Expanded Designated Substances Report - Update
Vanier Hall
136 Jean-Jacques-Lussier Private, Ottawa, Ontario
BCE PROJECT NUMBER 21-228

February 11, 2022

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EXECUTIVE SUMMARY

Buller Crichton Environmental Inc. (BCE) was retained by Francesco Nicolo of the University of Ottawa (Client), to provide an updated designated substance survey (DSS) and report for the Vanier Hall Building located at 136 Jean-Jacques-Lussier Private in Ottawa, Ontario (Site). The site survey was completed by BCE between June 14th and 18th, 2021.

The survey included an assessment for specified hazardous materials as well as assessment and sampling for eleven designated substances, as defined in Ontario Regulation 490/09: Designated Substances (O. Reg. 490/09) made under the Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter O.1, as amended, (OH&S Act). Substances surveyed included:

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

This report was prepared for the Client to fulfill the Duty of project owner’s requirement under Section 30 (1) of the OH&S Act; the requirements of Section 10 of Ontario Regulation 278/05: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, as amended (O. Reg. 278/05); and Ontario Regulation 490/09, s.19 (1) which indicates that an employer shall carry out an assessment of the exposure or likelihood of exposure of a worker to a designated substance in the workplace and record it in writing. This report must be provided to contractors prior to conducting demolition or renovation work at the Site.

For complete information and findings, as well as the limitations and recommendations, the reader should read the complete report.

See Appendix B for photo references.

See Appendix C for the Asbestos-Containing Materials Inventory.

See Appendix D for the Hazardous Materials Inventory.

See Appendix E for site plans.
Asbestos

Based on the results of the non-destructive visual assessment and historical sample analysis, the following asbestos-containing materials (ACMs) were identified or suspected to be present throughout the building:

<table>
<thead>
<tr>
<th>Building Material</th>
<th>Friable?</th>
<th>Location</th>
<th>Type of Asbestos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wall/Ceiling Plaster</td>
<td>Yes</td>
<td>Throughout Building</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Tar (Black)</td>
<td>No</td>
<td>Specific Areas Only</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Window Caulking (Black)</td>
<td>No</td>
<td>Specific Areas Only</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Transite Rainwater Leaders</td>
<td>No</td>
<td>Specific Areas Only</td>
<td>Presumed</td>
</tr>
<tr>
<td>Fire doors</td>
<td>Yes</td>
<td>Throughout Building</td>
<td>Presumed</td>
</tr>
<tr>
<td>Roofing Materials</td>
<td>Unknown</td>
<td>Roof</td>
<td>Presumed</td>
</tr>
</tbody>
</table>

*material assumed to contain asbestos until proven otherwise by means of material specific analysis by PLM.

Please refer to Table 1, Table 2, and Appendix C for further details on ACM concentrations and locations.

Lead

Based on the results of previous non-destructive visual assessments and historical sample analysis, multiple paint finishes throughout the building contain concentrations of lead above the Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair guideline limit of less than or equal to 0.1% lead by weight (1,000 μg/g). Please refer to Table 3 and Appendix D for further details on lead concentrations and locations.

In addition, the following materials, where found, should be considered to contain lead:

- Cast iron pipe fitting caulking,
- Lead acid batteries,
- Electrical components, including wiring connectors, grounding conductors, and solder,
- Solder on pipe connections,
- Mortars, and
- Ceramic tile glazing.

Mercury

Mercury is expected to present in the fluorescent light tubes, and pressure gauges and float switches observed at the Site. Caution should be exercised to ensure these materials are not broken during renovations, releasing droplets of mercury. Please refer to section 4.3 and Appendix D for further details on locations.
There is no occupational or environmental concern associated with mercury in its current state and condition. However, when the buildings are renovated the fluorescent lights and fixtures must be handled and disposed of in accordance with Ontario Regulation 490/09 (as amended January 1, 2020) and R.R.O. 1990 Regulation 347 – General - Waste Management as amended (O. Reg. 347/90).

**Silica**

Suspected silica-containing materials were not physically sampled during the DSS as they are known to be present in drywall, concrete, plaster, bricks, mortar and any other aggregates.

**Ozone Deplete Substances (ODSs)**

Refrigerators, freezers, water fountains, water coolers, etc. which contain or are suspected of containing ODSs have previously been identified. Please refer to section 4.5.2 and Appendix D for further details on locations.

**Radioactive Materials**

Equipment suspected of containing radioactive materials was previously identified in Room 2041. Please refer to section 4.5.3 and Appendix D for further details on locations.

**Above Ground Storage Tanks**

Above ground storage tanks were previously identified within the building. One (1) diesel Storage Tank was previously observed in Rooms 0140 and 7028A in good condition. Please refer to section 4.5.4 and Appendix D for further details on locations.

**Mould/Water Damage**

No obvious signs of mould were identified; however, water damage was noted in specified areas. Please refer to section 4.5.5 and Appendix D for further details on locations.

**Other Designated Substances & Hazardous Materials**

No other designated substances, as defined in O. Reg. 490/09 under the OH&S Act, or Hazardous Materials were observed at the Site.

Although BCE assessed all physically accessible areas, including destructive techniques, the possibility still exists that concealed materials may be found during any renovation or demolition process.

In the event any additional suspect designated substances are encountered during renovation or demolition activities, work on those materials must stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other designated substances.
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APPENDIX B: Site Photographs
APPENDIX C: Asbestos-Containing Materials Inventory
APPENDIX D: Other Designated Substances & Hazardous Materials Inventory
APPENDIX E: Drawings
INTRODUCTION
Buller Crichton Environmental Inc. (BCE) was retained by Francesco Nicolo of the University of Ottawa (Client), to provide an updated designated substance survey (DSS) and report for the Vanier Hall Building located at 136 Jean-Jacques-Lussier Private in Ottawa, Ontario (Site). The site survey was completed by BCE between June 14th and 18th, 2021.

SITE DESCRIPTION
The Vanier Hall Building is a seven-storey university building constructed in 1954. The subject building was observed to be constructed with a concrete slab floor; metal roof supported by steel trusses, beams and columns and contains an area of 150,320 square feet. The interior walls were gypsum wallboard and plaster. Within the subject building, ceilings were observed to be either suspended ceiling tiles, while open ceilings were observed in other areas of the building. The floors were generally polished concrete, terrazzo, and laminate, with the exception of select areas containing vinyl floor tiles and carpet.

SCOPE OF WORK
BCE’s scope of services can be found in Appendix A.

RESULTS AND DISCUSSION
Based on the review of previous reports, visual assessment and historical sampling, the following is a summary of the results.

4.1 Asbestos-Containing Materials
A summary of the materials previously sampled for asbestos is presented in Table 1 below. Sample references for historical data can be cross referenced to the reports listed in Appendix A. Sample locations of materials collected during the current assessment can be found in Appendix C.

