Expanded Designated Substances Report - Update
200 Lees Avenue (Blocks A & E), Ottawa, Ontario
BCE Project Number 21-228

February 18th, 2022

PREPARED FOR:
University of Ottawa

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REVIEWED BY:

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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 building located at 200 Lees Avenue (Blocks A & E) in Ottawa, Ontario (Site). The site survey was completed by BCE May 19\textsuperscript{th}, 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>Exterior Soffit Plaster</td>
<td>Yes</td>
<td>Building Exterior</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Exterior Caulking</td>
<td>No</td>
<td>Building Exterior</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Interior Window Caulking</td>
<td>No</td>
<td>Specific Areas Only</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Transite</td>
<td>No</td>
<td>Specific Areas Only</td>
<td>Presumed</td>
</tr>
<tr>
<td>Fire doors*</td>
<td>Unknown</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 the non-destructive visual assessment 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). Lead shielding material is suspected present within the walls of E029. 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, pressure gauges and float switches previously 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 throughout the building. 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 E029. Please refer to section 4.5.3 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.
Table of Contents

1 INTRODUCTION .................................................................................................................................................. 1
2 SITE DESCRIPTION .............................................................................................................................................. 1
3 SCOPE OF WORK................................................................................................................................................. 1
4 RESULTS AND DISCUSSION ................................................................................................................................ 1
  4.1 Asbestos-Containing Materials ................................................................................................................... 1
  4.2 Lead-Containing Materials ........................................................................................................................ 10
  4.3 Mercury ..................................................................................................................................................... 12
  4.4 Silica ........................................................................................................................................................... 13
  4.5 Other Designated Substances / Hazardous Materials ............................................................................. 14
  4.6 Other Designated Substances .................................................................................................................. 17
5 LIMITATIONS ..................................................................................................................................................... 17
6 CLOSURE ........................................................................................................................................................... 18

TABLES

Table 1: Summary of Historical/Current Bulk Material Asbestos Analysis .................................................. 1
Table 2: ACMs – Removal Recommendations ............................................................................................ 8
Table 3: Results of Bulk Material Lead Analysis ....................................................................................... 10

APPENDICES

APPENDIX A: Scope of Work, Regulatory Requirements, Methodology & Background Information

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 building located at 200 Lees Avenue (Blocks A & E) in Ottawa, Ontario (Site). The site survey was completed by BCE on May 19th, 2021.

SITE DESCRIPTION
The subject building is comprised of two (2) distinct premises (A and E) and range from one to three storeys. The subject building was observed to be constructed with a concrete slab floor; metal roof supported by steel trusses, beams, and columns. The interior walls were gypsum wallboard and concrete block, with select areas containing ceramic tiles. Within the subject building, ceilings were observed to be generally suspended ceiling tiles, while open ceilings were observed in other areas of the building. The floors were generally concrete throughout the subject building apart from select units containing vinyl floor tiles, terrazzo flooring, laminate flooring and carpet. Building A was constructed circa 1963 while Building E was constructed circa 1980.

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>Exterior Overhang Soffit</td>
<td>Soffit Plaster</td>
<td>2% CH</td>
<td>Y*</td>
</tr>
<tr>
<td>a</td>
<td>Exterior Overhang</td>
<td>Pebble Dash Stucco</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a</td>
<td>Exterior Overhang</td>
<td>Caulking</td>
<td>2% CH</td>
<td>N</td>
</tr>
</tbody>
</table>

