>0.5-5% CH 0.5-5% AM</b>
<b>2006</b>	<b>Vermiculite</b>	<b>Within Brick (1958 Phase)</b>	<b>Confirmed ACM</b>
<b>2006</b>	<b>Plaster</b>	<b>Throughout 1958 Phase</b>	<b>0.5-5% CH</b>
<b>2006</b>	<b>Drywall Joint Compound</b>	<b>1958 Phase</b>	<b>0.5-5% CH</b>
<b>2006</b>	<b>Drywall Joint Compound</b>	<b>1967 Phase</b>	<b>0.5-5% CH</b>
2006	Drywall Joint Compound	1972 Phase	ND
2006	12" x 12' vinyl floor tile, beige with grey smears	Room 103	ND
<b>2006</b>	<b>12" x 12' vinyl floor tile, brown with white and brown streaks</b>	<b>Room 202</b>	<b>0.5-5% CH</b>
2006	12" x 12' vinyl floor tile, beige with brown smears	Room 212	ND
<b>2006</b>	<b>Mortar Between Siporex</b>	<b>1958 Phase</b>	<b>0.5-5% CH</b>
<b>Sampling By GEC Feb 2016</b>			
2016	Brick Mortar	Building Exterior (Project Area)	ND
<b>2016</b>	<b>Grey Exterior Caulking on Windows and Flashing</b>	<b>Building Exterior (Project Area)</b>	<b>14.06% CH</b>
2016	White Exterior Caulking on Windows	Building Exterior (Project Area)	ND
2016	Red Adhesive on Styrofoam within Window Sill (Beneath Windows)	Building Exterior (Project Area)	ND

- **ND = No Asbestos Detected**
- **AM = Amosite Asbestos, CH = Chrysotile Asbestos**
- **\* Definition of an "Asbestos-containing material" as defined by the Ontario Ministry of Labour Regulation 278/05 is any material found to contain 0.5% or greater asbestos by dry weight.**

**Table 3** provides a summary of bulk sampling completed by GEC for the purposes of this survey.

<b>TABLE 3 – ST. MARY – HBMA – COMPLETED GEC MARCH 2016</b>			
<b>ASBESTOS ANALYTICAL RESULTS</b>			
<b>Sample Reference</b>	<b>Building Material Description</b>	<b>Location of Sample(s)</b>	<b>Result &amp; Type</b>
(3 samples) SA-01a – 01c	Grey Interior Caulking	Throughout	ND
(3 samples) SA-02a – 02c	White Interior Caulking	Throughout	ND
(3 samples) SA-03a – 03c	Black Tar on Beams	Room 107	ND
(3 samples) SA-04a – 04c	Vinyl Floor Tile – 30cm x 30cm – White with Blue Flecks	Room 107	ND
	Associated Mastic		ND
	Associated Levelling Compound		ND
(3 samples) SA-05a – SA-05c	Vinyl Floor Tile – 30cm x 30cm – White with Black and Blue Flecks	Room 204	ND
	Associated Mastic		ND
(3 samples) SA-06a – SA-06c	Adhesive Associated with Blue Vinyl Baseboard	Throughout	ND
(3 samples) SA-07a – 07c	Adhesive Associated with Black Vinyl Baseboard	Room 121	ND
<b>(3 samples) SA-08a – SA-08c</b>	<b>Black Adhesive Pucks on Concrete Block</b>	<b>Above Dropped Ceiling Throughout</b>	<b>0.59% CH</b>
(3 samples) SA-09a – SA-09c	Rough Plaster Finish	Electrical Room	ND
(3 samples) SA-10a – 10c	Vinyl Floor Tile – 30cm x 30cm – Off White with Grey Streaks	Gym Storage	ND

- **ND = No Asbestos Detected, CH = Chrysotile Asbestos, AM = Amosite Asbestos**
- **\* Definition of an "Asbestos-containing material" as defined by the Ontario Ministry of Labour Regulation 278/05 is any material found to contain 0.5% or greater asbestos by dry weight.**

The detailed description of materials surveyed, including location, type, quantity, and condition, as well as samples collected and the analytical data are provided in **Appendix 1**. The analytical laboratory report is provided in **Appendix 2** and photo references in **Appendix 4**.

A summary of the asbestos findings are presented below:

Friable asbestos containing: Friable asbestos containing are materials that can be crumbled, pulverized or powdered by hand pressures, and so could release airborne asbestos fibres to the environment with minimal disturbance. Based on laboratory analysis and **GEC's** observations during the site inspections:

- Vermiculite Insulation:
  - This material was observed as loose-fill insulation within exterior bricks of the 1958 phase of construction. Due to the non-destructive nature of this survey, accurate quantities could not be determined.

Non-Friable asbestos containing: Non-Friable asbestos containing product is one in which asbestos fibres are bound or locked in to the product matrix, and so will require significant disturbance to release airborne asbestos fibres. Based on laboratory analysis and GEC's observations during the site inspections, the following materials were identified as non-friable asbestos:

- Black Adhesive Pucks on Concrete Blocks:
  - This material was observed sporadically throughout the school, above ceiling grids, attached to concrete blocks. Due to limited access/obstructions within ceiling space, accurate quantities could not be determined. Any adhesive pucks on concrete blocks within the building should be treated as an ACM. Photos of this material can be found in **Appendix 4**.
- Grey Exterior Window Caulking;
  - This material was observed on windows and flashing on the exterior of the building (project area). Photos of this material can be found in **Appendix 4**.
- Plaster (1958 Phase);
  - Although most of this material seems to have been removed during a previous project, remnant plaster remains on brick and concrete block above ceiling grids throughout the 1958 phase of the building.
    - Plaster is considered a non-friable material, however it is considered friable upon manipulation. Photos of this material can be found in **Appendix 4**.
- Drywall Joint Compound (1958 and 1967 Phases);
  - This material was observed throughout all phases of the building. Due to previous laboratory data, all drywall within both the 1958 and 1967 phases of the building should be treated as ACM.
- Mortar Between Siporex (1958 Phase);