<table>
<thead>
<tr>
<th>Sample Reference per Section 3.0 of this Report</th>
<th>Location</th>
<th>Material Description</th>
<th>Results</th>
<th>Friable (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Mechanical Room 0140</td>
<td>Yellow Insulation</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a</td>
<td>Mechanical Room 0140</td>
<td>White/Grey Debris</td>
<td>ND</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 1: Summary of Historical/Current Bulk Material Asbestos Analysis
### Historical Data

<table>
<thead>
<tr>
<th>Sample Reference per Section 3.0 of this Report</th>
<th>Location</th>
<th>Material Description</th>
<th>Results</th>
<th>Friable (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>Room 5041, 5063, 5068, 5000H (7 samples)</td>
<td>Sprayed Fireproofing (Grey)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>b</td>
<td>Room 5076, 5040, 1026, 5082 (7 samples)</td>
<td>Wall/Ceiling Plaster (White)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>b</td>
<td>Room 5076, 5040, 1026, 5082 (7 samples)</td>
<td>Wall/Ceiling Plaster (Grey)</td>
<td>0.5 CH</td>
<td>Y*</td>
</tr>
<tr>
<td>b</td>
<td>Room 5000F (3 samples)</td>
<td>SCT-2’x4’-Pinholes w/ Large Fissures</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>b</td>
<td>Room 1021 (3 samples)</td>
<td>Tar (Black)</td>
<td>2% CH</td>
<td>N</td>
</tr>
<tr>
<td>b</td>
<td>Room 7028 (3 samples)</td>
<td>Tar Paper Debris</td>
<td>&lt;MDL</td>
<td>N/A</td>
</tr>
<tr>
<td>b</td>
<td>Room 0140 (3 samples)</td>
<td>Wall Mastic (Black)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>b</td>
<td>Room 1070 (3 samples)</td>
<td>Window Caulking (Black)</td>
<td>1% CH</td>
<td>N</td>
</tr>
</tbody>
</table>

Bolded information indicated material is asbestos-containing.
* considered friable upon disturbance (by any means)

SCT = Suspended Ceiling Tiles
CH = Chrysotile Asbestos
ND = No asbestos detected in sample
NA = Not applicable as material is not asbestos-containing
<MDL = Less than the laboratory method detection limit of 0.5%. In accordance with O. Reg 278/05 an ‘asbestos-containing material’ is a material that contains >0.5% asbestos.

Note: If additional materials suspected to contain designated substances that were not previously visible / uncovered are encountered during any renovation or demolition activities that are not included in this report, work must be stopped, and further investigation be conducted at that time. Further investigation may include retaining the services of an environmental consulting firm to assess the material and samples as per O. Reg. 278/05. In the case that suspected ACMs cannot be tested, they must be treated as ACMs until proven otherwise.

Please refer to Appendix C – Asbestos-Containing Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions.

The following building materials (if present) have previously been investigated for asbestos content,

#### 4.1.1 Spray Applied Fireproofing

Sprayed fireproofing (Grey) was previously observed and sampled in Rooms 5043, 5063, 5068 and 5000H. The laboratory analytical results of samples collected indicate that this material does not contain asbestos.
4.1.2 Mechanical Pipe Insulation

4.1.2.1 Mechanical Pipe Straight Insulation
Mechanical pipe straight insulation was previously observed in Rooms 0140, 0189, 0100K, it was visually identified as fiberglass, and therefore not suspected of containing asbestos.

Mechanical pipe straight insulation was previously observed and sampled in Room 0140. The laboratory analytical results for the samples collected indicate that this material does not contain asbestos.

4.1.2.2 Mechanical Piping Elbows/Fittings Insulation
No mechanical pipe elbows/fittings insulation were previously observed in the subject building.

4.1.2.3 Mechanical Piping Hangers Insulation
No mechanical pipe hanger insulation was previously observed in the subject building.

4.1.2.4 HVAC Duct Insulation
No HVAC duct insulation was previously observed in the subject building.

4.1.2.5 Other Mechanical Insulation
No other mechanical insulation was previously observed in the subject building.

4.1.3 Flexible Duct Connector
Flexible duct connectors were previously observed in Room 2041. This material was visually identified as a non-asbestos containing material (i.e. rubber).

4.1.4 Heat Shield or Heat Shield Insulation
No heat shield insulation was previously observed in the subject building.

4.1.5 Texture Finishes
No texture coat finishes were previously observed in the subject building.

4.1.6 Plaster
Previously identified wall plaster was observed and sampled in Room 1000E, 1000H, 3000K and 3000N. This material contains 1% Chrysotile asbestos. Since plaster is a homogeneous material, all areas must be treated as asbestos-containing unless additional testing confirms otherwise. This material is considered friable and observed to be in good condition with the exception of select areas that were observed to be in poor condition.
Ceiling and wall plaster were observed and previously sampled from Room 1026, 5040, 5076, and 5082. The laboratory analytical results for the samples collected indicate that this material contains 0.5% Chrysotile. Since plaster is a homogeneous material, all ceiling/wall plaster within the building must be treated as asbestos-containing unless delineation and additional bulk sampling and analysis proves otherwise. This material is considered to be friable upon manipulation and was observed in good condition.

### 4.1.7 Drywall Joint Compound

Drywall joint compound was previously sampled from Rooms 014B, 014E, 1011, 1017, 1025, and 1030. The laboratory analytical results for the samples collected indicate that this material does not contain asbestos.

### 4.1.8 Ceiling Tiles

Several different types of ceiling tiles were observed and previously sampled within the subject building as follows:

- Suspended ceiling tile (2’x4’-Pinholes) was observed and previously sampled in Room 3047. The laboratory analytical results indicate that this material does not contain asbestos.

- Suspended ceiling tile (2’x4’-Large and Small Pinholes) was observed and previously sampled in Room 3000F. The laboratory analytical results indicate that this material does not contain asbestos.

- Suspended ceiling tiles (2’x4’-Pinholes and Large Fissures) were previously observed in Rooms 1021, 4000B, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4008A, 4009, 4010, 4012, 4013, 4015, 4016, 4017, 4018, 45019, 4020, 4021, 4022, 4023, 4024, 4025, 4026, 4027, 4028, 4040, 4041, 4042, 4043, 4044, 4044 (A-C), 4047, 4048, 4049, 4058, 4059, 4059A-C, 4062, 4063, 4064, 4064 (A-C), 4067, 4068, 4069, 5000H, 5015, 5016, 5017, 5018, 5019, 5020, 5021, 5022, 5023, 5024, 5025, 5026, 5027 and 5078. The laboratory analytical results of previously collected ceiling tile samples indicate that this material does not contain asbestos.

- Suspended ceiling tiles (2’x4’-Pinholes w/ Small Fissures) were previously observed in Room 5042, 5076, 5077, 5080, 5080(A-C). The date stamp on the back of these tiles indicated that they were manufactured in 2012 and therefore, this material is not considered to contain asbestos.
• Suspended ceiling tiles (2'x4'-Pinholes w/ Small Fissures) were previously observed in Room 1001(A-F). The date stamp on the back of these tiles indicated that they were manufactured in 2010 and therefore, this material is not considered to contain asbestos.

• Suspended ceiling tiles (2'x4'-Pinholes w/ Texture) were previously observed in Room 5002. The date stamp on the back of these tiles indicated that they were manufactured in 2012 and therefore, this material is not considered to contain asbestos.