Table 1: Summary of Historical/Current Bulk Material Asbestos Analysis
<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>Joint b</td>
<td>Room A100H (7 samples)</td>
<td>Drywall Joint Compound</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A124, Wall (3 samples)</td>
<td>Concrete Block Mortar (Grey)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>c</td>
<td>Room A02 (3 samples)</td>
<td>Gasket (Beige)**</td>
<td>65% CH</td>
<td>Y</td>
</tr>
<tr>
<td>c</td>
<td>Room 104C (3 samples)</td>
<td>Mechanical Pipe Fitting Insulation (Grey)**</td>
<td>60% CH</td>
<td>Y</td>
</tr>
<tr>
<td>c</td>
<td>Room A105 (3 samples)</td>
<td>Mechanical Pipe insulation (Brown)**</td>
<td>10% CH</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>Room A140 (3 samples)</td>
<td>Floor levelling compound (Brown/Black)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A139 (3 samples)</td>
<td>Wall Plaster (Gray)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A144 (3 samples)</td>
<td>High Traffic Floor Coating (Beige)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>c</td>
<td>Room A139 (3 samples)</td>
<td>Window Caulking (Black)</td>
<td>2% CH</td>
<td>N</td>
</tr>
<tr>
<td></td>
<td>Room A136 (3 samples)</td>
<td>VFT (12”x12”- Off white with Gray &amp; Black streak)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A138E (3 samples)</td>
<td>VFT (12”x12”-Beige with Brown &amp; Grey flakes)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A122B (3 samples)</td>
<td>VFT (12”x12”- Olive green with Grey flakes)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A147 (3 samples)</td>
<td>VFT (12”x12” – Grey with Blue streaks)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A122B (3 samples)</td>
<td>Mastic (Black)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A142 (3 samples)</td>
<td>Concrete Block Mortar (Grey)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A106C (3 samples)</td>
<td>Wall Tile Grout (Grey)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A139 (7 samples)</td>
<td>Wall Texture Coating (Grey)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A36 (3 samples)</td>
<td>SCT (2’x4’- Fissures)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A106 (3 samples)</td>
<td>SCT (2’x4’- Pinholes with Large Fissures)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room A106C (3 samples)</td>
<td>VFT (12”x12”-Red with flakes)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room E041 (3 samples)</td>
<td>VFT (12”x12”-Offwhite with Blue streaks)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room E053 (3 samples)</td>
<td>VFT (12”x12”-Grey with White &amp; Light Grey streaks)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Room E244 (3 samples)</td>
<td>VFT (12”x12”- Offwhite with Grey streaks)</td>
<td>ND</td>
<td>N/A</td>
</tr>
</tbody>
</table>
### 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>Room A136, A139A, E146, E053 (7 samples)</td>
<td></td>
<td>Drywall Joint Compound (White)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>Room E038 (3 samples)</td>
<td></td>
<td>Drywall Joint Compound (White)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>Room A144 (7 samples)</td>
<td></td>
<td>Ceiling Plaster</td>
<td>ND</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Bolded information indicated material is asbestos-containing.

* Considered friable upon disturbance (by any means)

** Historical – Not observed during survey

CH = Chrysotile Asbestos

TM = Tremolite

ND = No asbestos detected in sample

NA = Not applicable as material is not asbestos-containing

VFT = Vinyl Floor Tiles

SCT = Suspended Ceiling Tiles

<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

No spray applied fireproofing was previously observed in blocks A or E of the building.

#### 4.1.2 Mechanical Pipe Insulation

##### 4.1.2.1 Mechanical Pipe Straight Insulation

No mechanical pipe straight insulation was observed in blocks A & E. Asbestos-containing pipe straight insulation was previously identified in Room A105, but this material has been removed.
4.1.2.2 Mechanical Piping Elbows/Fittings Insulation
Mechanical piping elbows/fitting insulation was previously observed and sampled from the E-Block Penthouse. The laboratory analytical results for the samples collected indicate that this material does not contain asbestos.

No other mechanical pipe fittings were observed in blocks A or E. Asbestos-containing pipe fitting insulation was previously identified in Room A104C and E029, but based on the 2021 survey, this material has been removed from these locations.

4.1.2.3 Mechanical Piping Hangers Insulation
Mechanical pipe hanger insulation was previously observed in the in A Block Hallways and was visually identified to be a material not suspected to contain asbestos (i.e. fibreglass) and thus not sampled.

4.1.2.4 HVAC Duct Insulation
HVAC duct insulation was previously observed within the mechanical rooms A02 and E301 within subject building and was visually identified to be a material not suspected to contain asbestos (i.e. fibreglass) and thus not sampled.

4.1.2.5 Other Mechanical Insulation
No other mechanical insulation was observed in blocks A or E. An asbestos-containing gasket (beige) was previously observed in Room A02, but this material has since been removed.

4.1.3 Flexible Duct Connector
No flexible duct connectors were observed in the subject building.

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

4.1.5 Texture Finishes
Wall texture coating was previously observed and sampled in Room A139. The laboratory analytical results of the samples collected indicate that this material does not contain asbestos.