- Approximately 40m<sup>2</sup> of this material was observed throughout the 1958 phase of the building. All Mortar between Siporex should be treated as ACM. Photos of this material can be found in **Appendix 4**.
- Acoustic Ceiling Tile – Long Large Lengthwise Fissures and Small Pinholes;
  - Approximately 31 m<sup>2</sup> of this material was observed throughout the building. Photos of this material can be found in **Appendix 4**.
    - *Ground Floor*
      - Gym Storage Room – 25 m<sup>2</sup>
      - Back Entrance Vestibule – 5 m<sup>2</sup>
    - *2<sup>nd</sup> Floor*
      - Corridor (adjacent Room 212) – 1 m<sup>2</sup>
- Vinyl Floor Tile – 30cm x 30cm – Brown with White and Brown Streaks
  - Approximately 130 m<sup>2</sup> of this material was observed throughout the building. Photos of this material can be found in **Appendix 4**.
    - *2<sup>nd</sup> Floor*
      - Room 202 – 65 m<sup>2</sup>
      - Room 203 – 65 m<sup>2</sup>

Note: Asbestos rope caulking is suspected in cast iron fittings.

#### 4.4 Benzene

Benzene is likely present in a stable form within roofing materials, paints and adhesives. Over time, the benzene component volatilizes out of these materials and is released into the ambient air. It is expected that only trace amounts of benzene presently exist in the building materials at the site. It is unlikely that benzene emissions from the building materials on site will exceed the maximum allowable TWAEV of 0.5ppm (parts per million) for occupants of the subject area.

#### 4.5 Coke Oven Emissions

Coke oven emissions are the exhaust released during the burning process of coke (pure carbon). This process was not observed and is not expected to take place within this building; therefore, it is unlikely that coke oven emission concentrations will exceed the maximum allowable TWAEV of 0.15 mg/m<sup>3</sup> for occupants for the subject area.



#### 4.6 Ethylene Oxides

Ethylene oxides are used in production of many foams, adhesives and paints. Over time, ethylene oxide will volatilize out of these materials and may be present in trace amounts in the ambient air in the area. It is not expected that ethylene oxide levels will become hazardous to occupants of the subject area.

#### 4.7 Isocyanates

Isocyanates are raw materials from which all polyurethane products are made. Over time, isocyanates may volatilize out of these materials but will only be present in trace amounts and are not expected to exceed the maximum allowable TWAEV of 0.005ppm for occupants of the subject area.

#### 4.8 Lead

In 1976, the Hazardous Products Act limited the amount of lead in interior paint to 0.5 % by weight (5,000 µg/g). Over the years, the amount of lead in paint has continued to decrease due to cooperative efforts of government and industry.

GEC conducted sampling of suspect paints and referenced previously completed sampling of painted finishes for the purpose of this report.

Based on the previous laboratory analysis of visually similar paint finishes, lead concentrations ranged from less than the method detection limit (< 20 µg/g) to high (8,940 µg/g) in the predominant paint finishes within the proposed renovation areas.

Previous lead analysis as it relates to this project is summarized in **Table 4**.

<b>TABLE 4 – ST. MARY – HBMA – COMPLETED BY GEC FEB 2016</b>			
<b>LEAD ANALYTICAL RESULTS</b>			
<b>Sample Reference</b>	<b>Location</b>	<b>Colour</b>	<b>Result (µg/g)</b>
2016	Exterior Metal	Yellow/Beige	8,940
2016	Exterior Window Sill	White	135

**Table 5** provides a summary of bulk sampling completed by GEC for the purposes of this survey.

<b>TABLE 5 – ST. MARY – HBMA – COMPLETED GEC MARCH 2016</b>			
<b>LEAD ANALYTICAL RESULTS</b>			
<b>Sample Reference</b>	<b>Location</b>	<b>Colour</b>	<b>Result (µg/g)</b>
LS-01	Electrical Room – Floor Paint	Grey	160
LS-02	Door Frame	Blue	< 20
LS-03	Gymnasium Wall	Light Blue	183
LS-04	Education Assistant Room Wall	Off White	< 20
LS-05	Stage Paint	Black	< 20

Paint surfaces were generally found to be in good condition with minor random localized blistering or peeling observed.

Additionally; based on historical applications lead is presumed to be present in solder on joints of copper piping, caulking in cast iron drainage pipe joints, electrical wiring/systems observed in the specified project locations.

#### **4.9 Mercury**

Mercury and mercury vapour is assumed to be present in fluorescent light tubes identified throughout the project areas.

Based on the age of the buildings mercury is assumed to be present in thermostats, switches and thermometers within the project areas.

Sampling of mercury in painted surfaces was not performed. Mercury is assumed be present in painted surfaces.

#### **4.10 Silica**

Silica is assumed to be present in non-fibreglass acoustic ceiling tiles, drywall, drywall joint compound, concrete materials, plaster finishes, concrete block and cement mortar observed within the specified project areas.

The potential for the generation of airborne silica dust exists when manipulating the noted building materials.

#### **4.11 Vinyl Chloride**

Vinyl chloride may be present in paints and finishes. Over time, vinyl chloride will volatilize out of these materials but will only be present in trace amounts and is not expected to exceed the maximum allowable TWAEV of 1ppm (parts per million) for occupants of the subject area.

#### **4.12 Polychlorinated Biphenyls (PCBs)**

Fluorescent lighting was observed throughout the building. Random inspections of fluorescent light ballasts in the subject area were conducted during the assessment. None of the ballasts inspected are known to contain PCBs.

#### **4.13 Visible Mould**

No visible mould was identified in accessible areas of the school.

### **5.0 RECOMMENDATIONS**

#### **5.1 Asbestos**

The following recommendations are made respecting Ontario Regulation 278/05:

##### Project Specific Recommendations – Replacement of Windows in the original building:

- All grey exterior caulking found on windows and flashing should be removed following Type-1 procedures as outlined O.Reg 278/05.
  - Please see attached Type-1 Specification for the upcoming project (**Appendix 5**).
  - Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05.

