

HAZARDOUS MATERIALS SURVEY AND 2022 REASSESSMENT POWER PLANT - 720 KING EDWARD AVENUE, OTTAWA, ON



Project No.: OZ2021101HZ / CCC-230252-00

Prepared for:

University of Ottawa

Prepared by:

McIntosh Perry Limited (MPL)

MPL Contact:

John Tufts, Project Manager

Hazardous Materials / Environmental Health & Safety

T: 613-836-2184 E: j.tufts@mcintoshperry.com

Date:

January 6, 2023

McINTOSH PERRY

TABLE OF CONTENTS

REASSESSMENT SURVEY 2022.....	I
EXECUTIVE SUMMARY	II
1.0 INTRODUCTION	1
2.0 PROPERTY DESCRIPTION	2
3.0 FINDINGS & RECOMMENDATIONS.....	2
<i>Designated Substances</i>	2
3.1 <i>Asbestos</i>	2
3.1.1 Fireproofing.....	3
3.1.2 Mechanical Pipe Insulation	4
3.1.3 Flexible Duct Connector	4
3.1.4 Heat Shield or Heat Shield Insulation	4
3.1.5 Texture Finishes.....	4
3.1.6 Plaster	4
3.1.7 Drywall Joint Compound	4
3.1.8 Ceiling Tiles.....	5
3.1.9 Vinyl Floor Tiles.....	5
3.1.10 Vinyl Sheet Flooring	5
3.1.11 Brick/Stone Mortar	5
3.1.12 Concrete Block Mortar	5
3.1.13 Ceramic Wall / Floor Tile Grout	5
3.1.14 Transite (Asbestos Cement)	5
3.1.15 Caulking.....	5
3.1.16 Mastic.....	6
3.1.17 Cementitious Coating.....	6
3.1.18 Fire Doors	6
3.1.19 Roofing Material	6
3.2 <i>Lead</i>	7
3.2.1 Paint Finishes.....	7

3.2.2	Battery Packs	8
3.3	Mercury.....	9
3.4	Silica.....	9
	<i>Other Hazardous Materials</i>	11
3.5	Polychlorinated Biphenyls (PCBs)	11
3.5.1	Light Ballasts.....	11
3.5.2	Transformers	11
3.6	Ozone Depleting Substances (ODSs) and Other Halocarbon.....	11
3.7	Radioactive Materials	11
3.8	Underground and Above Ground Storage Tanks (USTs and ASTs).....	12
3.9	Mould.....	12
3.9.1	Mould	12
3.9.2	Water Damage.....	12
4.0	GENERAL CONSIDERATIONS AND LIMITATIONS.....	13

Appendix A – Regulatory Requirements

Appendix B – Survey Methodology & Background Information

Appendix C – Laboratory Certificate of Analysis

Appendix D– Site Photographs

Appendix E – Asbestos Containing Materials Checklist

Appendix F – Hazardous Containing Materials Checklist

Appendix G – Site Sampling & Location Plans

REASSESSMENT SURVEY 2022

McIntosh Perry Limited (MPL) was retained by the University of Ottawa, to complete to a hazardous materials survey of Marchand Residence located at 720 King Edward Avenue, Ottawa, Ontario. The survey was conducted on August 26th, 2020. The reassessment was completed on June 29th, 2022.

The purpose of the reassessment was to evaluate the condition and quantity of previously reported asbestos-containing materials (ACM) and develop corrective action plans as required for the purposes of long-term management.

The assessment and reassessment determined the following findings and recommendations.

Summary of the Reassessment Findings:

- ACM Ceiling Texture Finish was observed to be in Good Condition in Rooms M03 and M10 of the subject building.
- ACM Mechanical Pipe Fitting/Elbow Insulation was observed to be in Good Condition throughout the subject building.
- ACM Exhaust Pipe Insulation – White was observed to be in Good Condition in Room M09 of the subject building.
- ACM Vinyl Floor Tile (VFT) was observed to be in Good Condition in Room M12 of the subject building.
- ACM Grout was observed to be in Good Condition in Room 003 of the subject building.
- ACM Refractory Cement was observed to be in Good and Poor Condition inside the chimney of the subject building.
- Water damaged materials were observed in select locations during the site survey.
- No mould affected materials were observed during the site survey.

Summary of Recommendations:

- Perform a reassessment of asbestos materials on an annual basis.
- Perform a pre-construction assessment and remove all asbestos-containing materials (ACM) prior to alterations or maintenance work if ACM may be disturbed by the work.
- Follow appropriate safe work procedures when handling or disturbing asbestos.
- Sample any presumed ACM prior to alteration or maintained work if presumed ACM may be disturbed by the work.

EXECUTIVE SUMMARY

McIntosh Perry Limited (MPL) was retained by the University of Ottawa, to complete a hazardous materials survey for the building located at 720 King Edward Avenue. The survey was conducted on August 26th, 2020. The Reassessment Survey was completed on June 29th, 2022.

The purpose of the survey was to determine the presence of building materials containing Designated Substances and other hazardous materials, as defined under the Ontario Occupational Health and Safety Act. Designated Substances are eleven chemical agents prescribed under Ontario Regulation 490/09.

Based on the assessment conducted by MPL, the following ACMs were identified or suspected to be present in the building:

Table A: Summary of Asbestos-Containing Materials Identified

Material Description	Friable?	Location	Type of Asbestos
Ceiling Texture	Friable	Specific Areas Only	Chrysotile
Vinyl Floor Tile	Non-Friable	Specific Areas Only	Chrysotile
Grout	Non-Friable	Specific Areas Only	Chrysotile
Refractory Cement	Friable	Specific Areas Only	Chrysotile
Mechanical Insulation – Grey	Friable	Throughout	Chrysotile
Exhaust Pipe Insulation – White	Friable	Throughout	Chrysotile
Brick Mortar	Non-Friable-	Specific Areas Only	Suspected
Concrete Block Mortar	Non-Friable	Specific Areas Only	Suspected

Note: Please refer to the complete report for specific details and recommendations.

All repairs or removal of asbestos-containing materials must be conducted according to Ontario Regulation 278/05, Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act. Asbestos containing waste must also be handled and disposed of according to Ontario Regulation 347/90 as amended – made under the Environmental Protection Act. 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;

Sub-trades working with or in close proximity to asbestos-containing material should be informed of its presence;

Given that asbestos containing materials (ACMs) have been identified and will likely remain in place, an Asbestos Management Plan (AMP) is therefore 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 and as may be required based on expected changing site conditions, abatement and/or renovation activities.

Based on the assessment conducted by MPL, the following Designated Substances were identified or suspected to be present in the building:

Table B: Summary of Designated Substances & Hazardous Materials Identified

Material Description	Location
Lead Paint	Specific Areas Only
Mercury Vapour	Specific Equipment
Silica	Throughout Building

Note: Please refer to the complete report for specific details and recommendations.

Designated Substances are regulated under Ontario Regulation 490/09 — Designated Substances, made under the Ontario Health and Safety Act, which applies to controlling designated substances in the workplace.

In addition to Ontario Regulation 490/09, the following guidelines must also be adhered to when conducting work activities that involve disturbance of the above-mentioned materials:

- Guideline: Lead on Construction Projects, issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour
- Guideline: Silica on Construction Projects issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour.
- Environmental Abatement Council of Canada (EACC) Lead Abatement Guidelines.