4.1.6 Plaster
Wall plaster (Grey) on diamond mesh lath was previously observed and sampled in Room B215N. The laboratory analytical results of samples collected indicated that this material contained 1% Tremolite asbestos. Visually similar ceiling plaster on diamond mesh lath was previously observed in Room A142 but has since been removed (March 2020). Although this material was not identified in Block
A during the 2021 site visit, Blocks A, B, C and D were all the same age of construction, therefore any gray plaster on diamond mesh lath that is identified should be considered to be asbestos-containing.

Wall and column plaster was previously sampled from Room A139. The laboratory analytical results of the samples collected indicate that this material does not contain asbestos.

Ceiling plaster was previously sampled from Room A144. The laboratory analytical results of the samples collected indicate that this material does not contain asbestos.

Exterior soffit plaster was previously sampled from the exterior of the building. The laboratory analytical results indicate that this material contains 2% Chrysotile asbestos. This material is considered friable upon manipulation and was observed to be in good condition.

4.1.7 Drywall Joint Compound
Drywall joint compound was observed throughout the subject building and sampled from the following locations: A136, A139A, E146, E053 and E038. The laboratory analytical results of drywall joint compound samples collected from these locations indicate that this material does not contain asbestos.

4.1.8 Ceiling Tiles
Ceiling tiles were observed in various locations throughout the subject building.

- Suspended ceiling tiles (2'x4'-Pinhole with Large Fissures) were observed in Room A106. The laboratory analytical results of the samples collected indicate that this material does not contain asbestos.
- Suspended ceiling tiles (2'x4'-Fissures) were observed in Room A036. The laboratory analytical results of the samples collected indicate that this material does not contain asbestos.

4.1.9 Vinyl Floor Tiles
Several different types of vinyl floor tiles were observed and sampled within the building as follows:

- Vinyl floor tiles (12''x12'' – Red with flakes) were observed in Room A106C. The laboratory analytical results of the vinyl floor tile samples collected indicate that this material and its associated mastic (black) does not contain asbestos.
- Vinyl floor tiles (12”x12” – Off-white with blue streaks) were observed in Room E041. The laboratory analytical results of the vinyl floor tile samples collected indicate that this material and its associated mastic (yellow) does not contain asbestos.

- Vinyl floor tiles (12”x12” – Grey with white and light grey streaks) were observed in Room E053. The laboratory analytical results of the vinyl floor tile samples collected indicate that this material and its associated mastic (yellow) does not contain asbestos.

- Vinyl floor tiles (12”x12” – Off-white with grey streaks) were observed in Room E224. The laboratory analytical results of the vinyl floor tile samples collected indicate that this material and its associated mastic (black) does not contain asbestos.

4.1.10 Leveling Compound
Floor levelling compound was previously sampled from Room A140. The laboratory analytical results indicate that this material does not contain asbestos.

Floor levelling compound was previously sampled from Room A122. The laboratory analytical results indicate that this material does not contain asbestos.

4.1.11 Concrete Block Mortar
Concrete block mortar was previously sampled from the interior of the building in Room A142. The laboratory analytical results indicate that this material does not contain asbestos.

4.1.12 Ceramic Wall / Floor Tile Grout
Ceramic wall tile (Grey) grout was previously sampled from the A106C. The laboratory analytical results indicate that this material does not contain asbestos.

4.1.13 Transite (Asbestos Cement)
Transite materials were observed as segments of conduit pipe in Room A138C. 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
Interior window caulking (Black) was previously sampled from Room A139. The laboratory analytical results indicate that this material contains 2% Chrysotile asbestos. This material is considered non-friable and was observed to be in good condition.
Exterior overhang joint caulking was previously sampled from the exterior overhang joint. The laboratory analytical results indicate that this material contains 2% Chrysotile asbestos. This material is considered non-friable and was observed to be in good condition.

4.1.15 Cementitious Coating
Cementitious floor levelling compound was observed and previously sampled in Room A140. The laboratory analytical results of cementitious coating samples collected indicate that this material does not contain asbestos.

High traffic floor coating was observed and previously sampled in Room A144. The laboratory analytical results of cementitious coating samples collected indicate that this material does not contain asbestos.

4.1.16 Tar
Previously identified roofing tar (Black) was sampled from the roof level of the subject building. The laboratory analytical results for the samples collected indicate that the material does not contain asbestos.

4.1.17 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.

4.1.18 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.