### General Recommendations:

- Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05.
- That the roles and responsibility of “the owner” as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training.

## **5.2 Lead**

The Lead Regulation on Construction Projects (enforced by the Ministry of Labour) does not require removal of lead-based materials unless work on these materials is likely to produce lead fumes or dust; for example, during welding, torch cutting, grinding, sanding or sandblasting.

In the event that such work is conducted at this facility, every employer shall take all necessary measures and procedures by means of engineering controls, work and hygiene practices to ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air, Ontario regulation 490/09.

The Occupational Health and Safety Branch of the Ontario Ministry of Labour have published *Guideline: Lead on Construction Projects*. This document classifies all lead disturbances as Type 1, Type 2a, Type 2b or Type 3 work, and assigns alternate levels of respiratory protection and work procedures for each type of task being performed.

Lead has been confirmed and/or assumed to be present in the following materials:

- Paint (confirmed);
- Solder on the joints of copper pipes (assumed);
- Cast iron pipe joint caulking (visually identified); and
- Electrical wiring / equipment etc (assumed).

When piping is removed during demolition activities, copper and drainage piping can be cut a small distance (e.g., 5cm) from the joints to avoid disturbance of the solder and joint caulking suspected to contain lead.

The work procedures outlined in the MOL document entitled *Guideline: Lead on Construction Projects* must be followed when disturbing the mentioned lead-containing materials.

The OEL for airborne lead is prescribed by Ontario Regulation 490/09 *Designated Substances*, as amended. Work procedures and personal protective equipment must be used to ensure that workers are not exposed to airborne lead levels that exceed this Occupational Exposure Limit.

The disposal of construction waste containing lead is governed by O. Reg. 558/00- General – Waste Management, as amended. The transport of the waste to the disposal site is controlled by the Federal Transportation of Dangerous Goods Act (TDGA), 1992.

### **5.3 Mercury**

Mercury or mercury vapour within fluorescent light tubes and other equipment (i.e. thermometers and thermostats) poses no risk to occupants provided the mercury containers remain intact.

It is unlikely that the presence of mercury in equipment will lead to unintended ingestion, inhalation or absorption of mercury, provided equipment remains in good working condition. All work must be conducted on mercury-containing equipment so that mercury does not exceed the maximum allowable TWAEV of 0.01 mg/m<sup>3</sup> of air as outlined in O. Reg. 490/09.

Best management practice for disposal of mercury-containing light tubes, equipment and chemical waste is to participate in the product manufacturer's recycling program or to release the material to an approved waste carrier for disposal and/or recycling.

### **5.4 Silica**

Silica dust can be generated by drilling, coring, blasting, grinding, crushing and sandblasting silica-containing materials. Work on potential silica-containing building material must adhere to the following precautions:

- Segregate the work area from the rest of the building to reduce the risk of exposing building occupants to silica dust. Workers leaving the work area should pass through a designated clean room where excess dust can be brushed off clothes and facilities are available to wash dust off skin.
- The work surface should be wetted regularly to limit dust released during striking and abrasion.

- Everyone in the work area should be provided with a half-face respirator equipped with HEPA filters.
- Ensure that all necessary measures and procedures by means of engineering control, work and hygiene practices are implemented to ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 mg/m<sup>3</sup> of air for cristobalite and tridymite, and 0.10 mg/ m<sup>3</sup> of air for quartz and tripoli.

## **6.0 CLOSURE**

This report has been prepared for the sole benefit of the Client and their intended use. The report may not be relied upon by any other person or entity without the written consent of Greenough Environmental Consulting Inc. (GEC), and the Client.

GEC accepts no responsibility for any use that an outside party makes of this report and any reliance on decisions made based on it, are the responsibility of such parties.

This report was not intended to provide direction or procedures for the handling of designated substances and hazardous materials. Only persons with documented, current training in the safe handling of the designated substances and hazardous materials should handle them. Persons handling any of the designated substances and/or hazardous materials identified in this survey, or conducting work in the vicinity of these materials are advised to consult this survey and individuals with appropriate experience and training, prior to doing so.

The conclusions presented represent the best judgment of the assessor based on current environmental standards. Due to the nature of the investigation and the limited data available, the assessor cannot warrant against undiscovered environmental liabilities.

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

Yours Truly,

**GREENOUGH ENVIRONMENTAL CONSULTING INC.**



Mike Mask  
Environmental Technician



Michael P. Buller, B.A. (Hons), ROHT, CRSP, CMI  
Vice President

**APPENDIX 1**

**ACM TABLE**



2016 HBMA  
ST. MARY CATHOLIC SCHOOL - CARLETON PLACE, ONTARIO

**2016 Hazardous Building Materials Assessment - St. Mary Catholic School - 4 Hawthorne Avenue, Carleton Place, Ontario**

**1958 Phase**

**Please note:** Remnant asbestos containing plaster (Pinchin 2006) was identified throughout the 1958 phase above the ceiling grid. It is possible that asbestos-containing plaster could be concealed within enclosed locations throughout the 1958 phase. All homogeneous plaster (or remnant plaster) must be treated as an asbestos-containing material.

**Please note:** Asbestos-Containing Drywall Joint Compound was identified throughout the 1958 phase (Pinchin 2006). All drywall joint compound within the 1958 phase should be treated as an asbestos-containing material.

**Please note:** Asbestos-Containing Mortar was identified throughout the 1958 phase between Siporex roof slabs (Pinchin 2006). All mortar between Siporex deck slabs within the 1958 phase should be treated as an asbestos-containing material.

**Please note:** Asbestos-Containing Vermiculite Insulation was identified throughout the 1958 phase within exterior brick (Pinchin 2006). It is possible that asbestos-containing Vermiculite insulation could be concealed within enclosed locations throughout the 1958 phase. All Vermiculite insulation within the 1958 phase should be treated as an asbestos-containing material.