Prior to any renovations or demolition activities within building, designated substances must be decommissioned by a licensed contractor such that they are contained and not released to the environment during decommissioning as per O. Reg. 347/09- made under the Environmental Protection Act.

Any suspect building materials encountered that were not assessed as part of this survey, should be assumed to contain designated substances or hazardous materials until proven otherwise by analytical testing.

This report should be made available to contractors tendering on any renovation or demolition work. In turn, all contractors requesting tenders from subcontractors shall furnish this report to subcontractors.

This executive summary is not to be used alone. This report should be reviewed in its entirety.

McINTOSH PERRY

January 6, 2023

University of Ottawa
141 Louis-Pasteur Private
Ottawa, Ontario
K1N 1E3

via email: joel.lajeunesse@uottawa.ca

Attention: Joel Lajeunesse, Project Manager

Re: 720 King Edward Avenue, Ottawa, Ontario
Hazardous Materials Survey
McIntosh Perry Limited Reference No. Z2021101HZ / CCC-230252-00

1.0 INTRODUCTION

In accordance with your instructions, McIntosh Perry Limited (MPL) carried out a Hazardous Materials Survey at the Power Plant building located at 720 King Edward Avenue, Ottawa, Ontario. The survey of the building was conducted on August 26, 2020. The Reassessment Survey was completed on June 29th, 2022.

The purpose of the survey was to determine the presence of building materials containing Designated Substances and other hazardous materials, as defined under the Ontario Occupational Health and Safety Act. Designated Substances are eleven chemical agents prescribed under Ontario Regulation 490/09. In addition, a visual assessment was conducted for the presence of polychlorinated biphenyls (PCBs), radioactive materials, ozone depleting substances (ODSs), other halocarbons and mould.

MPL completed the following,

- Visual review of the building to identify materials which could contain Designated Substances and hazardous materials;
- Bulk sampling and analysis of building materials suspected of containing asbestos (if required);
- Bulk sampling and analysis of representative paints and finishes suspected of containing lead (if required);
- Review of previously completed Hazardous Materials Survey(s) and historical building record(s); and,
- Recommendations for appropriate action where required.

2.0 PROPERTY DESCRIPTION

The Site is the central mechanical facility for the entire main campus of the University of Ottawa. It acts as the central heating, cooling, ventilation, and electrical mechanical control centre for the campus. The building was constructed and officially opened in 1972. The building comprises approximately 2,926 square meters in one main floor and a large mezzanine.

The building is constructed of concrete including exterior walls, roof deck and floor slabs. The exterior of the building is finished with brick. The building has a tar and gravel roof. The interior of the building is comprised of concrete including concrete walls and floors with some the exception of some vinyl floor tiles.

3.0 FINDINGS & RECOMMENDATIONS

Designated Substances

3.1 Asbestos

Findings

A total of sixteen (16) bulk samples were collected during the survey and sent to an accredited laboratory for analysis. A summary of potential asbestos-containing samples collected along with the sample location, type and friability are presented in Table 1.

Laboratory certificates of analysis for asbestos are included in Appendix C.

Table 1:
 Asbestos Laboratory Results

Sample ID	Location	Material	Type and Content	Friability
1.1	Room M10	Ceiling Texture – White	2% Chrysotile	Yes
1.2	Room M10	Ceiling Texture – White	Stop Positive - Sample Not Analyzed	Yes
1.3	Room M03	Ceiling Texture – White	Stop Positive - Sample Not Analyzed	Yes
2.1	Room M12	VFT (12"x12" – Beige w/ Grey Streaks)	2% Chrysotile	Non- Friable
		Mastic (Black)	None Detected	N/A
2.2	Room M12	VFT (12"x12" – Beige w/ Grey Streaks)	Stop Positive - Sample Not Analyzed	Non- Friable
		Mastic (Black)	None Detected	N/A

Sample ID	Location	Material	Type and Content	Friability
2.3	Room M12	VFT (12"x12" – Beige w/ Grey Streaks)	Stop Positive - Sample Not Analyzed	Yes
		Mastic (Black)	None Detected	N/A
3.1	Room M006	VFT (12"x12" – White w/ Grey Mix)	None Detected	N/A
		Mastic (Black)	None Detected	N/A
3.2	Room M006	VFT (12"x12" – White w/ Grey Mix)	None Detected	N/A
		Mastic (Black)	None Detected	N/A
3.3	Room M006A	VFT (12"x12" – White w/ Grey Mix)	None Detected	N/A
		Mastic (Black)	None Detected	N/A
4.1	Room M13	Drywall Joint Compound	None Detected	N/A
4.2	Room M13	Drywall Joint Compound	None Detected	N/A
4.3	Room M13	Drywall Joint Compound	None Detected	N/A
4.4	Room M13	Drywall Joint Compound	None Detected	N/A
5.1	Room 003	Grout	Chrysotile	Non- Friable
5.2	Room 003	Grout	Stop Positive - Sample Not Analyzed	Non- Friable
5.3	Room 003	Grout	Stop Positive - Sample Not Analyzed	Non- Friable
Previously Identified Asbestos-Containing Material				
141-ABS-01 (A-C)	M13A	Refractory Cement	Chrysotile	Yes
141-ASB-02 (A-C)	M09	Exhaust Pipe Insulation – Grey	Chrysotile	Yes
141-ASB-03 (A-C)	M09	Exhaust Pipe Insulation – White	Chrysotile	Yes

N/A – Not Applicable

VFT – Vinyl Floor Tiles

Stop Positive – Material considered being asbestos-containing as per O. Reg. 278/05.

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

The following building materials (if present) were investigated for asbestos content:

3.1.1 Fireproofing

No fireproofing was observed in the subject building.

3.1.2 Mechanical Pipe Insulation

A mix of suspect asbestos-containing and non asbestos containing fibreglass insulation was observed throughout the power plant. Where possible, fittings and pipe insulation were assessed by squeezing and pressing on the insulation to determine composition as both fibreglass and ACM fittings are jacketed in fibreglass and cannot visually be assessed. Quantities of assessed fittings and straights have been quantified by Zone (shown in Appendices E and G). Due to the sheer quantity of fittings in the power plant and difficulty of access, fittings should be assessed individually prior to disturbance to determine asbestos precautions (or lack thereof) necessary.

3.1.2.1 Mechanical Pipe Straight Insulation

Previously identified asbestos-containing exhaust pipe insulation was observed in Room M09. This material contains 55% Chrysotile asbestos. This material is considered friable and was observed in good condition.

Previously identified asbestos-containing refractory cement inside the chimney. This material contains 3% Chrysotile asbestos. This material is considered friable and was observed in good condition, with select locations observed to be in poor condition during the 2022 Reassessment.

3.1.2.2 Mechanical Piping Elbows/Fittings/Hangers Insulation

Previously identified asbestos-containing piping elbows and fittings insulation was observed throughout the main power plant. This material contains between 5 and 50% chrysotile and is considered friable.

3.1.3 Flexible Duct Connector

No flexible duct connectors were observed in the subject building.

3.1.4 Heat Shield or Heat Shield Insulation

No potential asbestos-containing heat shield insulation were observed in the subject building.

3.1.5 Texture Finishes

Ceiling texture coat (White) was observed and sampled in Rooms M03 and M10. This material contains 2% Chrysotile asbestos. This material is considered friable and was observed in good condition.