4.1.19 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, 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;
• 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>
<thead>
<tr>
<th>Asbestos Containing Material (ACM)</th>
<th>ACM Location</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soffit Plaster</td>
<td>Exterior Overhang Soffit</td>
<td>1) Type 2 precautions if &lt; 1 m² is removed and tools with HEPA filtered attachments are used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2) Type 3 precautions if &gt; 1 m² is removed and/or tools with HEPA filtered attachments are not used.</td>
</tr>
<tr>
<td>Asbestos Containing Material (ACM)</td>
<td>ACM Location</td>
<td>Recommendations</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------</td>
<td>-----------------</td>
</tr>
</tbody>
</table>
| Caulking                         | Exterior Overhang Joint | 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. |
| Window Caulking (Black)          | Room A139   | 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. |
| Transite (presumed)              | Room A138C  | 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. |
| 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. |
### Asbestos Containing Material (ACM)

<table>
<thead>
<tr>
<th>ACM Location</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throughout Building</td>
<td>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.</td>
</tr>
</tbody>
</table>

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>
<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>A139</td>
<td>White Wall Paint</td>
<td>900</td>
</tr>
<tr>
<td>b</td>
<td>A105</td>
<td>Dark Grey Door Frame Paint</td>
<td>29,000</td>
</tr>
<tr>
<td>b</td>
<td>A100H</td>
<td>Marron Wall Paint</td>
<td>&lt;20</td>
</tr>
<tr>
<td>b</td>
<td>A100H</td>
<td>Light Grey Wall Paint</td>
<td>&lt;20</td>
</tr>
<tr>
<td>b</td>
<td>Exterior Wall</td>
<td>Dark Grey Wall Paint</td>
<td>&lt;20</td>
</tr>
<tr>
<td>c</td>
<td>A140 – Above door vent</td>
<td>Beige Paint</td>
<td>753</td>
</tr>
<tr>
<td>c</td>
<td>A140</td>
<td>Blue Door Paint</td>
<td>8</td>
</tr>
<tr>
<td>c</td>
<td>A144</td>
<td>Beige Floor Paint</td>
<td>173</td>
</tr>
<tr>
<td>c</td>
<td>A122</td>
<td>Black Wall Paint</td>
<td>579</td>
</tr>
<tr>
<td>c</td>
<td>E254</td>
<td>Off White Wall Paint</td>
<td>20</td>
</tr>
<tr>
<td>c</td>
<td>E010</td>
<td>White Wall Paint</td>
<td>600</td>
</tr>
<tr>
<td>c</td>
<td>Hallway E100</td>
<td>Blue Paint on Doors and Frames</td>
<td>1,100</td>
</tr>
<tr>
<td>c</td>
<td>E218</td>
<td>Brown Paint on Doors and Frames</td>
<td>10,000</td>
</tr>
<tr>
<td>c</td>
<td>A139</td>
<td>White Wall Paint</td>
<td>900</td>
</tr>
<tr>
<td>c</td>
<td>A131</td>
<td>Blue Paint on Doors and Lockers</td>
<td>19,000</td>
</tr>
<tr>
<td>c</td>
<td>Hallway A130</td>
<td>Yellow Paint on Lockers</td>
<td>29,000</td>
</tr>
<tr>
<td>d</td>
<td>A144</td>
<td>Beige Floor Paint</td>
<td>143</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.

4.2.1 Battery Packs

Lead-containing acid battery packs have historically been identified throughout the subject building. These battery packs were observed on walls and above exits throughout the surveyed building.

Lead may also be present in the following materials in the building:

- Solder used on copper domestic water lines;
- Solder used in bell fittings for cast iron pipes;
- Solder used in electrical equipment;
- Ceramic tile glaze; and,
- Concrete and mortar products, etc.

4.2.2 Lead Shielding

Historically, diagnostic equipment suspected to contain radioactive materials within Room E029 have been identified. Lead shielding material is suspected to be present within the walls of E029.

4.2.3 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.
- All work should be completed with procedures as described in the Ministry of Labour, Training and Skills Development Guidelines Lead on Construction Projects, 2011.
- 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.
- 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 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 lead dust and continued inhalation when not on Site.
- 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
No observed thermostats containing liquid mercury were previously identified within the 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 in mechanical rooms were previously identified throughout the building. Also, suspected float switches that may contain liquid mercury were previously identified within Room A02. 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 or switches 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 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 (manufactured by Sylvannia).

4.5.1.2. **Transformers**
Previous assessments have not observed any PCB-containing electrical transformers within the building.