4.1.9 Vinyl Floor Tiles
No vinyl floor tiles were observed in the subject building.

4.1.10 Vinyl Sheet Flooring
Several different types of ceiling tiles were observed and sampled within the subject building as follows:

• Vinyl sheet flooring (Grey) was observed and previously sampled in Room 3047. The laboratory analytical results indicate that this material does not contain asbestos.

• Vinyl sheet flooring (Beige) was observed and previously sampled in Room 1025. The laboratory analytical results for the samples collected indicate that this material does not contain asbestos.

• Vinyl sheet flooring (Red) was observed and previously sampled in Room 1030. The laboratory analytical results for the samples collected indicate that this material does not contain asbestos.

• Vinyl sheet flooring (Light Grey) was observed and previously sampled in Room 1011. The laboratory analytical results for the samples collected indicate that this material does not contain asbestos.

4.1.11 Brick Mortar
No brick mortar was previously observed in the subject building.

4.1.12 Concrete Block Mortar
No concrete block mortar was previously observed in the subject building.

4.1.13 Transite (Asbestos Cement)
Transite rainwater leaders are suspected to be present in Room 5068 and 5069. The condition of the material could not be visually assessed in these areas due to the presence of fireproofing
insulation covering the Transite. To avoid possible damage, no bulk samples of the transite piping were collected. However, this material is known to contain asbestos. This material is considered to be non-friable and was observed in good condition.

4.1.14 Caulking
Window caulking (Black) was observed and previously sampled from Room 1070 and all stairwells throughout the subject building. The laboratory analytical results indicate that this material contains 1% Chrysotile asbestos. This material is considered to be non-friable and was observed in good condition.

4.1.15 Cementitious Coating
No cementitious coating finishes were observed in the subject building.

4.1.16 Tar
Several different types of tar materials were previously observed and sampled within the subject building as follows:

- Tar (Black) was previously sampled and observed on the ceiling in Room 1021. The laboratory analytical results indicate that this material contains 2% Chrysotile asbestos. This material is considered non-friable and was not observed at the time of the site visit.
- Tar paper debris was previously sampled and observed from Room 7028. The laboratory analytical results indicate that this material contains <0.5% Chrysotile asbestos. Under O. Reg.278/05 this material is less than the stated regulatory limit and is considered to be non-asbestos containing.
- Tar adhesive (Black) was previously observed and previously sampled in Rooms 0141B and 0141E. The laboratory analytical results indicate that this material does not contain asbestos.

4.1.17 Mastic
Wall mastic (Black) was previously observed and sampled on the walls of Room 0140. The laboratory analytical results for the samples collected indicate that this material does not contain asbestos.

4.1.18 Fire Doors
Fire doors were observed at various locations throughout the subject building. To avoid possible damage, no bulk samples of the internal door insulation materials were collected. Prior to removal and/or replacement, fire doors should be examined and tested for asbestos content. Fire doors should be considered to contain asbestos until bulk samples and analysis proves otherwise. All fire doors were observed to be in good condition.
4.1.19 Roofing Material
To avoid damage and compromising the integrity of roofing material, no bulk samples of the roofing materials were collected. Prior to removal and/or replacement, roofing materials should be examined and tested for asbestos content. Roofing materials should be considered to contain asbestos until bulk samples and analysis proves otherwise.

4.1.20 Recommendations
- Although not identified during the site visit, any future asbestos-containing materials identified to be in poor condition must be repaired/removed immediately, following work procedures as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Although not identified during the site visit, any future asbestos-containing materials identified to be in fair condition should be scheduled to be repaired/removed. Timeline for repair/removal is dependent on the potential risk of exposure to worker and/or occupants;
- Materials identified to contain asbestos that are in good condition can be managed in place. Prior to renovation/demolition activities that may disturb the ACMs, these materials must be removed following work procedures as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Prior to renovation/demolition of materials which are assumed to be asbestos-containing (Transite panels, fire doors, etc.), these materials must either be tested for asbestos content or removed in accordance with O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Entry into ceiling spaces where asbestos-containing ceiling tiles are present will require Type-1 or Type-2 asbestos abatement precautions depending on the total area of tiles to be removed.
- Please refer to Appendix C – Asbestos-Containing Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions;
- Asbestos containing waste must also be handled and disposed of according to O. Reg. 347/90. Any suspect building materials encountered that were not assessed as part of this survey, should be assumed to contain asbestos until proven otherwise by analytical testing;
- This report must be provided to contractors prior to conducting demolition or renovation work at the Site. A copy of the DSR must be immediately available at the Site whenever workers are present. Further, contractors shall have an exposure control plan in place for each designated substance identified in this report as being in way of the planned work.
- Since ACMs are present within the building, an Asbestos Management Plan (AMP) is required, and an inventory of ACMs must be kept on site. All ACMs must be routinely inspected to ensure no damage has occurred, and the inventory must be updated once in each 12-month period;
- Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials.

Table 2 provided below outlines the removal / management requirements / options.
## Table 2: ACMs – Removal Recommendations

<table>
<thead>
<tr>
<th>Asbestos Containing Material (ACM)</th>
<th>ACM Location</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Wall/Ceiling Plaster (Grey Base Layer) | Throughout Building     | 1) Remove following Type 2 precautions if 1 square meter or less of the material will be removed or disturbed  
OR  
2) Remove following Type 3 precautions if greater than one square meter will be removed or disturbed. |
| Window Caulking (Black)           | Room 1070 & Stairwells Throughout | 1) Remove following Type 1 precautions if removed or disturbed with hand tools and the materials are wetted.  
OR  
2) Type 2 precautions if removed or disturbed with power tools equipped with a HEPA filtered dust collection system.  
OR  
3) Type 3 precautions if the work is completed with power tools not equipped with HEPA filtered dust collection system. |
| Tar (Black)                       | Room 1021               | 1) Remove following Type 1 precautions if removed or disturbed with hand tools and the materials are wetted.  
OR  
2) Type 2 precautions if removed or disturbed with power tools equipped with a HEPA filtered dust collection system.  
OR  
3) Type 3 precautions if the work is completed with power tools not equipped with HEPA filtered dust collection system. |
Asbestos Containing Material (ACM)

<table>
<thead>
<tr>
<th>ACM Location</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room 5068 &amp; 5069</td>
<td>1) Remove following Type 1 precautions if removed or disturbed with hand tools and the materials are wetted. OR 2) Type 2 precautions if removed or disturbed with power tools equipped with a HEPA filtered dust collection system. OR 3) Type 3 precautions if the work is completed with power tools not equipped with HEPA filtered dust collection system.</td>
</tr>
</tbody>
</table>

Fire doors (presumed) Throughout Building Prior to removal, it must be sampled, and verified whether the material is friable or non-friable. This determination will dictate the proper abatement protocols to satisfy O. Reg 278/05.

Roofing materials (presumed) Roof Prior to removal, it must be sampled, and verified whether the material is friable or non-friable. This determination will dictate the proper abatement protocols to satisfy O. Reg 278/05.