3.1.6 Plaster

No wall and ceiling plaster were observed and in the subject building.

3.1.7 Drywall Joint Compound

Drywall joint compound was observed and sampled in Room M13. The laboratory analytical results of the samples collected does not contain asbestos.

3.1.8 Ceiling Tiles

No ceiling tiles were observed in the subject building.

3.1.9 Vinyl Floor Tiles

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

- Vinyl floor tiles (12" x 12" – Beige w/ Grey Streaks) were observed and sampled in Room M12. This material contains 2% Chrysotile asbestos. This material is considered non-friable and was observed in good condition. The associated mastic (Black) was determined not to contain asbestos.
- Vinyl floor tiles (12" x 12" – White w/ Grey Mix) were observed and sampled in Room M006. The laboratory analytical results of the samples collected indicate that this material does not contain asbestos. The associated mastic (Black) was also determined not to contain asbestos.

3.1.10 Vinyl Sheet Flooring

No vinyl sheet flooring was observed in the subject building.

3.1.11 Brick/Stone Mortar

To avoid damage and compromising the integrity of the structure, no bulk samples of the brick mortar were collected. Prior to renovation/demolition, brick mortar should be examined and tested for asbestos content. Brick mortar should therefore be considered to contain asbestos until bulk samples and analysis proves otherwise.

3.1.12 Concrete Block Mortar

To avoid damage and compromising the integrity of the structure, no bulk samples of the concrete block mortar were collected. Prior to renovation/demolition, concrete block mortar should be examined and tested for asbestos content. Concrete block mortar should therefore be considered to contain asbestos until bulk samples and analysis proves otherwise.

3.1.13 Ceramic Wall / Floor Tile Grout

Wall grout (Grey) was observed and sampled in Room 003. This material contains 1% Chrysotile asbestos. This material is considered non-friable and was observed in good condition

3.1.14 Transite (Asbestos Cement)

No transite materials were observed in the subject building.

3.1.15 Caulking

No caulking materials were observed in the subject building.

3.1.16 Mastic

No mastic materials were observed in the subject building.

3.1.17 Cementitious Coating

No cementitious coating finishes were observed in the subject building.

3.1.18 Fire Doors

No fire doors were observed within the subject building.

3.1.19 Roofing Material

No roofing materials (Shingles & Tar) were observed within the subject building.

Recommendations

- Asbestos-containing materials identified to be in poor condition must be repaired/removed immediately, following Type 1/2/3 asbestos abatement work procedures as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Materials identified to contain asbestos that are in good condition and do not pose a risk to workers or occupants can be managed in place. Prior to renovation/demolition activities that may disturb the ACMs, these materials must be removed following appropriate Type 1/2/3 asbestos abatement work procedures as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Please refer to Appendix E – Asbestos-Containing Materials Checklist for material conditions, quantities (where applicable), and recommended actions;
- Prior to renovation/demolition of materials which are assumed to be asbestos-containing (suspect materials which were not sampled, i.e., concrete block mortar), these materials must either be tested for asbestos content or removed following appropriate asbestos abatement work procedures (Type 1/2/3) as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- All repairs or removal of asbestos-containing materials must be conducted according to Ontario Regulation 278/05, Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act. Asbestos containing waste must also be handled and disposed of according to Ontario Regulation 347/90 as amended – made under the Environmental Protection Act. 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;
- Sub-trades working with or in close proximity to asbestos-containing material should be informed of its presence; and

- Given that asbestos containing materials (ACMs) have been identified and will likely remain in place, an Asbestos Management Plan (AMP) is therefore 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 and as may be required based on expected changing site conditions, abatement and/or renovation activities.

3.2 Lead

Findings

3.2.1 Paint Finishes

A total of five (5) paint samples from the subject building were collected and analyzed for lead content. Results of bulk sampling testing are summarized in Table 2 and the laboratory certificate of analysis can be found in Appendix C.

Table 2:

Lead Sampling Locations and Laboratory Results

Sample I.D.	Location	Material	Colour	Lead Concentration Weight by Conc. (%)
PB 1	Room M13	Wall Paint	White	0.16
PB 2	Room 003	Floor Paint	Grey	0.096
PB 3	Room 003	Floor Paint	Red	<0.0080
PB 4	Room 003	Column Paint	White	0.015
PB 5	Room M13B	Floor Paint	Beige	0.030
PB 6	Room M09	Wall Paint	Grey	0.27
Previously Identified Lead Paint				
141-LP-01	M09	Boiler Exhaust Piping	Orange	0.27
141-LP-02	M09	Boiler Exhaust Piping	Dark Orange	<0.0083
141-LP-03	-	Wall Paint	Olive	<0.0080

The paint finishes highlighted in blue in the above table were determined to contain low concentrations of lead which are less than or equal to 0.1%. These paint finishes were observed to be in good condition.

The paint finishes highlighted in pink in the above table are considered lead-containing paints or surface coatings with concentrations greater than 0.1% lead by weight. These paint finishes were observed to be in good condition, with the exception of select areas which were observed in poor condition.

All other paints throughout the subject building that are not mentioned in this report must be considered to be lead-containing unless sampling and analysis proves otherwise.

3.2.2 Battery Packs

MPL did not identify any lead-containing acid battery packs within the subject 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.

Recommendations

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 OMOL "Lead on Construction Project" dated April 2011.

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.

Detailed worker protection protocols are outlined in the OMOL Guideline "Lead on Construction Projects" dated April 2011. Generally, the removal of the lead-based paint with the use of a chemical gel or paste, or a power tool equipped with a HEPA filter is considered a Type 1 operation. The removal of lead-based paint by scraping or sanding using non-powered hand tools is considered a Type 2 operation. The removal of lead-based paint using abrasive blasting, or power tools without a HEPA filter, is considered a Type 3 operation, and requires the most stringent worker protection protocols (similar to asbestos); Furthermore, high temperature cutting or welding would also require Type 3 Operations under the Guideline for Lead on Construction Projects. If this type of work is required, it may be prudent to chemically remove the lead paint in selected locations prior to performing any high temperature cutting or welding.

All lead materials that are removed must follow the Ministry of Labour and Environmental Abatement Council of Ontario Lead Guidelines.

Please refer to Appendix F – Hazardous Materials Checklist for material conditions, quantities (where applicable), and recommended actions.

Precautions should be taken as required during major renovations and demolition projects to ensure that workers' exposure levels to airborne lead does not exceed 0.05 mg/m³. This can be achieved by:

- providing workers with proper training;
- providing the workers with respiratory protection;
- wetting the surface of the materials to prevent dust emissions; and,
- providing workers with hygiene facilities to properly wash prior to exiting the work area.

Sub-trades working with or in close proximity to lead based paint should be informed of its presence.

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.

3.3 Mercury

Findings

Based on observations of the Site there is a high probability that mercury is present in a limited number of the thermostats and thermometers observed throughout the Site. Several thermometers, which may contain mercury, were observed in rooms 003, M09, M13, and M13C. Mercury in the form of vapour is also present in the fluorescent light fixtures found throughout the building.

Recommendations

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

3.4 Silica

Findings

Silica is expected to be present in building materials such as concrete, brick, mortar and ceramic tiles located throughout the structures. Free crystalline silica (α -Quartz) may be a component in ceiling tiles and gypsum board. Silica (including free crystalline silica) may also be a component of concrete and brick surfaces noted in the building.