**GROUND FLOOR**

LOCATION	COMPONENT	MATERIAL	CONDITION/QUANTITY			UNIT	SAMPLE	FRIABLE	COMMENTS
			GOOD	FAIR	POOR		REFERENCE	(Y/N)	
Corridor	Wall	Black Adhesive pucks	X				GEC-08a	N	Identified sporadically throughout the 1958 phase above ceiling grid on concrete block.
Exterior	Windows	Grey Exterior Caulking	X				GEC 2016	N	Identified around windows and flashing on exterior of building.

2016 HBMA  
ST. MARY CATHOLIC SCHOOL - CARLETON PLACE, ONTARIO

## 1967 Phase

**Please note:** Asbestos-Containing Drywall Joint Compound was identified throughout the 1967 phase (Pinchin 2006). All drywall joint compound within the 1967 phase should be treated as an asbestos-containing material.

### GROUND FLOOR

LOCATION	COMPONENT	MATERIAL	CONDITION/QUANTITY			UNIT	SAMPLE	FRIABLE	COMMENTS
			GOOD	FAIR	POOR		REFERENCE	(Y/N)	
Corridor	Wall	Black Adhesive pucks	X				GEC-08a	N	Identified sporadically throughout the 1967 phase above ceiling grid on concrete block.
Gymnasium Storage (Room 128)	Ceiling	Acoustic Ceiling Tile - 2' x 4' - Large Long Lengthwise Fissure and Small Pinholes	25			m <sup>2</sup>	Pinchin 2006	N	
Back Entrance Vestibule	Ceiling	Acoustic Ceiling Tile - 2' x 4' - Large Long Lengthwise Fissure and Small Pinholes	5			m <sup>2</sup>	Pinchin 2006	N	

**2016 HBMA  
ST. MARY CATHOLIC SCHOOL - CARLETON PLACE, ONTARIO**

**1972 Phase**

**2nd FLOOR**

LOCATION	COMPONENT	MATERIAL	CONDITION/QUANTITY			UNIT	SAMPLE	FRIABLE	COMMENTS
			GOOD	FAIR	POOR		REFERENCE	(Y/N)	
Corridor	Wall	Black Adhesive pucks	X				GEC-08a	N	Identified sporadically throughout the 1967 phase above ceiling grid on concrete block.
	Ceiling	Acoustic Ceiling Tile - 2' x 4' - Large Long Lengthwise Fissure and Small Pinholes	1			m <sup>2</sup>	Pinchin 2006	N	One ceiling tile was observed in the corridor adjacent to room 212.
Classroom 202	Floor	12" x 12' Vinyl Floor Tile - Brown with White and Brown Streaks	65			m <sup>2</sup>	Pinchin 2006	N	
Classroom 203	Floor	12" x 12' Vinyl Floor Tile - Brown with White and Brown Streaks	65			m <sup>2</sup>	Pinchin 2006	N	

**APPENDIX 2**

**ANALYTICAL RESULTS – ASBESTOS LABORATORY CERTIFICATE  
SAMPLING MARCH 2016**

## Certificate of Analysis

**Greenough Environmental Consulting Inc.**

29 Capital Drive  
Ottawa, ON K2C 0E7  
Attn: Derek Stashick

Client PO:  
Project: 29067  
Custody:

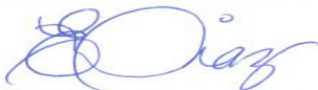
Report Date: 22-Mar-2016  
Order Date: 16-Mar-2016

**Order #: 1612214**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID	Parcel ID	Client ID
1612214-01	SA-01A	1612214-27	SA-06C (Adhesive Only)
1612214-02	SA-01B	1612214-28	SA-07A (Adhesive Only)
1612214-03	SA-01C	1612214-29	SA-07B (Adhesive Only)
1612214-04	SA-02A	1612214-30	SA-07C (Adhesive Only)
1612214-05	SA-02B	1612214-31	SA-08A
1612214-06	SA-02C	1612214-32	SA-08B
1612214-07	SA-03A	1612214-33	SA-08C
1612214-08	SA-03B	1612214-34	SA-09A
1612214-09	SA-03C	1612214-35	SA-09B
1612214-10	SA-04A (Tile)	1612214-36	SA-09C
1612214-11	SA-04B (Tile)	1612214-37	SA-10A
1612214-12	SA-04C (Tile)	1612214-38	SA-10B
1612214-13	SA-04A (Mastic)	1612214-39	SA-10C
1612214-14	SA-04B (Mastic)		
1612214-15	SA-04C (Mastic)		
1612214-16	SA-04A (Levelling Compound)		
1612214-17	SA-04B (Levelling Compound)		
1612214-18	SA-04C (Levelling Compound)		
1612214-19	SA-05A (Tile)		
1612214-20	SA-05B (Tile)		
1612214-21	SA-05C (Tile)		
1612214-22	SA-05A (Mastic)		
1612214-23	SA-05B (Mastic)		
1612214-24	SA-05C (Mastic)		
1612214-25	SA-06A (Adhesive Only)		
1612214-26	SA-06B (Adhesive Only)		

Approved By:



Emma Diaz  
Senior Analyst

**Certificate of Analysis**

 Client: **Greenough Environmental Consulting Inc.**

Report Date: 22-Mar-2016

Order Date: 16-Mar-2016

**Client PO:**
**Project Description: 29067**
**Asbestos, PLM Visual Estimation \*\*MDL - 0.5%\*\***

<i>Parcel I.D.</i>	<i>Sample Date</i>	<i>Layers Analyzed</i>	<i>Colour</i>	<i>Description</i>	<i>Asbestos Detected:</i>	<i>Material Identification</i>	<i>% Content</i>
1612214-01	14-Mar-16	sample homogenized	Grey	Caulk	No	Client ID: SA-01A [AS-PRE] Non-Fibers	100
1612214-02	14-Mar-16	sample homogenized	Grey	Caulk	No	Client ID: SA-01B [AS-PRE] Non-Fibers	100
1612214-03	14-Mar-16	sample homogenized	Grey	Caulk	No	Client ID: SA-01C [AS-PRE] Non-Fibers	100
1612214-04	14-Mar-16	sample homogenized	White	Caulk	No	Client ID: SA-02A [AS-PRE] Non-Fibers	100
1612214-05	14-Mar-16	sample homogenized	White	Caulk	No	Client ID: SA-02B [AS-PRE] Non-Fibers	100
1612214-06	14-Mar-16	sample homogenized	White	Caulk	No	Client ID: SA-02C [AS-PRE] Non-Fibers	100
1612214-07	14-Mar-16	sample homogenized	Black	Tar	No	Client ID: SA-03A [AS-PRE] Non-Fibers	100
1612214-08	14-Mar-16	sample homogenized	Black	Tar	No	Client ID: SA-03B [AS-PRE] Non-Fibers	100
1612214-09	14-Mar-16	sample homogenized	Black	Tar	No	Client ID: SA-03C [AS-PRE] Non-Fibers	100
1612214-10	14-Mar-16	sample homogenized	White	Floor Tile	No	Client ID: SA-04A (Tile) [AS-PRE] Non-Fibers	100
1612214-11	14-Mar-16	sample homogenized	White	Floor Tile	No	Client ID: SA-04B (Tile) [AS-PRE] Non-Fibers	100
1612214-12	14-Mar-16	sample homogenized	White	Floor Tile	No	Client ID: SA-04C (Tile) [AS-PRE] Non-Fibers	100
1612214-13	14-Mar-16	sample homogenized	Yellow	Mastic	No	Client ID: SA-04A (Mastic) [AS-PRE] Non-Fibers	100
1612214-14	14-Mar-16	sample homogenized	Yellow	Mastic	No	Client ID: SA-04B (Mastic) [AS-PRE] Non-Fibers	100
1612214-15	14-Mar-16	sample homogenized	Yellow	Mastic	No	Client ID: SA-04C (Mastic) [AS-PRE] Non-Fibers	100
1612214-16	14-Mar-16	sample homogenized	Grey/Black	Leveling Compound/Mastic	No	Client ID: SA-04A (Levelling Compound) [AS-PRE, Z-01a] Non-Fibers	100
1612214-17	14-Mar-16	sample homogenized	Grey/Black	Leveling Compound/Mastic	No	Client ID: SA-04B (Levelling Compound) [AS-PRE, Z-01a] Non-Fibers	100

**Certificate of Analysis**

 Client: **Greenough Environmental Consulting Inc.**

Report Date: 22-Mar-2016

Order Date: 16-Mar-2016

**Client PO:**
**Project Description: 29067**
**Asbestos, PLM Visual Estimation    \*\*MDL - 0.5%\*\***

<i>Paracel I.D.</i>	<i>Sample Date</i>	<i>Layers Analyzed</i>	<i>Colour</i>	<i>Description</i>	<i>Asbestos Detected:</i>	<i>Material Identification</i>	<i>% Content</i>
1612214-18	14-Mar-16	sample homogenized	Grey/Black	Leveling Compound/Mastic	No	<b>Client ID: SA-04C (Levelling Compound)</b> [AS-PRE, Z-01a] Non-Fibers	100
1612214-19	14-Mar-16	sample homogenized	White	Floor Tile	No	<b>Client ID: SA-05A (Tile)</b> [AS-PRE] Non-Fibers	100
1612214-20	14-Mar-16	sample homogenized	White	Floor Tile	No	<b>Client ID: SA-05B (Tile)</b> [AS-PRE] Non-Fibers	100
1612214-21	14-Mar-16	sample homogenized	White	Floor Tile	No	<b>Client ID: SA-05C (Tile)</b> [AS-PRE] Non-Fibers	100
1612214-22	14-Mar-16	sample homogenized	Yellow	Mastic	No	<b>Client ID: SA-05A (Mastic)</b> [AS-PRE] Non-Fibers	100
1612214-23	14-Mar-16					<b>Client ID: SA-05B (Mastic)</b> [Z-01] not analyzed	
1612214-24	14-Mar-16	sample homogenized	Yellow	Mastic	No	<b>Client ID: SA-05C (Mastic)</b> [AS-PRE] Non-Fibers	100
1612214-25	14-Mar-16	sample homogenized	Brown	Adhesive	No	<b>Client ID: SA-06A (Adhesive Only)</b> [AS-PRE] Non-Fibers	100
1612214-26	14-Mar-16	sample homogenized	Brown	Adhesive	No	<b>Client ID: SA-06B (Adhesive Only)</b> [AS-PRE] Non-Fibers	100
1612214-27	14-Mar-16	sample homogenized	Brown	Adhesive	No	<b>Client ID: SA-06C (Adhesive Only)</b> [AS-PRE] Non-Fibers	100
1612214-28	14-Mar-16	sample homogenized	Brown	Adhesive	No	<b>Client ID: SA-07A (Adhesive Only)</b> [AS-PRE] Non-Fibers	100
1612214-29	14-Mar-16	sample homogenized	Brown	Adhesive	No	<b>Client ID: SA-07B (Adhesive Only)</b> [AS-PRE] Non-Fibers	100
1612214-30	14-Mar-16	sample homogenized	Brown	Adhesive	No	<b>Client ID: SA-07C (Adhesive Only)</b> [AS-PRE] Non-Fibers	100
1612214-31	14-Mar-16	sample homogenized	Black	Tar	Yes	<b>Client ID: SA-08A</b> [AS-PRE] <b>Chrysotile</b> Non-Fibers	0.59 99.41
1612214-32	14-Mar-16					<b>Client ID: SA-08B</b> not analyzed	
1612214-33	14-Mar-16					<b>Client ID: SA-08C</b> not analyzed	
1612214-34	14-Mar-16	sample homogenized	Grey	Mortar	No	<b>Client ID: SA-09A</b> Non-Fibers	100