If the ACM is to remain, manage in accordance with Section 8 of O. Reg. 278 / 05.

4.2 Lead-Containing Materials

A summary of the materials previously sampled for lead for the purpose of this survey is presented in Table 3 below. Sample references for historical data can be cross referenced to the reports listed in Section 3.0 Scope of Work.

Table 3: Results of Bulk Material Lead Analysis

<table>
<thead>
<tr>
<th>Sample Reference per Section 3.0 of this Report</th>
<th>Location</th>
<th>Material Description</th>
<th>Results (µg/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>Room 4020</td>
<td>Dark Green Door Frame Paint</td>
<td>1,300</td>
</tr>
<tr>
<td>b</td>
<td>Room 3015</td>
<td>White Wall Paint</td>
<td>800</td>
</tr>
<tr>
<td>b</td>
<td>Room 2070</td>
<td>Grey Stair Railing Paint</td>
<td>12,000</td>
</tr>
<tr>
<td>b</td>
<td>Room 1011</td>
<td>Door Frame Paint</td>
<td>&lt;0.002</td>
</tr>
</tbody>
</table>

- Paint finishes highlighted in blue were determined to contain low concentrations of lead (<1000 µg/g).
- Paint finishes highlighted in pink were determined to contain high concentrations of lead (>1000 µg/g).
All other paints throughout the building not mentioned in this report must be considered to be lead-containing until project specific sampling proves otherwise.

The following materials, where found, should be considered to contain lead:

- Cast iron pipe fitting caulking;
- Electrical components, including wiring connectors, grounding conductors, and solder;
- Solder on pipe connections;
- Ceramic tile glazing; and
- Mortars.

### 4.2.1 Recommendations

- Please refer to Appendix D – Hazardous Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions.
- Although not identified during the site visit, any future paints identified to contain lead that are in poor condition must be immediately repaired and/or stabilized following a minimum Type 1/2 lead abatement procedures as per Ministry of Labour, Training and Skills Development Guidelines – Lead on Construction Projects, 2011.
- Although not identified during the site visit, any paints identified to contain lead that are in fair condition should be either repaired (where possible) and/or closely monitored for signs of further deterioration.
- Paints identified to contain lead that are in good condition and do not pose a risk to workers or occupants can be managed in place.
- Prior to renovation/demolition of materials not mentioned in this report must be considered to be lead-containing until project specific sampling proves otherwise.
- This report must be provided to contractors prior to conducting demolition or renovation work at the Site. A copy of the DSR must be immediately available at the Site whenever workers are present. Further, contractors shall have an exposure control plan in place for each designated substance identified in this report as being in way of the planned work.
- Although construction site projects are exempt from the requirements of Ontario Regulation 490/09 and Ontario Regulation 833, the general duty requirements under Occupational Health and Safety Act, employers are still required to do everything reasonable and practicable to protect workers from workplace hazards. Maintaining worker exposure within the prescribed air borne occupational exposure levels is considered best management practice for construction workers. These include:
  - The OEL-TWA of a worker to lead is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.05 mg/m³ of air.
  - To achieve the above, the following recommendations are made with respect to lead at the Site.
o All work should be completed with procedures as described in the Ministry of Labour, Training and Skills Development Guidelines Lead on Construction Projects, 2011.

o All work should be completed with procedures as described in the EACC Lead Guideline for Construction, Renovation, Maintenance or Repair.

  ▪ This guideline establishes a de minimis (i.e. virtually safe) level of lead in paint or surface coatings where a hazard would not likely be present. Lead content of 0.1% (i.e. 1000 μg/g or 1000 mg/kg or 1000 ppm lead) is considered a de minimis level of lead in paint or surface coatings, provided that aggressive disturbance or heating does not occur. This applies to tasks that do not create excessive or significant dust, mist or fume. Tasks that generate significant dust, mist or fume are excluded and always require adherence to Class 2 or Class 3 operations or require an exposure assessment.

  ▪ Alternatively, a hygiene or exposure assessment can be performed to determine procedures that are required. This assessment requires an understanding of what methods will be used to disturb the paint.

o All workers present on site during demolition activities should be trained against the hazards of lead exposure and provided with a respirator with P-100 High Efficiency Particulate Air (HEPA) filtration that is personally fit tested to the worker wearing it.

  ▪ Water and ventilation should be used to keep dust levels to a minimum.

  ▪ The work area should be isolated with banner tape warning of the hazards of lead exposure. Workers within this isolated work area should be wearing the required personal protective equipment.

  ▪ No dry sweeping or use of compressed air should be used during clean-up activities. Instead, HEPA filtered vacuums and wet sweeping should be used.

  ▪ Workers should wash their hands and face prior to leaving Site to avoid the spread of lead dust and continued inhalation when not on Site.

o All waste material must be handled and disposed of according to the Revised Regulation of Ontario 347/90 as amended – made under the Environmental Protection Act. Lead waste generated may also be subject to Leachate Criteria (Schedule 4) of this regulation.

4.3 Mercury

Findings

4.3.1 Thermostat Switches
Previous assessments did not observe thermostats containing liquid mercury within the subject building.
4.3.2 Fluorescent Light Tubes
Fluorescent light fixtures throughout the surveyed area were previously identified as containing 2 to 4 fluorescent light tubes per fixture. Mercury is likely to be present in vapor form in the fluorescent light tubes.

4.3.3 Pressure Gauges and Float Switches
Pressure gauges containing liquid mercury have been previously observed in Room 0189.

Suspected float switches that may contain liquid mercury have been previously identified within Room 0189 within the subject building. They were observed in good condition.

Recommendations
- Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.
- Caution should be exercised to ensure light tubes, switches or gauges are not broken during renovations, releasing droplets of mercury. There is no occupational or environmental concern associated with mercury in its current state and condition.
- Exposure to mercury is regulated under Ontario Regulation 490/09, Designated Substances – made under the Occupational Health and Safety Act.
- Best management practices dictate that the mercury containing fixtures must be returned to a participating recycling centre or picked up and disposed of by a licensed hazardous materials contractor of in accordance with R.R.O. 1990, Regulation 347 General – Waste Management, made under the Environmental Protection Act.
- Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

4.4 Silica

Findings
- Silica has not been physically sampled previously as it would cause damage to the Site. Silica is presumed to be present in the concrete, concrete block, cement, mortar, plaster, drywall, masonry, and mortars used to construct the Site. Silica-containing materials were observed to be in good condition at the time of the assessment. There is no occupational or environmental concern associated with materials pertaining to silica in its current state and condition.
Recommendations

- Please refer to Appendix D – Hazardous Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions.

- This report must be provided to contractors prior to conducting demolition or renovation work at the Site. A copy of the DSR must be immediately available at the Site whenever workers are present. Further, contractors shall have an exposure control plan in place for each designated substance identified in this report as being in way of the planned work.