Recommendations

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

Precautions should be taken as required during major renovations and demolition projects on concrete (i.e. coring through concrete slabs, demolition of masonry, etc.) to ensure that workers' exposure levels to airborne silica does not exceed 0.05 mg/m³.

This can be achieved by:

- providing workers with proper training;
- providing the workers with respiratory protection;
- wetting the surface of the materials to prevent dust emissions; and,
- providing workers with facilities to properly wash prior to exiting the work area.

Demolition work that is likely to impact silica-containing materials should be carried out in accordance with the requirement detailed in the Ontario Ministry of Labour document entitled "Guideline: Silica on Construction Projects", dated April 2011.

Other Hazardous Materials

3.5 Polychlorinated Biphenyls (PCBs)

Findings

3.5.1 *Light Ballasts*

The subject building is illuminated by LED and fluorescent lights. MPL assessed representative ballasts in the building, and these ballasts were identified as non-PCBs content.

3.5.2 *Transformers*

MPL did not observe any PCBs containing electrical transformers within the subject building. Transformers that could be assessed were observed to be dry-type and manufactured by Hammond Manufacturing.

Recommendations

Please refer to Appendix F – Hazardous Materials Checklist for material conditions, quantities (where applicable) and recommended actions.

Prior to any renovations, all light ballasts and electrical wires containing or suspected of containing PCBs that will be affected by the work, must be decommissioned by a licensed contractor such that PCBs are contained and not released to the environment during decommissioning and properly disposed of in accordance with R.R.O. 1990, Regulation 347 General – Waste Management, made under the Environmental Protection Act.

3.6 Ozone Depleting Substances (ODSs) and Other Halocarbon

Findings

A visual assessment for equipment potentially containing ODSs and other halocarbons was conducted. Equipment containing ODSs or other halocarbons was observed in the subject building.

Recommendations

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

Under the management of a licensed contractor, equipment containing R-134a 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.

3.7 Radioactive Materials

Findings

MPL did not observe any electrical components containing radioactive materials.

Recommendations

Since no radioactive materials were observed or suspected to be present during the site survey, no further action is required.

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

Findings

A visual survey of the subject building was conducted to determine if any USTs and ASTs were present. No USTs and ASTs were present within the subject building.

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.

3.9 Mould

Findings

3.9.1 Mould

A visual survey of the subject building was conducted to determine if any mould was present. MPL did not identify any areas with mould growth.

3.9.2 Water Damage

A visual survey of the subject building was conducted to determine if any water damaged was present. MPL did not identify any areas throughout the subject building, where materials were affected by water damage.

Recommendations

Since no mould or water damaged building materials were observed to be present during the site survey, no further action is required.

This report should be made available to contractors tendering on any renovation or demolition work. In turn, all contractors requesting tenders from subcontractors shall furnish this report to subcontractors

4.0 GENERAL CONSIDERATIONS AND LIMITATIONS

The information presented in this report is based on information provided by others, direct visual observation made by personnel with McIntosh Perry Limited (MPL), and the results of laboratory testing as identified herein.

It should be noted that there might be hazardous materials in locations not visible during our investigation. In the event such material is encountered during demolition operations in the building, this material should be tested and dealt with accordingly.

The findings detailed in this report are based upon the information available at the time of preparation of the report. No investigative method eliminates the possibility of obtaining imprecise or incomplete information. Professional judgement was exercised in gathering and analyzing the information obtained and in the formulation of our conclusions and recommendations.

MPL does not certify or warrant the environmental status of the property nor the building on the property.

Please note that the passage of time affects the information provided in the report. Environmental conditions of a site can change. Opinions relating to the site conditions are based upon information that existed at the time that the conclusions were formulated.

The client expressly agrees that it has entered into this agreement with MPL, both on its own behalf and as agent on behalf of its employees and principals.

The client expressly agrees that MPL's employees and principals shall have no personal liability to the client in respect of a claim, whether in contract, tort and/or any other cause of action in law. Accordingly, the client expressly agrees that it will bring no proceedings and take no action in any court of law against any of MPL's employees or principals in their personal capacity.

We trust that we have detailed our findings clearly and that we have satisfactorily addressed the scope of work you require at this time. In the event you wish us to review our findings with you, or require our services further in this regard, please do not hesitate to contact our office.

Yours truly,

MCINTOSH PERRY LIMITED



John Tufts, B.Sc.
Project Manager
Hazardous Materials/ Environmental Health & Safety



Mario Morana, A.Sc.T.
Manager
Hazardous Materials/ Environmental Health & Safety

APPENDIX A

Regulatory Requirements

REGULATORY REQUIREMENTS

In Ontario, there is a total of eleven Designated Substances. These substances have been regulated under Ontario Regulation 490/09 — *Designated Substances*, made under the Ontario Health and Safety Act, which applies to controlling designated substances in the workplace.

In addition to the Ontario Regulation 490/09 noted above, the following were observed for this survey:

Guideline: Lead on Construction Projects, issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour

Guideline: Silica on Construction Projects issued April 2011 by the Occupational Health and Safety branch of the Ministry of Labour.

The Occupational Health and Safety Act (OHSA), R.S.O. 1990, c.0.1, s.30 (1) specifies that: “Before beginning a project, the owner shall determine whether any Designated Substances are present at the project site and shall prepare a list of all Designated Substances that are present at the site.

Section 30 of The Act requires that the list of Designated Substances be provided to prospective contractors and subcontractors who may do work on a site and come into contact at the site with Designated Substances.

The Ministry of Labour has designated the following substances:

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

Ontario Regulation 278/05 (O. Reg. 278/05), the Regulation respecting Asbestos on Construction Projects and in Buildings and Repair Operations, made under the Occupational Health and Safety Act (OHSA), requires owners of a building to identify Asbestos-containing Materials (ACMs) prior to potential disturbance of the materials.

In addition, an owner of a building is required to have an Asbestos Management Plan (AMP) if ACMs (friable or non-friable) are present in the building and are to remain in place. 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 and as may be required based on expected changing site conditions, abatement and/or renovation activities. Removal of all asbestos-containing materials is required prior to building demolition.

In addition to the Designated Substances, the building was also surveyed for the presence of other hazardous materials such as polychlorinated biphenyls (PCBs), radioactive materials, ozone depleting substances (ODSs), other halocarbons, and mould.

We understand that this survey has been conducted to comply with the regulatory requirements of Ontario Regulation 278/05.

APPENDIX B

Survey Methodology & Background Information

SURVEY METHODOLOGY

For the purpose of this survey, not all Designated Substances or suspect hazardous material were sampled. Selective sampling was carried out only for substances that were suspected to be present or those deemed to have a likely source of origin in the survey areas.

Materials that were homogeneous in nature and/or similar in appearance to other materials tested were considered to be of similar composition. The likelihood of ACMs being present in inaccessible areas such as above gypsum board ceilings or behind gypsum wallboards was determined by assessing the presence of asbestos-containing systems in adjacent areas. Equipment such as boilers, motors, blowers, electrical panels, fire doors etc., were not de-energized or disassembled to examine internal components or materials. These items should be considered to contain hazardous materials until proven otherwise.

During the survey, representative samples of suspect building materials were collected and sent to CAELA accredited independent laboratory for analysis. Laboratory Certificate of Analysis are attached in Appendix C.