**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. Additional equipment including ODSs within laboratories and mechanical rooms were observed within the 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 R4100A, R407, R404 and R134A do 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**
Previous assessments have not observed any electrical equipment suspected of containing radioactive materials in the building.
GE-brand Medical Systems diagnostic equipment containing suspected radioactive materials was previously observed within Room E029. This equipment was observed to be in good condition.

**Recommendations**

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

Under the management of licensed contractor, equipment containing radioactive materials must be decommissioned 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**

Previous visual surveys of the subject building were conducted to determine if any USTs and ASTs were present. No USTs and ASTs were observed within the surveyed area.

**Recommendations**

Since no underground and/or above ground storage tanks (USTs and ASTs) were observed or suspected to be present during the site survey, no further action is required.

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. Water damage was not present on building materials.

**Recommendations**

Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.
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 on May 19th, 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: [Signature]
Emily Morgan, HB.Sc.
Environmental Health and Safety Technician

Reviewed By: [Signature]
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:
   a) “Project Specific Designated Substance Survey, Exterior Overhang Soffit Repairs, 200 Lees Avenue, Ottawa, ON” – Prepared by EHS Partnerships Limited (EHS) dated June 3\(^{rd}\), 2019
   d) “Project Specific Hazardous Materials Survey, University of Ottawa – 200 Lees A Block, Redevelopment Project” – Prepared by McIntosh Perry (MPL) dated September 1\(^{st}\), 2020
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.
4. 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
- Asbestos
- Vinyl Chloride
- Mercury
- Ethylene Oxide

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.