Certificate of Analysis

Client: **Greenough Environmental Consulting Inc.**

Report Date: 22-Mar-2016

Order Date: 16-Mar-2016

Client PO:

**Project Description: 29067**

**Asbestos, PLM Visual Estimation    \*\*MDL - 0.5%\*\***

Parcel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1612214-35	14-Mar-16	sample homogenized	Grey	Mortar	No	<b>Client ID: SA-09B</b> Non-Fibers	100
1612214-36	14-Mar-16	sample homogenized	Grey	Mortar	No	<b>Client ID: SA-09C</b> Non-Fibers	100
1612214-37	14-Mar-16	sample homogenized	Grey	Floor Tile	No	<b>Client ID: SA-10A</b> [AS-PRE] Non-Fibers	100
1612214-38	14-Mar-16	sample homogenized	Grey	Floor Tile	No	<b>Client ID: SA-10B</b> [AS-PRE] Non-Fibers	100
1612214-39	14-Mar-16	sample homogenized	Grey	Floor Tile	No	<b>Client ID: SA-10C</b> [AS-PRE] Non-Fibers	100

**\*\* Analytes in bold indicate asbestos mineral content.**

**Analysis Summary Table**

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	Ottawa West Lab	200812-0	16-Mar-16

\* Reference to the NVLAP term does not permit the user of this report to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**Qualifier Notes**

Sample Qualifiers :

AS-PRE: Due to the difficult nature of the bulk sample (interfering fibers/binders), additional NOB preparation was required prior to analysis

Z-01: Insufficient sample.

Z-01a: Layers inseparable.

**Work Order Revisions / Comments**

None



**APPENDIX 3**

**ANALYTICAL RESULTS – LEAD LABORATORY CERTIFICATE  
SAMPLING MARCH 2016**

## Certificate of Analysis

### Greenough Environmental Consulting Inc.

29 Capital Drive  
Ottawa, ON K2C 0E7  
Attn: Derek Stashick

Client PO:  
Project: 29067  
Custody:

Report Date: 21-Mar-2016  
Order Date: 16-Mar-2016

**Order #: 1612226**

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Parcel ID	Client ID
1612226-01	LS-01
1612226-02	LS-02
1612226-03	LS-03
1612226-04	LS-04
1612226-05	LS-05

Approved By:



Mark Foto, M.Sc.  
Lab Supervisor

Any use of these results implies your agreement that our total liability in connection with this work, however arising shall be limited to the amount paid by you for this work, and that our employees or agents shall not under circumstances be liable to you in connection with this work

**Analysis Summary Table**

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-OES	based on MOE E3470, ICP-OES	17-Mar-16	17-Mar-16

**Sample Data Revisions**

None

**Work Order Revisions/Comments:**

None

**Other Report Notes:**

n/a: not applicable  
ND: Not Detected  
MDL: Method Detection Limit  
Source Result: Data used as source for matrix and duplicate samples  
%REC: Percent recovery.  
RPD: Relative percent difference.

### Sample Results

Lead				Matrix: Paint
				Sample Date: 14-Mar-16
Parcel ID	Client ID	Units	MDL	Result
1612226-01	LS-01	ug/g	20	160
1612226-02	LS-02	ug/g	20	<20
1612226-03	LS-03	ug/g	20	183
1612226-04	LS-04	ug/g	20	<20
1612226-05	LS-05	ug/g	20	<20

### Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
<b>Matrix Blank</b>									
Lead	ND	20	ug/g						
<b>Matrix Duplicate</b>									
Lead	ND	20	ug/g	ND			0.0	30	
<b>Matrix Spike</b>									
Lead	176		ug/L	ND	70.5	70-130			

**APPENDIX 4**

**PHOTOS**



Photo 1 – View of remnant plaster on brick above ceiling grid (Red), and Siporex mortar (Green).



Photo 2 – View of Black Adhesive Pucks on Concrete Block above ceiling grid..



Photo 3 – View of asbestos 60cm x 120cm ACM ceiling tiles.



Photo 4 – View of asbestos 30cm x 30cm vinyl floor tile.



Photo 5 – View of asbestos grey exterior caulking on windows and flashing.



**APPENDIX 5**  
**TYPE-1 ASBESTOS ABATEMENT SPECIFICATION**

## Part 1 General

### 1.1 BACKGROUND

- .1 The Catholic District School Board of Eastern Ontario (CDSBEO) requires the services of a trained, qualified and insured asbestos abatement company for the pending window replacement project in the original building at the St. Mary's Catholic School located in Carleton Place, Ontario.
- .2 Asbestos, at a concentration of 0.5% or more by dry weight, has been identified in grey exterior caulking associated with the exterior windows and flashing within specified project areas. The identified asbestos-containing materials (ACMs) are summarized as follows:
  - .1 **14.06% Chrysotile asbestos** in non-friable exterior grey caulking
- .3 Other ACMs have been identified within the school and within the block exterior wall (vermiculite insulation). Because the pending window replacement will not reportedly impact these ACMs, this specification deals with the exterior caulking only. Should the scope of work change and additional materials need manipulation, the contractor must stop work and communicate with CDSBEO representatives for direction.
- .4 In addition to the identified ACMs, other designated substances exist in the pending works areas, including silica and lead which if disturbed may release fibres, fumes and/or particulates. Silica and lead are provincially regulated substances under Ontario Regulation 490/09 – and require that any manipulation be completed in a safe manner.
  - .1 This document provides instruction regarding the safe manipulation of the building materials and includes measures and procedures that should be followed to ensure the health and safety of the workers as well as occupants in proximity to the work area.

### 1.2 SECTION INCLUDES

- .1 This specification has been designed to provide practices and procedures for:
  - .1 Asbestos removal within the project area;
  - .2 Preventing cross-contamination between contaminated work areas and adjacent or nearby uncontaminated areas; and
  - .3 Protecting workers during work.