Other potential hazardous materials were identified by visual observation and/or by reviewing Material Safety Data Sheets (MSDS) and/or safety labels where available.

Investigated Areas

The survey included all accessible areas and ceiling space within 157 Seraphin Marion Private as required under our scope of work. No destructive investigations were performed as part of this survey. Photographs of the areas investigated can be found in Appendix D.

The assessment was directed on the interior structure and finishes of the building. It did not consider current or past owner or occupant articles within the building (i.e. contents, furniture, etc.) and does not report on possible contaminants in the soil under and surrounding the building, or contents of vessels, drums, etc. that may be concealed.

Sampling and Assessment Methodologies

Sampling was conducted as part of this assessment. Results for asbestos and lead samples can be found in the Findings & Recommendation Section 3.0.

A historical review of previous designated substance survey reports and abatement reports was examined as part of this survey. Due to concerns regarding certain historical analytical results, mainly in 2008 and prior years, confirmatory re-sampling was conducted for selected materials previously identified not to contain asbestos. However, building materials previously identified to be asbestos-containing were not re-sampled. The reports are listed as follows,

- Designated Substance Inventory, 155-157 Seraphin Marion, Ottawa, Ontario, prepared by Conestoga-Rovers & Associates (dated April 2008, reference # 045870 (20));
- Pre-Construction Asbestos Material Assessment, 155-157 Seraphin Marion, Ottawa, Ontario, prepared by EHS (dated January 21, 2014, reference # 04-0033-14-002); and,
- Potential Asbestos Containing Plaster Assessment, 155-157 Seraphin Marion, Ottawa, Ontario, prepared by EHS (dated August 14, 2014, reference # 04-0033-14-023).

Asbestos

Background Information on Asbestos

Asbestos is a generic name that has been given to a group of naturally occurring fibrous minerals. In the past, asbestos was commonly used as a component in building materials such as insulation, fireproofing and acoustic or decorative panels. Although there are many types of asbestos, the three main forms of commercial importance in Ontario are chrysotile, amosite and crocidolite.

An Asbestos-Containing Material (ACM) is defined by O. Reg. 278/05 as a material that contains 0.5% or more asbestos by dry weight. ACMs are placed into two general classes, "friable" and "non-friable" ACMs. Friable ACMs are those materials that when dry can be crumbled, pulverized and reduced to powder by hand pressure. Typical friable ACMs include acoustical or decorative texture coats, fireproofing and thermal insulation. Non-friable ACMs are much more durable as they are held together by a binder such as cement, vinyl or asphalt. Typical non-friable ACMs include floor tiles, fire blankets, roofing materials and cementitious products such as wallboards, pipes or siding.

It has been recognized that hazardous situations may exist in buildings where asbestos-containing materials are found. This is especially true where asbestos fibres may become airborne as a result of material ageing, physical damage, and water damage or air movement.

In contrast, there is little reason for concern if the asbestos is in good condition, has not been damaged and is not in a location where it is likely to be disturbed.

Asbestos Survey Methodology

The asbestos survey included the identification of potential friable and non-friable asbestos-containing materials within the surveyed areas of the subject building.

The likelihood of ACMs being present in inaccessible areas such as above gypsum wallboard ceilings and walls was determined by assessing the presence of asbestos-containing materials in adjacent areas.

Fiberglass insulation was not submitted for analysis as it can be identified visually as non-asbestos material.

Building materials suspected of containing asbestos were identified and representative sampling and laboratory testing of these materials was conducted. The number of bulk material samples collected from a homogeneous area was in accordance with Table 1. O. Reg. 278/05 s. 3 (3) below. Building materials suspected of containing asbestos were collected using wetting techniques and hand sampling tools.

Table 1 - O. Reg. 278/05 s. 3(3): Minimum Asbestos Bulk Material Sample Requirements

Item	Type of material	Size of area of homogeneous material	Minimum number of bulk material samples to be collected
1.	Surfacing material, including without limitation, material that is applied to surfaces by spraying, by troweling or	Less than 90 square metres	3
		90 or more square metres, but less than 450 square metres	5

	otherwise, such as acoustical plaster on ceilings and fireproofing materials on structural members	450 or more square metres	7
2.	Thermal insulation, except as described in item 3	any size	3
3.	Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
4.	Other material	Any size	3

Preliminary identification of the samples was made using polarized light microscopy (PLM), with confirmation of presence and type of asbestos made by dispersion staining optical microscopy. This analytical procedure follows the U.S. Environmental Protection Agency Test Method EPA/600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials, June 1993.

All bulk samples were analysed for asbestos content by EMSL Canada Inc. (EMSL), an independent laboratory. EMSL is an independent laboratory accredited by National Institute of Standards and Technology/National Voluntary Laboratory Accreditation (NIST/NVLAP) (Lab Code #200877-0).

Vinyl floors tiles were analyzed using the phase light microscopy (PLM) method of analysis. However, given the composition of vinyl floor products, the PLM analysis method may be prone to yielding false negative analytical results. Therefore, prior to removal or replacement, vinyl floor products previously identified to be negative, should undergo additional analysis by Transmission Electron Microscopy (TEM) to confirm asbestos content, if any.

Materials identified to contain asbestos were assessed on the relative possibility of fibre release into the air due to a combination of their condition and accessibility.

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.

Note: The above evaluation criteria was also applied to other hazardous materials where applicable. Please refer to the Asbestos and Hazardous Materials Checklist in Appendix E & F for further details.

Lead

Background Information on Lead

Lead was a common additive in exterior and hard-wearing paint applications. Lead was used to prolong shelf life of paint and to increase its flexibility and durability to wear and weather. Acute exposure to lead by

inhalation or ingestion may cause headaches, fatigue, nausea, abdominal cramps and joint pain. Chronic exposures can cause reduced haemoglobin production and reduced lifespan. It has also been known to impact the body's central and peripheral nervous systems and brain function and has been linked to learning disabilities in children.

Currently in Ontario, there is no regulatory limit that determines what concentration of lead constitutes a "lead containing material". On October 21, 2010, Health Canada, under the *Hazardous Products Act*, stated that the lead content in surface-coating materials, furniture, toys and other articles for children, should not exceed 90 mg/kg (0.009%, 90 ppm). However, this is intended for the importation or sale of products within Canada. Therefore, this is not to be misconstrued as a limit established to define a lead-containing material or a limit with respect to lead on construction projects.

The Environmental Abatement Council of Canada (EACC) has also developed the "*Lead Guideline for Construction, Renovation, Maintenance or Repair*" dated October 2014, which discusses the classification, handling, disturbance and removal of lead-containing materials. For the purpose of this guideline, paints or surface coatings containing less than or equal to 0.1% lead by weight (1000 mg/kg or 1000 ppm) are considered low-level lead paints or surface coatings. If these materials (and their respective surfaces) are disturbed in a non-aggressive manner and performed using adequate dust control procedures, then worker protection from the inhalation of lead is not required.

Furthermore, paints or surface coatings containing greater than 0.1% lead by weight are considered lead-containing paints or surface coatings. If these materials (and their respective surfaces) are disturbed, appropriate lead abatement procedures must always be followed.

Exposure to lead-containing materials is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act. Care must be taken to prevent lead-containing particles from becoming airborne during the disturbance of lead-containing surfaces (i.e., during renovation or demolition projects). All lead abatement work must follow procedures outlined in the Guideline Lead on Construction Projects, issued in September 2004 (amended in April 2011) by the Occupational Health and Safety branch of the Ministry of Labour (Type 1-3). Similarly, the lead abatement work procedures outlined in the EACC Lead Guideline for Construction, Renovation, Maintenance or Repair (October 2014) may also be implemented (Class 1-3).