**METHODOLOGY**
Site sampling and assessment was completed May 19th, 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>
<tr>
<td>Any other material</td>
<td>Any size</td>
<td>3</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>
<th>Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Room 139 / View of interior window caulking (black) observed to be in good condition</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Mechanical Room A138C / View of asbestos containing Transite pipe (highlighted in red) observed to be in good condition</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Room E029 / View of diagnostic machine suspected to contain radioactive materials observed</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Throughout the surveyed building / Typical view of non-PCB containing light ballast</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Throughout A100H, A123, A124 / View of ceiling tiles (2x4' Pinhole &amp; Fissures) which were observed to be manufactured in 2012</td>
<td></td>
</tr>
<tr>
<td>Photo #</td>
<td>Material Location / Description</td>
<td>Photo</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>6</td>
<td>Throughout A100H, A123, A124 / View of the fibreglass mechanical insulation observed</td>
<td><img src="image1.jpg" alt="Photo" /></td>
</tr>
<tr>
<td>7</td>
<td>Rooms A124 and A123 / Representative view of the finishes observed</td>
<td><img src="image2.jpg" alt="Photo" /></td>
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<td>8</td>
<td>Rooms A123, A123A, A124, and A124A / View of the open ceiling space</td>
<td><img src="image3.jpg" alt="Photo" /></td>
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<td>9</td>
<td>Rooms A100H, A123, A124 / View of the fibreglass mechanical insulation</td>
<td><img src="image4.jpg" alt="Photo" /></td>
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<td>10</td>
<td>Rooms A123A and A124A / Representative view of the finishes</td>
<td><img src="image5.jpg" alt="Photo" /></td>
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<td>Photo #</td>
<td>Material Location / Description</td>
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<td>------------------------------------------------------</td>
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<tr>
<td>11</td>
<td>Exterior Area of A Block / Representative view</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Exterior Area of A Block / Representative view</td>
<td></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>Type of ACM</th>
<th>Damaged/Deteriorated</th>
<th>Accessibility</th>
<th>Level of Work Near Material</th>
<th>Quantity #</th>
<th>Unit</th>
<th>Recommended Action</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Throughout Level</td>
<td>Fire Doors</td>
<td>Suspected</td>
<td>Non-Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>N/A</td>
<td>N/A</td>
<td>Manage in Place</td>
<td></td>
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<tr>
<td>1</td>
<td>Room A139</td>
<td>Window Caulking</td>
<td>Confirmed</td>
<td>Non-Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Moderate</td>
<td>~300</td>
<td>LF</td>
<td>Manage in Place</td>
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<td>1</td>
<td>Room A138C</td>
<td>Transite</td>
<td>Suspected</td>
<td>Non-Friable</td>
<td>Good Condition</td>
<td>Difficult</td>
<td>Low</td>
<td>1</td>
<td>LF</td>
<td>Manage in Place</td>
<td></td>
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<tr>
<td>1</td>
<td>Throughout Level</td>
<td>Fire Doors</td>
<td>Suspected</td>
<td>Non-Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Moderate</td>
<td>N/A</td>
<td>N/A</td>
<td>Manage in Place</td>
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<tr>
<td>2</td>
<td>Throughout Level</td>
<td>Fire Doors</td>
<td>Suspected</td>
<td>-</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>N/A</td>
<td>Manage in Place</td>
<td></td>
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<tr>
<td>Exterior</td>
<td>Throughout</td>
<td>Soffit Plaster</td>
<td>Confirmed</td>
<td>Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Moderate</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
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<tr>
<td>Exterior</td>
<td>Throughout</td>
<td>Caulking</td>
<td>Confirmed</td>
<td>Non-Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Moderate</td>
<td>-</td>
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<tr>
<td>Roof</td>
<td>Throughout Level</td>
<td>Roofing Materials</td>
<td>Suspected</td>
<td>-</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>N/A</td>
<td>Manage in Place</td>
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APPENDIX D:
Other Designated Substances & Hazardous Materials Inventory
<table>
<thead>
<tr>
<th>Floor/Level</th>
<th>Location</th>
<th>Type</th>
<th>Component</th>
<th>Colour</th>
<th>Condition</th>
<th>Manufacturer</th>
<th>Quantity</th>
<th>Unit</th>
<th>Suspected/Confirmed</th>
<th>Recommended Action</th>
<th>Comments</th>
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<td>Battery Pack</td>
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<td>Good Condition</td>
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<td>C</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<tr>
<td>0</td>
<td>A02</td>
<td>Lead</td>
<td>Battery Pack</td>
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<td>C</td>
<td>Confirmed</td>
<td>Manage In Place</td>
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<tr>
<td>0</td>
<td>A02</td>
<td>Mercury</td>
<td>Pressure Gauges, Float Switch</td>
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<td>Various</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>0</td>
<td>E037</td>
<td>Ozone Depleting Substances (ODS)</td>
<td>Refrigerator/Freezer/Mini-Fridge/Water Cooler</td>
<td>N/A</td>
<td>Good Condition</td>
<td>Frigidaire</td>
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<td>C</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<td>Room E043</td>
<td>Ozone Depleting Substances (ODS)</td>
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<td>Good Condition</td>
<td>Woods</td>
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<tr>
<td>0</td>
<td>E010 Hallway</td>
<td>Lead</td>
<td>Paint</td>
<td>White</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Confirmed</td>
<td>Manage in Place</td>
<td></td>
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<tr>
<td>0</td>
<td>Through Level</td>
<td>Mercury</td>
<td>Fluorescent Light Tubes</td>
<td>N/A</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<tr>
<td>0</td>
<td>Room E029</td>
<td>Radioactive Materials</td>
<td>Diagnostic Equipment</td>
<td>N/A</td>
<td>Good Condition</td>
<td>GE Medical Systems</td>
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<td>C</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<tr>
<td>0</td>
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<td>Silica</td>
<td>Concrete, Mortar, etc.</td>
<td>N/A</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
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<td>Manage in Place</td>
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<tr>
<td>0</td>
<td>Room E041</td>
<td>Ozone Depleting Substances (ODS)</td>
<td>Air Conditioning Unit</td>
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<td>Good Condition</td>
<td>Climate-Master</td>
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<tr>
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<td>Room E042</td>
<td>Ozone Depleting Substances (ODS)</td>
<td>Air Conditioning Unit</td>
<td>N/A</td>
<td>Good Condition</td>
<td>Keep-Rite</td>
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<tr>
<td>0</td>
<td>Room E043</td>
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<td>Air Conditioning Unit</td>
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<td>Good Condition</td>
<td>Norbec</td>
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<td>LumaCell</td>
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<td>A133</td>
<td>Lead</td>
<td>Battery Pack</td>
<td>N/A</td>
<td>Good Condition</td>
<td>LumaCell</td>
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<td>C</td>
<td>Confirmed</td>
<td>Manage In Place</td>
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<td>Room A139</td>
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<td>Paint</td>
<td>White</td>
<td>Good Condition</td>
<td>N/A</td>
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<tr>
<td>1</td>
<td>Throughout Level</td>
<td>Lead</td>
<td>Paint</td>
<td>Beige</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
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<td>Manage in Place</td>
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<tr>
<td>1</td>
<td>Room A129</td>
<td>Ozone Depleting Substances (ODS)</td>
<td>Ice Making Machine</td>
<td>N/A</td>
<td>Good Condition</td>
<td>Manitowoc</td>
<td>1</td>
<td>C</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<td>1</td>
<td>Throughout Level</td>
<td>Mercury</td>
<td>Fluorescent Light Tubes</td>
<td>N/A</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<tr>
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<td>Throughout Level</td>
<td>Silica</td>
<td>Concrete, Mortar, etc.</td>
<td>N/A</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
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<td>1</td>
<td>Room A129</td>
<td>Ozone Depleting Substances (ODS)</td>
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<td>N/A</td>
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<td>E255A</td>
<td>Ozone Depleting Substances (ODS)</td>
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<td>Thermo-Scientific</td>
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<td>Manage In Place</td>
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<td>2</td>
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<td>Lead</td>
<td>Paint</td>
<td>White</td>
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<td>-</td>
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<td>Manage in Place</td>
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<td>Lead</td>
<td>Paint</td>
<td>Green</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>Confirmed</td>
<td>Manage In Place</td>
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### Appendix D - Hazardous Containing Materials Checklist