- Although construction site projects are exempt from the requirements of Ontario Regulation 490/09 and Ontario Regulation 833, the general duty requirements under Occupational Health and Safety Act, employers are still required to do everything reasonable and practicable to protect workers from workplace hazards. Maintaining worker exposure within the prescribed air borne occupational exposure levels is considered best management practice for construction workers. These include:
  
  o The Occupational Exposure Limit – Time Weighted Average (OEL-TWA) of a worker to silica dust is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.10 mg/m³ of air for quartz and Tripoli, and 0.05 mg/m³ of air for cristobalite and tridynite.
  
  o To achieve the above, the following recommendations are made with respect to silica at the Site.
    
    ▪ All work should be completed with procedures as described in the Ministry of Labour, Training and Skills Development Guidelines Silica on Construction Projects, 2011.
    
    ▪ All workers present on site during demolition activities should be trained against the hazards of silica exposure and provided with a respirator with P-100 High Efficiency Particulate Air (HEPA) filtration that is personally fit tested to the worker wearing it.
    
    ▪ Water and ventilation should be used to keep dust levels to a minimum.
    
    ▪ The work area should be isolated with banner tape warning of the hazards of silica exposure. Workers within this isolated work area should be wearing the required personal protective equipment.
    
    ▪ No dry sweeping or use of compressed air should be use during clean-up activities. Instead, HEPA filtered vacuums and wet sweeping should be used.
    
    ▪ Workers should wash their hands and face prior to leaving Site to avoid the spread of silica dust and continued inhalation when not on Site.
4.5 Other Hazardous Materials

4.5.1 Polychlorinated Biphenyls (PCBs)

Findings

4.5.1.1 Light Ballasts
The subject building is illuminated by LED and fluorescent lights. Previous assessments have been completed of representative ballasts in the building, and these ballasts were identified as non-PCBs content. Light ballasts were previously observed to be manufactured by Phillips.

4.5.1.2 Transformers
Previous assessments have not observed any PCB-containing electrical transformers within the subject building. Transformers that could be assessed were observed to be dry-type and manufactured by Warner Power.

Recommendations
Since no PCB-containing equipment has previously been observed or suspected to be present during the site survey, no further action is required.

4.5.2 Ozone Depleting Substances (ODSs) and Other Halocarbon

Findings
Previous visual assessments for equipment potentially containing ODSs and other halocarbons has been conducted. Equipment such as refrigerators, freezers, water fountains, water coolers, etc. were observed, which contain or are suspected of containing ODSs or other halocarbons.

No other equipment containing ODSs or other halocarbons was observed in the subject building.

Recommendations
Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.

Under the management of a licensed contractor, equipment containing R134A and R22 does not represent a significant threat to human health or the environment however, a licensed contractor must decommission equipment such that CFCs are contained and not released to the environment during servicing or operation.
4.5.3 Radioactive Materials

Findings
A visual assessment of the subject building was previously conducted to determine if any electrical components containing radioactive materials were present. Equipment suspected of containing radioactive materials was previously identified in Room 2041.

Recommendations
Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.

These materials do not pose a hazard if they remain contained and properly disposed at the time of removal or replacement.

Prior to any renovations or demolition of the building, all equipment containing radioactive materials must be decommissioned by a licensed contractor such that radioactive materials are contained and not released to the environment during decommissioning as per O.Reg. 347/09.

4.5.4 Underground and Above Ground Storage Tanks (USTs and ASTs)

Findings
A visual survey of the subject building was previously conducted to determine if any USTs and ASTs were present. One (1) diesel Storage Tanks was previously observed in Rooms 0140 and 7028A.

Recommendations
Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.

Prior to any demolition in the buildings, all USTs and ASTs equipment must be decommissioned by a licensed contractor such that substances are contained and not released to the environment during decommissioning.
4.5.5 Mould

Findings

4.5.5.1. Mould
A visual survey of the subject building was conducted to determine if any mould was present. BCE did not observe any areas with obvious signs of visible mould growth.

4.5.5.2. Water Damage
A visual survey of the subject building was conducted to determine if any water damaged was present. BCE identified selected locations throughout the building where materials were affected by water damage.

Recommendations
Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.

Water stained/damaged building materials observed throughout the subject building should be replaced/repaird as part of regular maintenance and the underlying cause of the water leakage should be identified and repaired.

4.6 Other Designated Substances
The following Designated Substances do not require any action and are not addressed in this section:

- Benzene
- Vinyl Chloride
- Acrylonitrile
- Ethylene Oxide
- Arsenic
- Isocyanate
- Coke Oven Emissions

5 LIMITATIONS
This report was prepared for the exclusive use of the Client. This report is based on data and information collected during the Site visit conducted between June 14th and 18th, 2021 by BCE Inc. as described in this report.

The conclusions and recommendations contained in this report are based upon professional opinions regarding the subject matter. These opinions are in accordance with currently accepted environmental assessment standards and practices applicable to these locations and are subject to the following inherent limitations:
The data and findings presented in this report are valid as of the date of the investigation. The passage of time, manifestation of latent conditions or occurrence of future events may warrant further exploration at the properties, analysis of the data, and re-evaluation of the findings, observations, and conclusions expressed in this report.

The findings, observations and conclusions expressed by BCE in this report are not, and should not be considered, an opinion concerning compliance of any past or present owner or operator of the building with any federal, provincial or local laws or regulations.

Additional Designated Substances not identified in this report may become evident during demolition activities. Should additional information become available, BCE requests that this information be brought to our attention so that we may re-assess the conclusions presented herein. All quantities contained in this report are approximate and based on visual observations made in accessible areas.

Although effort was made to expose and sample potential designated substances, there is a possibility that additional concealed substances/materials may be present beneath existing flooring, behind wall cavities, roof systems, above ceilings, and any other inaccessible areas such as pipe chases at the Site.

Should further designated substances be encountered during any renovation or demolition activities, those materials must be managed in accordance with applicable regulations.
6 CLOSURE

If you have any questions or require any further information, please feel free to contact the undersigned. Thank you for the opportunity to be of service. We look forward to working with you again.

BULLER CRICHTON ENVIRONMENTAL INC.

Prepared By: 
Emily Morgan
Environmental Health and Safety Technician

Reviewed By: 
Derek Stashick, B.Ed, WRT, CMI
Senior Project Manager
APPENDIX A:
Scope of Work, Regulatory Requirements, Methodology & Background Information
SCOPE OF WORK

BCE’s scope of services was limited to the following:

1. Reviewing the Site to identify any building materials suspected of containing designated substances and hazardous materials and noting their condition.
2. BCE also reviewed the following reports prior to the site assessment:
3. Collecting samples of accessible building materials that are suspected to contain asbestos and lead for laboratory analysis by an independent, third-party accredited laboratory if requested and/or deemed necessary.

Providing a comprehensive summary report of designated substances identified at the Site with recommendations for removal and/or management as required.

REGULATIONS and GUIDELINES

Designated Substances – Ontario Regulation 490/09

Ontario Regulation 490/09 (O. Reg. 490/09): Designated Substances under the Act lists/defines the Designated Substances and provides the associated exposure limits:

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

It should be noted that Section 14 of O. Reg. 490/09 indicates that the regulation does not apply to:

a) To an employer who engages in construction; or

b) To the workers of an employer described in clause (a) who are engaged in construction.