Lead is known to have been used in solder on copper plumbing fixtures, in lead conduit pipes, in lead-calcium battery plates, ammunition, and in nuclear and X-ray shielding devices. However, these materials were not sampled during this investigation, but were noted where applicable.

To verify lead content in paints, representative bulk samples of paint and finishes suspected of containing lead were collected. Bulk samples were scraped down to the building base structure, with all possible layer's present, placed in sealed plastic bags and labeled; and then submitted to an independent laboratory for analysis. Samples were treated with a dilute nitric acid sample digestion prior to filtration. Analysis utilized for lead detection in filtered samples was inductively coupled plasma optical emission spectrometry (ICP-OES).

Mercury

Background Information on Mercury

Mercury is known to cause poisoning in humans through the inhalation of vapours, ingestion of contaminated materials or skin absorption through direct contact with the liquid.

Precautions must be taken to prevent mercury vapours from becoming airborne during renovations or demolition of the building. Exposure to airborne mercury is regulated under the Revised O. Reg. 490/09 as amended – Regulation respecting Mercury – made under the Occupational Health and Safety Act; and under O. Reg. 558, which amended O. Reg. 347/90 (General - Waste Management), mercury is classified as a Schedule 2(b) Hazardous Waste Chemical. Its hazardous waste number is U151.

Mercury is found in products such as thermostats, temperature and pressure gauges, fluorescent lamps and batteries. Mercury in products can be released to the environment through breakage, or disposal at the end of a product's useful life. Improper disposal of these mercury products poses a health and environmental risk to everyone. In addition, the disposal of mercury-containing products can create wastes that are often classified as hazardous. Wastes that leach mercury in concentrations exceeding Ontario Regulation 347/90 (General - Waste Management) limits are also considered hazardous.

The mercury in thermostat switch contains approximately 3-4 grams of mercury in a glass ampoule, typically attached to a metal coil. Mercury-containing switches have been used in thermostats for over 40 years.

Mercury is an essential component in fluorescent lamps and HID lamps. The mercury is in a vapour form and in the phosphor coating on the lamp tube. Estimates of the mercury content contained in compact, 4 foot, and 8-foot lamps are 10 mg, 23 mg, and 46 mg respectively.

Most fluorescent lamps qualify as hazardous waste when removed from service and are therefore prohibited from disposal in the solid waste stream. Fluorescent lamps would be classified as 146T on your facility Generator Registration Report under O. Reg. 347/90 - General Waste Management, as amended by O. Reg. 558/00. Under this regulation, if the leachate results exceed 0.1 milligrams of mercury per litre for a given waste, then the facility must treat the waste as hazardous waste. Most fluorescent and HID lamps will exceed the leachate toxicity limit; therefore, these wastes must be registered and treated as hazardous waste or sent for recycling.

Silica

Background Information on Silica

Silica is expected to be present in building materials such as concrete, brick, mortar and ceramic tiles located throughout the structures. Free crystalline silica (α -Quartz) may be a component in ceiling tiles and gypsum board. Silica (including free crystalline silica) may also be a component of concrete and brick surfaces noted in the building.

Exposure to airborne silica is regulated under Ontario Regulation 490/09, *Designated Substances* - made under the Occupational Health and Safety Act.

Polychlorinated Biphenyls (PCBs)

Background Information on 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 started in 1929 and was banned at the beginning of 1979. After 1981, no manufacturers produced fluorescent and HID lamps with PCB-containing ballasts.

PCBs are not a designated substance under the Occupational Health and Safety Act.

PCB Regulations (SOR/2008-273)

The *PCB Regulations* (the Regulations) 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

Background Information on ODSs

Within Ontario, the general use of 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) ceased in Canada in 1993 as a result of their ozone-depleting characteristics. Importation of CFCs into Canada ceased in 1997 and total ban was placed on their use since 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 growth inside buildings is due to excess moisture caused by leakages, condensation or capillary movement of water into the building. Toxic moulds such as *Stachybotrys chartarum* and some species of *Aspergillus* spp. are greenish-black, wet and slimy moulds that grow on soaking wet cellulose-based materials. They are often found near water leaks or where drying is very slow and can form after flooding if insufficient cleanup and drying occurred. They will generally not occur if materials are kept dry.

MPL conducted a general visual assessment for any obvious signs of visible mould and/or water damage. Based on our visual observations, the following guidelines were used in providing our recommendations for remedial action where required:

- Institute of Inspection Cleaning and Restoration Certification (IICRC) S520 Standard and Reference for Professional Mould Remediation,
- The Canadian Construction Association (CCA) Mould Guidelines for the Canadian construction industry (CCA document 82-2004)
- Environmental Abatement Council of Canada (EACC) Mould Abatement Guidelines.

Other Designated Substances

Select Designated Substances (acrylonitrile, arsenic, coke oven emissions, ethylene oxide, isocyanates, benzene, or vinyl chloride) are not expected to be present in the building in matrix or sufficient quantities to cause an exceedance of Ministry of Labour exposure guidelines. As such, no sampling was conducted for these materials.

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.

In order to reduce the potential for exposure to workers or occupants, any suspect hazardous building material(s) that are not detailed within this survey due to inaccessibility and/or are discovered during renovation/demolition activities, must be properly assessed and/or tested prior to their disturbance.

APPENDIX C

Laboratory Analytical Reports



EMSL Canada Inc.

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

EMSL Canada Order 672001439
 Customer ID: 55CTCS25B
 Customer PO: 0Z2-021101
 Project ID: Ottawa DSS

Attn: Stefan Holik Phone: (613) 836-2184
 McIntosh Perry Consulting Engineers Ltd Fax:
 115 Walgreen Rd RR 3 Collected: 8/12/2020
 Carp, ON K0A 1L0 Received: 8/25/2020
 Analyzed: 9/01/2020

Proj: University of Ottawa 0Z2-021101 (Powerplant) (Ottawa DSS)

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

Client Sample ID: 1.1 **Lab Sample ID:** 672001439-0001

Sample Description: Powerplant/White ceiling texture - M10, M10, M03

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	White	0.0%	98.0%	2% Chrysotile	

Client Sample ID: 1.2 **Lab Sample ID:** 672001439-0002

Sample Description: Powerplant/White ceiling texture - M10, M10, M03

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Positive Stop (Not Analyzed)

Client Sample ID: 1.3 **Lab Sample ID:** 672001439-0003

Sample Description: Powerplant/White ceiling texture - M10, M10, M03

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Positive Stop (Not Analyzed)

Client Sample ID: 2.1-Vinyl Floor Tile **Lab Sample ID:** 672001439-0004

Sample Description: Powerplant/VFT - beige with grey streaks - M12

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	Beige	0.0%	98.0%	2% Chrysotile	

Client Sample ID: 2.1-Mastic **Lab Sample ID:** 672001439-0004A

Sample Description: Powerplant/VFT - beige with grey streaks - M12

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	Black	0.0%	100.0%	None Detected	

Client Sample ID: 2.2-Vinyl Floor Tile **Lab Sample ID:** 672001439-0005

Sample Description: Powerplant/VFT - beige with grey streaks - M12

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Positive Stop (Not Analyzed)

Client Sample ID: 2.2-Mastic **Lab Sample ID:** 672001439-0005A

Sample Description: Powerplant/VFT - beige with grey streaks - M12

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Insufficient Material



EMSL Canada Inc.