- .2 All work to be completed in accordance with Ontario Regulation 278/05 "Designated Substance: Asbestos on construction Projects and in Buildings and Repair Operations."

### 1.3 OUTLINE OF WORK

- .1 All work to be completed following Minimum Precautions Abatement Method (Type 1) as outlined in the following Section, and Occupational Health and Safety Act, Ontario Regulation 278/05 "Designated Substance: Asbestos on construction Projects and in Buildings and Repair Operations, which states:
  - .1 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos-containing material if,
    - .1 The work is done only by means of non-powered hand-held tools, and,
    - .2 The material is wetted to control the spread of dust or fibres.
  - .2 Comply with requirements of this Section when performing the following work:
    - .1 Removal of asbestos-containing exterior caulking from the exterior windows and flashing of the specified project areas.
  - .3 It is the responsibility of the bidding contractor to inspect and review site conditions as well as the CDSBEO scope of work for repairs - including quantifying ACMs - prior to submitting tender.
  - .4 The contractor should review any reports completed for the building in conjunction with the abatement specification to become familiar with the ACMs identified. Previous reports can be provided by CDSBEO, if requested.
  - .5 The contractor must ensure all electrical hazards, smoke and heat alarm issues are addressed prior to abatement. Costs associated with managing (i.e., moving or disabling) the aforementioned systems will be borne by the contractor (if required).
  - .6 Any work on ladders, planking, scaffolding and/or use of lift devices must be completed in accordance with CDSBEO's health and safety protocols including training (Fall Arrest) and personal protective equipment.
    - .1 Decontamination of the equipment is the responsibility of the abatement contractor (if applicable).

- .7 The abatement contractor is responsible that all personnel and subcontracts working at the buildings have asbestos awareness training. Proof in the form of signed certification along with proposed scheduling must be submitted to the CDSBEO prior to commencing work.
- .8 Notify the CDSBEO of material discovered during the work not apparent from the specifications, or report pertaining to the compliance work.
- .9 The CDSBEO may issue a stop work order at any time if concerns arise regarding safety, the integrity of the work area, security or other related concerns. If the CDSBEO issues a verbal or written "stop work order" due to personnel, environmental or property safety risks or due to violations of rules or regulations, the contractor shall immediately stop all work and *shall have no right to project delay claims*. The contractor shall not recommence work until authorized to do so by the CDSBEO.

#### 1.4 RELATED SECTIONS

- .1 See CDSBEO for supplementary reporting information.

#### 1.5 REFERENCES

- .1 Ontario Ministry of Labour.
  - .1 Occupational Health and Safety Act, Ontario Regulation 278/05 "Designated Substance: Asbestos on construction Projects and in Buildings and Repair Operations," 2005
- .2 Transport Canada (TC).
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .3 Ontario Ministry of Environment.
  - .1 Environmental Protection Act, R.R.O. 1990, Regulation 347, "General – Waste Management," as amended.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
  - .1 Material Safety Data Sheets (MSDS).
- .5 Transport Canada (TC).
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

## 1.6 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.
- .2 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): materials identified under Existing Conditions Article, including fallen materials and settled dust.
- .4 Minor Amounts of ACMs: less than or equal to 1m<sup>2</sup> of friable material containing Chrysotile asbestos.
- .5 Work areas: area where work takes place which will, or may disturb ACMs.
- .6 Authorized Visitors: Engineer[s], or designated representative[s], and representative[s] of regulatory agencies.
- .7 Friable Material: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .8 Occupied Area: any area of building or work site that is outside Work areas.
- .9 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .10 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

## 1.7 SUBMITTALS

- .1 Submittals in accordance with The CDSBEO requirements.
- .2 Submit proof satisfactory to The CDSBEO representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.

- .5 Submit to The CDSBEO necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .6 Submit proof satisfactory to The CDSBEO that employees have had instruction on hazards of asbestos exposure, respirator use, dress, entry and exit from Work areas, and aspects of work procedures and protective measures.
- .7 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by The CDSBEO Representative. Minimum of one supervisor for every ten workers.
- .8 Submit Worker's Compensation Board status and transcription of insurance.
- .9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
  - .1 Encapsulant products;
  - .2 Amended water;
  - .3 Spray glue; and
  - .4 Slow-drying sealer.

## **1.8 QUALITY ASSURANCE**

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, lead and silica provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Ontario Occupational Health and Safety Act.
  - .2 Safety Requirements: worker and visitor protection.
    - .1 Protective equipment and clothing to be worn by workers while in work areas include:
      - .1 Non-powered reusable or replaceable filter-type respirator equipped with HEPA filter cartridges, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction.

- .2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.
- .2 Eating, drinking, chewing, and smoking are not permitted in Work areas.
- .3 Before leaving work areas, dispose of protective clothing as contaminated waste as specified.
- .4 Ensure workers wash hands and face when leaving Work areas. Facilities for washing are located [as indicated on drawings].
- .5 Ensure that no person required to enter the work areas has facial hair that affects seal between respirator and face.
- .3 Visitor Protection:
  - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
  - .2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.
  - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work areas.

## **1.9 WASTE MANAGEMENT AND DISPOSAL**

- .1 Place materials defined as hazardous or toxic in designated containers.
- .2 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .3 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6ml bags or leak proof drums. Label containers with appropriate warning labels.
- .4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

## **1.10 EMERGENCY PRECAUTIONS**

- .1 The work areas are to be restricted only to authorized, trained, and protected personnel. These may include the Contractor's employees, employees of Sub-Contractors, Client's employees and representatives, provincial inspectors and any other designated

individuals. A list of authorized personnel shall be established prior to job start and posted in the clean room of the worker decontamination facility.