O. Reg. 490/09 does not apply to construction; however, it is frequently referenced as defining Designated Substances. The exposure limits presented in O. Reg. 490/09 are consistent with exposure limits presented in Ontario Regulation 833 – Control of Exposure to Biological or Chemical Exposure (O. Reg 833), which in recent amendments, no longer excludes construction.

Designated Substances - OH&S Act, R.S.O. 1990, c. O.1

Section 30 of the OH&S Act requires that a document summarizing the presence of these designated substances must be available to contractors and subcontractors requesting tenders, prior to beginning a construction project (including building renovation or demolition). This report serves that
purpose. However, scaled drawings and contract specifications are still required on a project-by-project basis.

**Asbestos**

Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05) made under the OH&S Act, outlines specific procedures for identifying asbestos in buildings and on construction sites. In addition, it outlines requirements for their removal and/or re-assessment and management depending on whether any identified materials are to remain in the building. ACM in good condition can remain in the building if it is managed as prescribed in this regulation, including but not limited to implementation of an Asbestos Management Plan (AMP), annual condition assessment, notification to tenants and training for specified workers. However, any asbestos-containing materials (ACM) must be removed prior to disturbance as a result of renovations and/or demolition of the Site.

R.R.O. 1990, Regulation 347 General – Waste Management as amended (O. Reg. 347/90), made under the Ontario Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended (EPA) sets out requirements for general waste management including ACM. This regulation requires the disposal of asbestos waste in double sealed containers (e.g., a six-mil (0.15 mm) polyethylene bag or hard plastic barrel), properly labelled and free of cuts, tears, or punctures. The waste must be disposed of in a licensed waste facility which has been properly notified of the presence of asbestos waste.

**Lead**

O. Reg. 490/09, as amended regulates lead exposure in the work environment. Apart from construction sites, this regulation is enforceable at all work sites in Ontario. Lead on construction sites is regulated through O. Reg 833 as well as through the Ministry of Labour, Training and Skills Development (MLTSD) Guideline – Lead on Construction Projects (revised in April 2011) and enforceable through section 25 (2) (h) of the OH&S Act.

Disposal of lead must be conducted in accordance with the requirements of Reg. 347 General – Waste Management. The regulation details the minimum requirements for the appropriate transport and disposal of wastes, including acceptable Leachate Quality Criteria (Toxicity Characteristic Leaching Procedure – TCLP).

Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair is intended for the environmental abatement industry, construction industry and the painting industry in general.

Various occupational and workplace safety authorities and agencies consider that, depending on the type of disturbance, airborne lead could be generated in hazardous levels from any amount of lead in a paint or surface coating. As such, these agencies have not set a level of lead in paint at which lead-related precautions are not required (a de minimis level).

Similarly, there is no established concentration of lead below which lead procedures are not required if a lead-containing material is disturbed. However, the EACC guideline establishes a de minimis (i.e., virtually safe) level of lead in paint or surface coatings where a hazard would not likely be present.
For the purpose of this guideline, paints or surface coatings containing less than or equal to 0.1% lead by weight (1000 μg/g) are considered low-level lead paints or surface coatings. If these materials (and the surfaces to which they are applied) are disturbed in a non-aggressive manner, performed using normal dust control procedures and are completed so that the time-weighted average (TWA) for Particles Not Otherwise Specified (PNOS) is not exceeded, then worker protection from the inhalation of lead is not required.

General health and safety precautions must still be implemented, which may include, in part, prohibiting eating, drinking, smoking and chewing in the work area, implementing dust suppression techniques and washing facilities for workers to wash hands and face. In terms of requirements associated with the specialized removal, the National Master Specification (NMS) format is to be followed as well as applicable industry standard, including procedures described in the Ministry of Labour Guidelines – Lead on Construction Projects, 2011 and the EACC Lead Guideline. In summary, worker training and containment of work areas must be completed as classified by the EACC, including Class 1, Class 2A, Class 2B, Class 3A and Class 3B Operations.

**Mercury**

O. Reg. 490/09, as amended regulates mercury exposure in the work environment. Except for construction sites, this regulation is enforceable at all work sites in Ontario. Mercury on construction sites is regulated through O. Reg 833.

Disposal of materials containing mercury shall be done in accordance with O. Reg. 347/90.

**Silica**

O. Reg. 490/09, as amended regulates silica exposure in the work environment. Except for construction sites, this regulation is enforceable at all work sites in Ontario. Exposure to silica on construction sites can happen through the inhalation of dust created from the disturbance of concrete, drywall, ceiling tiles, mortars etc. As a result, airborne exposure to silica on construction sites is regulated through O. Reg 833. In addition, the Ministry of Labour, Training and Skills Development (MLTSD) Guideline – Silica on Construction Projects (revised in April 2011) outlines ways to reduce exposure and protect workers on construction sites. This guideline is enforceable through section 25 (2) (h) of the OH&S Act.

**Polychlorinated Biphenyls (PCBs)**

Polychlorinated Biphenyls (PCBs) were commonly used as dielectric insulating fluid in electrical equipment such as transformers and capacitors, and in the fluorescent and HID lamp ballasts. The production of PCBs in the North America began in 1929 but was banned in 1979. After 1981, no manufacturers produced fluorescent and HID lamps with PCB-containing ballasts.

Please note that PCBs are not considered to be a designated substance under the Occupational Health and Safety Act.
The PCB Regulations (SOR/2008-273) set specific deadlines for ending the use of PCBs in concentrations at or above 50 mg/kg, eliminating all PCBs and equipment containing PCBs currently in storage and limiting the period of time PCBs can be stored before being destroyed. The Regulations also establish sound practices for the better management of the remaining PCBs in use (i.e. those with content of less than 50 mg/kg), until their eventual elimination, to prevent contamination of dielectric fluids and dispersion of PCBs in small quantities into other liquids.

Ozone Depleting Substances (ODSs) and Other Halocarbons

Within Ontario, ozone depleting substances (ODSs) and other halocarbons is controlled through Regulation 463/10 of the Environmental Protection Act. Production of ODSs in the form of hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) was halted in Canada in 1993 as a result of their ozone-depleting characteristics. Importing CFCs into Canada stopped in 1997 and total ban was placed on CFCs in 2010. The use of these materials is still permitted in existing equipment, but equipment must be serviced by a licensed contractor such that CFCs are contained and not released to the environment during servicing or operation.

Radioactive Materials

There are two types of smoke detectors commonly found in building (residential, institutional, commercial, industrial, etc). Photoelectric-type smoke detectors detect smoke using an optical sensor, whereas ionization-type smoke detectors use an ionization chamber containing radioactive material. The ionization type is cheaper and is particularly common in older buildings. A typical modern detector contains about 1.0 microcurie of the radioactive element americium, a decrease from 3 microcurie in 1978. The use of sealed radioactive material sources in fire detection systems is still permitted and regulated by the Canadian Nuclear Safety Commission (CNSC) and the Canadian Nuclear Safety Act. The radioactive sources in smoke alarms are sealed and contained within a metal case inside the smoke detector and must not be damaged or tampered with.