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

EMSL Canada Order 672001439
 Customer ID: 55CTCS25B
 Customer PO: 0Z2-021101
 Project ID: Ottawa DSS

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

Client Sample ID: 2.3-Vinyl Floor Tile **Lab Sample ID:** 672001439-0006

Sample Description: Powerplant/VFT - beige with grey streaks - M12

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Positive Stop (Not Analyzed)

Client Sample ID: 2.3-Mastic **Lab Sample ID:** 672001439-0006A

Sample Description: Powerplant/VFT - beige with grey streaks - M12

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Insufficient Material

Client Sample ID: 3.1-Vinyl Floor Tile **Lab Sample ID:** 672001439-0007

Sample Description: Powerplant/VFT - white and grey mix - M06, M06, M06A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	Gray	0.0%	100.0%		None Detected

Client Sample ID: 3.1-Mastic **Lab Sample ID:** 672001439-0007A

Sample Description: Powerplant/VFT - white and grey mix - M06, M06, M06A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Insufficient Material

Client Sample ID: 3.2-Vinyl Floor Tile **Lab Sample ID:** 672001439-0008

Sample Description: Powerplant/VFT - white and grey mix - M06, M06, M06A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	Gray	0.0%	100.0%		None Detected

Client Sample ID: 3.2-Mastic **Lab Sample ID:** 672001439-0008A

Sample Description: Powerplant/VFT - white and grey mix - M06, M06, M06A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Insufficient Material

Client Sample ID: 3.3 **Lab Sample ID:** 672001439-0009

Sample Description: Powerplant/VFT - white and grey mix - M06, M06, M06A

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	Gray	0.0%	100.0%		None Detected

Client Sample ID: 4.1 **Lab Sample ID:** 672001439-0010

Sample Description: Powerplant/DJC - M13

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	White	0.0%	100.0%		None Detected



EMSL Canada Inc.

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

EMSL Canada Order 672001439
Customer ID: 55CTCS25B
Customer PO: 0Z2-021101
Project ID: Ottawa DSS

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

Client Sample ID: 4.2 **Lab Sample ID:** 672001439-0011
Sample Description: Powerplant/DJC - M13

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 4.3 **Lab Sample ID:** 672001439-0012
Sample Description: Powerplant/DJC - M13

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 4.4 **Lab Sample ID:** 672001439-0013
Sample Description: Powerplant/DJC - M13

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	White	0.0%	100.0%	None Detected	

Client Sample ID: 5.1 **Lab Sample ID:** 672001439-0014
Sample Description: Powerplant/Grout - 003

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020	Gray	0.0%	99.0%	1% Chrysotile	

Client Sample ID: 5.2 **Lab Sample ID:** 672001439-0015
Sample Description: Powerplant/Grout - 003

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Positive Stop (Not Analyzed)

Client Sample ID: 5.3 **Lab Sample ID:** 672001439-0016
Sample Description: Powerplant/Grout - 003

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	9/01/2020					Positive Stop (Not Analyzed)



EMSL Canada Inc.

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

EMSL Canada Order 672001439
Customer ID: 55CTCS25B
Customer PO: 0Z2-021101
Project ID: Ottawa DSS

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

Analyst(s):

Ewa Krupinska PLM (2)
Simon Parent PLM (9)

Reviewed and approved by:

Simon Parent, Laboratory Manager
or Other Approved Signatory

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

Samples analyzed by EMSL Canada Inc. Ottawa, ON

Initial report from: 09/01/202014:35:23



EMSL Canada Inc.

2756 Slough Street, Mississauga, ON L4T 1G3
Phone/Fax: (289) 997-4602 / (289) 997-4607
<http://www.EMSL.com> torontolab@emsl.com

EMSL Canada Or 552010425
CustomerID: 55CTCS25B
CustomerPO: 0Z2-021101
ProjectID: Ottawa DSS

Attn: **Stefan Holik**
McIntosh Perry Consulting Engineers Ltd
115 Walgreen Rd RR 3
Carp, ON K0A 1L0

Phone: (613) 836-2184
Fax:
Received: 8/26/2020 11:11 AM
Collected: 8/25/2020

Project: **University of Ottawa 0Z2-021101 Ottawa DSS - Powerplant**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

<i>Client SampleDescription</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
PB1 552010425-0001	8/25/2020	8/26/2020 Site: Powerplant - White Wall - M13A	0.2479 g	0.0081 % wt	0.16 % wt
PB2 552010425-0002	8/25/2020	8/26/2020 Site: Powerplant - Grey Concrete Floor Pads - 003	0.2464 g	0.0081 % wt	0.096 % wt
PB3 552010425-0003	8/25/2020	8/26/2020 Site: Powerplant - Red Floor - 003	0.2491 g	0.0080 % wt	<0.0080 % wt
PB4 552010425-0004	8/25/2020	8/26/2020 Site: Powerplant - White Column - 003	0.2443 g	0.0082 % wt	0.015 % wt
PB5 552010425-0005	8/25/2020	8/26/2020 Site: Powerplant - Beige Floor - M13B	0.2406 g	0.0083 % wt	0.030 % wt
PB6 552010425-0006	8/25/2020	8/26/2020 Site: Powerplant - Grey Wall - M09	0.2415 g	0.0083 % wt	0.27 % wt

Rowena Fanto, Lead Supervisor
or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.008% wt based on the minimum sample weight per our SOP. "<" (less than) result signifies the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. Definitions of modifications are available upon request. Samples analyzed by EMSL Canada Inc. Mississauga, ON AIHA-LAP, LLC - ELLAP #196142

Initial report from 09/02/2020 09:24:14

APPENDIX D

Site Photographs



Photo 1: View of asbestos-containing textured ceiling observed in Room M03, M10, M11, and M12 of Subject Building.

Samples 1.1-1.3



Photo 2: View of asbestos-containing vinyl floor tiles observed in Room M12 of Subject Building.

Samples 2.1-2.3



Photo 3: View of poor condition white wall paint observed in Room M13.
Sample PB1



Photo 4: View poor condition grey wall paint observed in Room M09.
Sample PB6



Photo 5: View of Radioactive Smoke Detector observed in Room M03 of Subject Building.



Photo 6: View of ODS Air Conditioning Unit observed in Room M13A of Subject Building.



Photo 7: View of Winters' Pressure Gauge observed in Room 008 of Subject Building.