<table>
<thead>
<tr>
<th>Floor/Level</th>
<th>Location</th>
<th>Type</th>
<th>Component</th>
<th>Colour</th>
<th>Condition</th>
<th>Manufacturer</th>
<th>Quantity #</th>
<th>Unit</th>
<th>Suspected/Confirmed</th>
<th>Recommended Action</th>
<th>Comments</th>
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<tr>
<td>2</td>
<td>E255</td>
<td>Ozone Depleting Substances (ODS)</td>
<td>Ice Making Machine</td>
<td>N/A</td>
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<td>Manage in Place</td>
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<td>2</td>
<td>Throughout Level</td>
<td>Mercury</td>
<td>Fluorescent Light Tubes</td>
<td>N/A</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<tr>
<td>2</td>
<td>Throughout Level</td>
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<td>Concrete, Mortar, Etc.</td>
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<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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</tr>
<tr>
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<td>Throughout Level</td>
<td>Lead</td>
<td>Battery Pack</td>
<td>N/A</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<tr>
<td>2</td>
<td>Throughout Level</td>
<td>Ozone Depleting Substances (ODS)</td>
<td>Ice Making Machine</td>
<td>N/A</td>
<td>Good Condition</td>
<td>Hoshizaki</td>
<td>1</td>
<td>C</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<td>E301</td>
<td>Lead</td>
<td>Battery Pack</td>
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<td>Good Condition</td>
<td>N/A</td>
<td>1</td>
<td>C</td>
<td>Confirmed</td>
<td>Manage In Place</td>
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<tr>
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<td>Throughout Level</td>
<td>Mercury</td>
<td>Fluorescent Light Tubes</td>
<td>N/A</td>
<td>Good Condition</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<td>3</td>
<td>Throughout Level</td>
<td>Silica</td>
<td>Concrete, Mortar, Etc.</td>
<td>N/A</td>
<td>Good Condition</td>
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<td>-</td>
<td>N/A</td>
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<tr>
<td>3</td>
<td>Throughout Level</td>
<td>Lead</td>
<td>Battery Pack</td>
<td>N/A</td>
<td>Good Condition</td>
<td>Various</td>
<td>-</td>
<td>N/A</td>
<td>Confirmed</td>
<td>Manage in Place</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX E:
Drawings
NOTE: ALL SOFFIT PLASTER AND SOFFIT CAULKING IS CONSIDERED TO BE ASBESTOS-CONTAINING
NOTE: ALL SOFFIT PLASTER AND SOFFIT CAULKING IS CONSIDERED TO BE ASBESTOS-CONTAINING
NOTE: ALL SOFFIT PLASTER AND SOFFIT CAULKING IS CONSIDERED TO BE ASBESTOS-CONTAINING
LEVEL 3 FLOOR PLAN, 200 LEES AVENUE

NOTE: ALL SOFFIT PLASTER AND SOFFIT CAULKING IS CONSIDERED TO BE ASBESTOS-CONTAINING

LEGEND

ASBESTOS-CONTAINING SOFFIT PLASTER AND SOFFIT CAULKING