Mould & Water Damage

Mould is not specifically regulated in the province of Ontario. However, there are guidelines set forth by The American Industrial Hygiene Association (AIHA), Health Canada and the Environmental Abatement Council of Canada (EACC, 2015). All these guidelines recommend that any building materials supporting mould growth should be remediated as rapidly as possible to ensure a healthy environment. Once the presence of mould is confirmed, precautions for removal are based on an approximation of the extent of visible and potentially hidden mould growth, with input from a competent health and safety professional.

OTHER DESIGNATED SUBSTANCES

Vinyl Chloride
Vinyl chloride (monomer) is likely to be present in stable form within poly vinyl-chloride (PVC) piping and conduits and as a component of interior finishes. Such building materials are not considered to be hazardous in their current matrix/composition.

**Acrylonitrile**

Acrylonitrile or ACN (also known as vinyl cyanide) is an explosive, flammable liquid used in the manufacture of acrylic fibres, rubber-like materials and pesticide fumigants. Acrylonitrile was not noted and would not be expected to be present in the project specific area/surveyed area/subject building.

**Arsenic**

Arsenic is used in metallurgy for hardening copper, lead and alloys, in pigment production, in the manufacture of certain types of glass, in insecticides, fungicides and rodenticides, as a by-product in the smelting of copper ores, and as a dopant material in semiconductor manufacturing. Arsenic or arsenic compounds were not noted and are not expected to be present in the project specific area/surveyed area/subject building.

**Benzene**

Benzene or benzol is a colourless liquid. It is used as an intermediate in the production of styrene, phenol, cyclohexane, and other organic chemicals, and in the manufacture of detergents, pesticides, solvents, and paint removers. It is also found in gasoline. Benzene may be present in stable form in roofing materials, paints and adhesives located throughout the subject building. Such building materials are not considered to be hazardous in their current matrix/composition.

**Coke Oven Emissions**

Coke oven emission is benzene soluble fraction of total particulate matter of the substances emitted into the atmosphere from metallurgical coke ovens.

**Ethylene Oxides**

Ethylene oxide is a colourless gas liquefying below 12°C. It is used generally as a fumigant and sterilizing agent for medical equipment. It is used generally as a fumigant and sterilizing agent for medical equipment.

**Isocyanates**

Isocyanates compounds may be present in stable form in paint finishes, varnishes, and polyurethane plastics, synthetic rubbers, foams and adhesives. Such building materials are not considered to be hazardous in their current matrix/composition.

**METHODODOLOGY**
Site sampling and assessment was completed between June 14th and 18th, 2021 by Emily Morgan of BCE.

**Designated Substances**

**Asbestos**

**Friability**

O. Reg 278/05 requires that asbestos-containing materials (ACMs) be classified according to their friability. The classification is either designated as friable or non-friable. Friable products are those which can easily be crumbled by hand and release asbestos fibres into the air presenting a risk of inhalation exposure to those around. Non-friable products are not easily crumbled by hand and as a result less likely to release airborne asbestos fibres. However, precautions are important as non-friable ACMs can still release fibres when sanded, cut, abraded or drilled, especially with power tools.

**Homogeneous Materials**

Homogenous materials are those that are uniform in colour and texture. Homogeneous materials were assumed to be similar in content. Samples were randomly collected to be representative of each suspect asbestos containing material and then assigned a homogenous material number accordingly.

**Sampling and Analysis**

Building materials suspected of containing asbestos were sampled in a manner to ensure that adequate sample volume was collected. Locations of materials sampled were documented and an indication of whether the material was friable or not was documented. The number of samples collected for each suspect material was completed as prescribed by O. Reg. 278/05 and detailed below in Table 1 – Material Sampling Requirements.

**Table 1: Material Sampling Requirements**

<table>
<thead>
<tr>
<th>Type of Material</th>
<th>Size of Area of Homogeneous Material</th>
<th>Minimum Number of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise. Examples include acoustical plaster on ceilings and fireproofing materials on structural members</td>
<td>Less than 90 m²</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>90 or more m², but less than 450 m²</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>450 or more m²</td>
<td>7</td>
</tr>
<tr>
<td>Thermal insulation, except as described below</td>
<td>Any size</td>
<td>3</td>
</tr>
<tr>
<td>Thermal insulation patch</td>
<td>Less than 2 linear meters or 0.5 m²</td>
<td>1</td>
</tr>
</tbody>
</table>
Where applicable, samples of suspected ACMs were submitted to an independent accredited laboratory (Paracel Laboratories) of Ottawa, Ontario for asbestos content analysis. Paracel is a fully accredited facility for asbestos analysis. Polarized Light Microscopy was completed in accordance with U.S. Environmental Protection Agency (EPA) methodologies and dispersion staining techniques (EPA 600/R-93/116).

Materials are defined as asbestos-containing if they are more than 0.5% asbestos by dry weight. Less than this amount is not considered to be an asbestos-containing material in the province of Ontario.

**Evaluation of ACMs Based on Condition**

In evaluating an ACM’s condition, the following criteria was applied:

- **Good** – Material shows no signs of damage and/or is encapsulated. Asbestos-containing material could remain in place until eventual building demolition or major renovation.
- **Fair** – Material shows signs of minor damage (<5% damage) or otherwise near the end of useful life. This includes minor shrinking, cracking, delamination and/or other damage. Material should be monitored closely and scheduled to be repaired, encapsulated or removed.
- **Poor** – Damage is greater than 5% to any ACM material and is highly recommended to be removed, repaired or encapsulated.

**Lead**

Where applicable, samples of the primary interior finishes were collected using destructive means (i.e. a razor scraper) to ensure that adequate sample volume was collected. In addition, any suspected lead products that could not be sampled were visually assessed and documented (e.g. lead in pipe solder, lead in cast-iron pipe fittings and lead in emergency lighting batteries).

The Occupational Exposure Limit – Time Weighted Average (OEL-TWA) of a worker to lead dust is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.05 mg/m³.

**Mercury**

Mercury was not physically sampled as part of the assessment but was visually assessed and documented where noted. In a building environment, this typically includes mercury vials in older thermostats, mercury vapour in fluorescent light tubes and metal halide lamps. The elemental mercury in the thermostat vials and light tubes presents an occupational exposure risk to workers when the glass is broken and the liquid and/or vapour is released.

**Silica**

Silica is ubiquitous in our environment and present in numerous building products including, but not limited to, concrete, drywall, plaster, ceiling tiles, and mortar. The silica in these products is confined
within the substrate of the material and therefore does not pose a hazard unless released and inhaled by an individual. As a result, it is not possible to sample the silica without causing a significant amount of disturbance. Therefore, BCE visually assessed and documented these materials where noted.