#### **1.11 EMERGENCY PLANNING**

- .1 Emergency planning and procedure shall be developed by the Contractor prior to abatement initiation and agreed to by the Contractor and The CDSBEO.
- .2 Emergency procedures shall be in written form and conspicuously posted in the clean change area and equipment room of the worker decontamination area.
- .3 Everyone, prior to entering the work area, must read and sign these procedures to acknowledge receipt and understanding of work site layout, location of emergency exits and emergency procedures.
- .4 Emergency planning shall include written notification to police, fire, and emergency medical personnel of planned abatement activities, work schedule and layout of the work area, particularly barriers that may affect response capabilities.
- .5 Emergency planning shall include consideration of fire, explosion, toxic atmospheres, electrical hazards, slips, trips and falls, confined spaces and heat related injury. Written procedures shall be developed and employee training in procedures shall be provided.
- .6 Employees shall be trained in evacuation procedures in the event of work place emergencies.
- .7 For non-life threatening situations, follow normal procedures with assistance from fellow workers if necessary, before exiting the work place to obtain proper medical treatment.
- .8 For life-threatening injury or illness, worker decontamination shall take least priority. After measures to stabilize the injured worker, remove him from the work place and secure proper medical treatment.
- .9 Telephone numbers of all emergency response personnel shall be prominently posted in the clean change area and equipment room, along with the location of the nearest telephone.

#### **1.12 FIRE PROTECTION**

- .1 The Contractor shall comply with all local fire safety regulations, rules and standards.



- .2 The Contractor is to ensure that the required exits from the work site are not impaired and that fire watches are set where necessary.
- .3 The Contractor will be required to meet any and all recommendations for job site safety and be required by CDSBEO and/or fire safety representative to meet their recommendations.
- .4 The Contractor shall maintain adequate fire extinguishers (Class A, B, & C) ready for immediate use and distributed throughout the work area and in and about flammable temporary structures for the duration of the project.

#### **1.13 RESPONSIBILITIES OF THE ENVIRONMENTAL CONSULTANT**

- .1 Greenough Environmental will complete periodic post abatement inspections of the work areas (frequency to be determined by CDSBEO Representatives) to check for completeness of the scope of work. The abatement contractor shall indicate on the spreadsheets provided, the abatement dates or any other significant notes for the specific work areas.

#### **1.14 SCHEDULING**

- .1 To be determined by CDSBEO. Assume all work to be completed outside of regular school hours.

#### **1.15 OWNER'S INSTRUCTIONS**

- .1 Before beginning Work, provide CDSBEO representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, in use of glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, at minimum:
  - .1 Fitting of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Disinfecting of equipment.
  - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.

## Part 2 Products

### 2.1 MATERIALS

- .1 Drop and Enclosure Sheets.
  - .1 Polyethylene: 0.15 mm thick.
  - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate containers.
  - .1 Inner container: 0.15 mm thick sealable polyethylene bag [or where glove bag method is used, glove bag itself].
  - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
  - .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site.
- .4 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .5 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
  - .1 Sealer: flame spread and smoke developed rating less than 50 [and be compatible with new fireproofing].

## Part 3 Execution

### 3.1 SUPERVISION

- .1 Minimum of one Supervisor for every ten workers is required.
- .2 Approved Supervisor must remain within Work areas during disturbance, removal, or other handling of asbestos-containing materials.

### 3.2 PROCEDURES

- .1 Before beginning Work, at each access to Work areas, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
  - .1 Use HEPA vacuum or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
  - .2 Do not use compressed air to clean up or remove dust from any surface.
- .2 Before beginning Work remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.
  - .1 Use polyethylene drop sheets over flooring that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.
- .3 Prevent spread of dust from Work areas using measures appropriate to work to be done.
  - .1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.
  - .2 Perform Work in a manner to reduce dust creation to lowest levels practicable.
- .4 Remove loose material by HEPA vacuum; thoroughly wet material containing asbestos to be removed or disturbed before and during Work unless wetting creates hazard or causes damage.
  - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos-containing waste using HEPA vacuum or by damp mopping.
  - .2 Place dust and asbestos-containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
  - .3 Immediately before their removal from Work areas and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
  - .4 Seal and remove double-bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
- .5 Clean-up:
  - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos-containing waste using HEPA vacuum or by damp mopping.
  - .2 Place dust and asbestos-containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
  - .3 Immediately before their removal from Work areas and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
  - .4 Seal and remove double-bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.

- .5 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

### **3.3 ADDITIONAL MEASURES AND PROCEDURES**

- .1 Silica or lead dust can be generated by drilling, coring, blasting, grinding, crushing and sandblasting silica-containing and lead-containing materials. Concrete, acoustic ceiling tiles, drywall, drywall joint compound, plaster, copper piping and/or cast iron drainage piping and painted finishes were identified in the project areas amongst the damaged ACMs.
- .2 Work on silica-containing and lead-containing materials can be performed by any construction personnel; however, because employers have a duty to protect their workers from silica exposure on construction projects, procedures should be taken to control the potential hazards.
- .3 All personnel involved with, or working in the area of, destructive activities as well as concrete and drywall joint compound and other building materials take the following precautions:
  - .1 Take all safety precautions, including the use of PPE, when dealing with silica-containing and lead-containing materials.
  - .2 Segregate the work areas from the rest of the building to reduce the risk of exposing building occupants to silica and lead dust. Workers leaving the work area should pass through a designated clean room where excess dust can be brushed off clothes and facilities are available to wash dust off skin.
  - .3 The work surfaces should be wetted regularly to limit dust released during striking and abrasion.
  - .4 Everyone in the work area should be provided with a half-face respirator equipped with HEPA filters.
  - .5 Take all necessary measures and procedures by means of engineering control, work and hygiene practices to ensure that airborne silica are reduced to the lowest practical level and in any event shall not exceed the amounts presented in Ontario Regulation 490/09.

### **3.4 AIR MONITORING**

- .1 Air monitoring may be completed at the discretion of the CDSBEO and will be commissioned by the CDSBEO.

**END OF SECTION**