The OEL-TWA of a worker to silica dust is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.10 mg/m³ of air for quartz and Tripoli, and 0.05 mg/m³ of air for cristobalite and tridymite.
APPENDIX B:
Site Photographs
<table>
<thead>
<tr>
<th>Photo #</th>
<th>Material Location / Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>View of asbestos-containing tar (Black) previously observed to be in fair condition on the plaster ceiling in Room 1021.</td>
</tr>
<tr>
<td>2</td>
<td>View of asbestos-containing window caulking previously observed to be in good condition in Room 1070 and other stairwells throughout the subject building.</td>
</tr>
<tr>
<td>3</td>
<td>View of presumed asbestos-containing Transite pipe previously observed to be in good condition in Room 5068.</td>
</tr>
<tr>
<td>Photo #</td>
<td>Material Location / Description</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>4</td>
<td>View of non-asbestos containing wall mastic (Black) previously observed in Room 0140.</td>
</tr>
<tr>
<td>5</td>
<td>View above ground storage tank previously observed to be in good condition in Room 7028A.</td>
</tr>
<tr>
<td>6</td>
<td>View of water staining previously observed on suspended ceiling tiles in Room 5069A.</td>
</tr>
<tr>
<td>Photo #</td>
<td>Material Location / Description</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>7</td>
<td>View of storage unit containing radioactive materials previously observed to be in good condition in Room 2041.</td>
</tr>
</tbody>
</table>
APPENDIX C:
Asbestos-Containing Materials Inventory
## Appendix C - Asbestos-Containing Materials Checklist

<table>
<thead>
<tr>
<th>Floor/Level</th>
<th>Location</th>
<th>Type of ACM</th>
<th>Asbestos Confirmed/Suspected</th>
<th>Friable/Non-Friable</th>
<th>Damaged/Deteriorated</th>
<th>Accessibility</th>
<th>Level of Work Near Material</th>
<th>Approx. Quantity</th>
<th>Unit</th>
<th>Recommended Action</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Throughout Level Ceiling and Wall Plaster</td>
<td>Confirmed Friable</td>
<td>Good Condition</td>
<td>Difficult</td>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>Throughout Level Fire Doors</td>
<td>Suspected</td>
<td>-</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Throughout Level Ceiling and Wall Plaster</td>
<td>Confirmed Friable</td>
<td>Good Condition</td>
<td>Difficult</td>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Throughout Level Fire Doors</td>
<td>Suspected</td>
<td>-</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Room 1021 Tar on Ceiling</td>
<td>Confirmed Non-Friable</td>
<td>Good Condition</td>
<td>Difficult</td>
<td>Low</td>
<td>60 LF</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Room 1070 Window Caulking (Black)</td>
<td>Confirmed Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
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<td>Easy</td>
<td>Low</td>
<td>Throughout</td>
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<td>Throughout All Stairwells</td>
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<td>Difficult</td>
<td>Low</td>
<td>-</td>
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<td>-</td>
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<td>Low</td>
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<td>Good Condition</td>
<td>Difficult</td>
<td>Low</td>
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<td>Low</td>
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<td>Difficult</td>
<td>Low</td>
<td>-</td>
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## Appendix C - Asbestos-Containing Materials Checklist

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<th>Type of ACM</th>
<th>Asbestos Confirmed/Suspected</th>
<th>Friable/Non-Friable</th>
<th>Damaged/ Deteriorated</th>
<th>Accessibility</th>
<th>Level of Work Near Material</th>
<th>Approx. Quantity</th>
<th>Unit</th>
<th>Recommended Action</th>
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<td>Low</td>
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<td>Throughout All Stairwells</td>
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<td>Friable</td>
<td>Good Condition</td>
<td>Difficult</td>
<td>Low</td>
<td>-</td>
<td>-</td>
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<td>Fire Doors</td>
<td>Suspected</td>
<td>-</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>-</td>
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<td>Good Condition</td>
<td>Difficult</td>
<td>Low</td>
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<td>Fire Doors</td>
<td>Suspected</td>
<td>-</td>
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<td>Easy</td>
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<td>Low</td>
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APPENDIX D:
Other Designated Substances & Hazardous Materials Inventory
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<th>Floor/Level</th>
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<th>Type</th>
<th>Component</th>
<th>Colour</th>
<th>Condition</th>
<th>Manufacturer</th>
<th>Approx. Quantity</th>
<th>Unit</th>
<th>Suspected/Confirmed</th>
<th>Recommended Action</th>
<th>Comments</th>
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<td>0</td>
<td>Throughout Level</td>
<td>Mercury</td>
<td>Fluorescent Light Tubes</td>
<td>N/A</td>
<td>Good Condition</td>
<td>Varies</td>
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<td></td>
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<td>0</td>
<td>Room 0140</td>
<td>Ozone Depleting Substances (ODS)</td>
<td>Diesel Storage Tank</td>
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<td>Good Condition</td>
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<td>1</td>
<td>C</td>
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<td>Ozone Depleting Substances (ODS)</td>
<td>Refrigerator/Freezer/Mini-Fridge/Water Cooler</td>
<td>N/A</td>
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<td>R-134A</td>
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<td>N/A</td>
<td>-</td>
<td></td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<tr>
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<td>Fluorescent Light Tubes</td>
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<td>Varies</td>
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<td>Condition</td>
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<td>Unit</td>
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APPENDIX E:
Drawings
LEVEL 0 FLOOR PLAN, VANIER HALL

NOTE: ASBESTOS-CONTAINING PLASTER PRESENT THROUGHOUT
LEVEL 1 FLOOR PLAN, VANIER HALL

NOTE: ASBESTOS-CONTAINING PLASTER PRESENT THROUGHOUT

LEGEND
ASBESTOS-CONTAINING PLASTER
ASBESTOS-CONTAINING WINDOW CAULKING
ASBESTOS-CONTAINING REMNANT TAR

DESIGNATED SUBSTANCE SURVEY

UNIVERSITY OF OTTAWA

FEBRUARY 11, 2022

Project Location:
VANIER HALL, 136 JEAN-JACQUES-LUSSIER PRIVATE, OTTAWA ON

Client:
DATE: FEBRUARY 11, 2022

Completed by: JR
Checked by: DS
Project Number: VNR-02

BULLER CRICHTON ENVIRONMENTAL INC.
1 Raymond Street, Suite 102, Ottawa, Ontario K1R 1A2
613-729-5291 bullercrichton.ca
NOTE: ASBESTOS-CONTAINING PLASTER PRESENT THROUGHOUT

LEVEL 3 FLOOR PLAN, VANIER HALL
NOTE: ASBESTOS-CONTAINING PLASTER PRESENT THROUGHOUT

LEVEL 4 FLOOR PLAN, VANIER HALL

LEGEND

ASBESTOS-CONTAINING PLASTER
ASBESTOS-CONTAINING WINDOW CAULKING
LEVEL 6 FLOOR PLAN, VANIER HALL

NOTE: ASBESTOS-CONTAINING PLASTER PRESENT THROUGHOUT

F.H.C.

PROJECT:

DATE:

COMPLETED BY:

CHECKED BY:

PROJECT NUMBER:

DESIGNATED SUBSTANCE SURVEY

21-228

VANIER HALL, 136 JEAN-JACQUES-LUSSIER PRIVATE, OTTAWA ON

VNR-07
NOTE: ASBESTOS-CONTAINING PLASTER PRESENT THROUGHOUT
NOTE: ROOF MATERIALS ARE PRESUMED TO BE ASBESTOS-CONTAINING