APPENDIX E

Asbestos-Containing Materials Checklists

Zone	Floor/Level	Room	ID	Type of ACM	Description	Asbestos Confirmed/ Suspected	Friable/Non-Friable	Damaged/ Deteriorated	Accessibility	Level of Work Near Material	Approx. Quantity	Unit	Recommended Action	Comments
1.5	Ground	Main Power Plant	003	Sealant	Grout	Confirmed	Friable	Good Condition	Easy	High	Throughout	N/A	Manage in Place	
7	Mezzanine	Office	M03	Ceiling Texture Coat	White	Confirmed	Friable	Good Condition	Easy	Low	150	SF	Manage in Place	
2	Mezzanine	Mechanical Room	M09	Pipe Insulation	Grey	Confirmed	Friable	Good Condition	Difficult	Low	45	LF	Manage in Place	InAIR Ltd. BT19-29035 (Aug. 2019)
2	Mezzanine	Mechanical Room	M09	Pipe Insulation	White	Confirmed	Friable	Good Condition	Difficult	Low	45	LF	Manage in Place	InAIR Ltd. BT19-29035 (Aug. 2019)
7	Mezzanine	Locker Room	M10	Ceiling Texture Coat	White	Confirmed	Friable	Good Condition	Easy	Low	120	SF	Manage in Place	
7	Mezzanine	Men's Washroom	M11	Ceiling Texture Coat	White	Suspected	Friable	Good Condition	Easy	Low	100	SF	Manage in Place	
7	Mezzanine	Kitchen	M12	12" x 12" Vinyl Floor Tile	Beige w/ Grey Streaks	Confirmed	Non-Friable	Good Condition	Easy	High	200	SF	Manage in Place	
7	Mezzanine	Kitchen	M12	Ceiling Texture Coat	White	Confirmed	Friable	Good Condition	Easy	Low	200	SF	Manage in Place	
2	Mezzanine	Workshop	M13A	Refractory Cement	Grey	Confirmed	Friable	Poor Condition	Not Accessible	Low	215	SM	Monitor Condition of Material. Consider Removal or Repair.	InAIR Ltd. BT19-29035 (Aug. 2019)
1.5	All	Main Power Plant		Parging cement	Mechanical fittings	Confirmed	Friable	Good Condition	Difficult	Low	140	EA	Manage in Place	
2	All	Main Power Plant		Parging cement	Mechanical fittings	Confirmed	Friable	Good Condition	Difficult	Low	86	EA	Manage in Place	
3	All	Main Power Plant		Parging cement	Mechanical fittings	Confirmed	Friable	Good Condition	Difficult	Low	30	EA	Manage in Place	
7	All	Main Power Plant		Parging cement	Mechanical fittings	Confirmed	Friable	Good Condition	Difficult	Low	16	EA	Manage in Place	
8	All	Main Power Plant		Parging cement	Mechanical fittings	Confirmed	Friable	Good Condition	Difficult	Low	10	EA	Manage in Place	
9	All	Main Power Plant		Parging cement	Mechanical fittings	Confirmed	Friable	Good Condition	Difficult	Low	30	EA	Manage in Place	

APPENDIX F

Hazardous Containing Materials Checklists

Zone	Floor/Level	Location	ID	Floor Finish	Description	Wall Finish	Wall Paint	Ceiling Finish	DS Type	Component	Colour	Condition	Manufacturer	Quantity #	Unit	Suspected/ Confirmed	Recommended Action	Sample ID (if applicable)	Comments
1	Ground	Mechanical Room	008						Polychlorinated Biphenyls (PCBs)	Transformer		Good Condition	Delta, Sigma	1	C	Suspected	Manage in Place. If affected by renovation/demolition, must be decommissioned by a licenced contractor as disposed of in accordance with O. Reg.		
1	Ground	Mechanical Room	008						Mercury	Pressure Gauge		Good Condition	Winters	5	C	Suspected	Manage in Place. If affected by renovation/demolition, must be removed and disposed of as per EACO Guidelines.		
7	Mezzanine	Office	M03							Radioactive Materials		Good Condition	Smoke Detector	1	C	Suspected	Manage in Place		
7	Mezzanine	Office	M06						Ozone Depleting Substances (ODS)	Air Conditioning Unit		Good Condition		1	C	Suspected	Manage in Place. If affected during renovation, must be removed and stored in a safe, secure location and/or properly disposed of in accordance with R.R.O. 1990, Regulation 347 General Waste		
7	Mezzanine	Office	M06							Radioactive Materials		Good Condition	Smoke Detector	1	C	Suspected	Manage in Place		
7	Mezzanine	Office	M06A							Radioactive Materials		Good Condition	Smoke Detector	1	C	Suspected	Manage in Place		
10	Mezzanine	Mechanical Room	M09						Lead	Wall Paint	Grey	Good Condition		100	SF	Suspected	Manage in Place	PB6	0.27 %wt
10	Mezzanine	Mechanical Room	M09						Lead	Boiler Paint	Orange	Good Condition		100	SF	Confirmed	Manage in Place	141-LP-01	0.27 %wt
10	Mezzanine	Mechanical Room	M09						Mercury	Thermostat		Good Condition	Winters, Ingersoll-Rand, Ashcroft	20	C	Suspected			
7	Mezzanine	Locker Room	M10							Radioactive Materials		Good Condition	Smoke Detector	1	C	Suspected	Manage in Place		
7	Mezzanine	Kitchen	M12							Radioactive Materials		Good Condition	Smoke Detector	2	C	Suspected	Manage in Place		
7	Mezzanine	Kitchen	M12						Ozone Depleting Substances (ODS)	Refrigerator		Good Condition		1	C	Suspected	Manage in Place		

Zone	Floor/Level	Location	ID	Floor Finish	Description	Wall Finish	Wall Paint	Ceiling Finish	DS Type	Component	Colour	Condition	Manufacturer	Quantity #	Unit	Suspected/ Confirmed	Recommended Action	Sample ID (if applicable)	Comments
2, 3, 7	Mezzanine	Corridor	M13						Lead	Wall Paint	White	Poor Condition		75	SF	Suspected	Paint must be removed and/or stabilized following Class 1/2 or Type 1/2 lead Procedures as per MOL and EACO		
2, 3, 7	Mezzanine	Corridor	M13						Mercury	Pressure Gauge		Good Condition	Usg, Elster, Weksler, Norgren	10	C	Suspected	Manage in Place		
2, 3, 7	Mezzanine	Corridor	M13						Polychlorinated Biphenyls (PCBs)	Transformer		Good Condition	Greenline	1	C	Suspected	Manage in Place. If affected by renovation/demolition, must be decommissioned by a licenced contractor as disposed of in accordance with O. Reg		
2	Mezzanine	Workshop	M13A						Lead	Wall Paint	White	Poor Condition		30	SF	Confirmed	Manage in Place	PB1	0.16 %wt
2	Mezzanine	Workshop	M13A						Ozone Depleting Substances (ODS)	Refrigerator		Good Condition		1	C	Suspected	Manage in Place. If affected by renovation/demolition, must be decommissioned by a licenced contractor as disposed of in accordance with O. Reg		
2	Mezzanine	Workshop	M13A						Ozone Depleting Substances (ODS)	Air Conditioning Unit		Good Condition		1	C	Suspected			
2	Mezzanine	Storage	M13B						Polychlorinated Biphenyls (PCBs)	Light Ballast		Good Condition		6	C	Suspected			
3	Mezzanine	Storage	M13C						Mercury	Pressure Gauge		Good Condition	Winters, Weiss	10	C	Suspected	Manage in Place		

APPENDIX G

Site Sampling & Location Plans

LEGEND

- 001 ROOM NUMBER
- ▲ BAS-00A BULK ASBESTOS SAMPLE LOCATION
- LBP-00 LEAD PAINT CHIP SAMPLE LOCATION

Note: Full Sample Identification is as follows:

Abbreviation	Full Sample Identification
BAS	CET-[Floor No.]-AS-[Sample Date]-[Sample No.]
LBP	CET-[Floor No.]-LBP-[Sample Date]-[Sample No.]

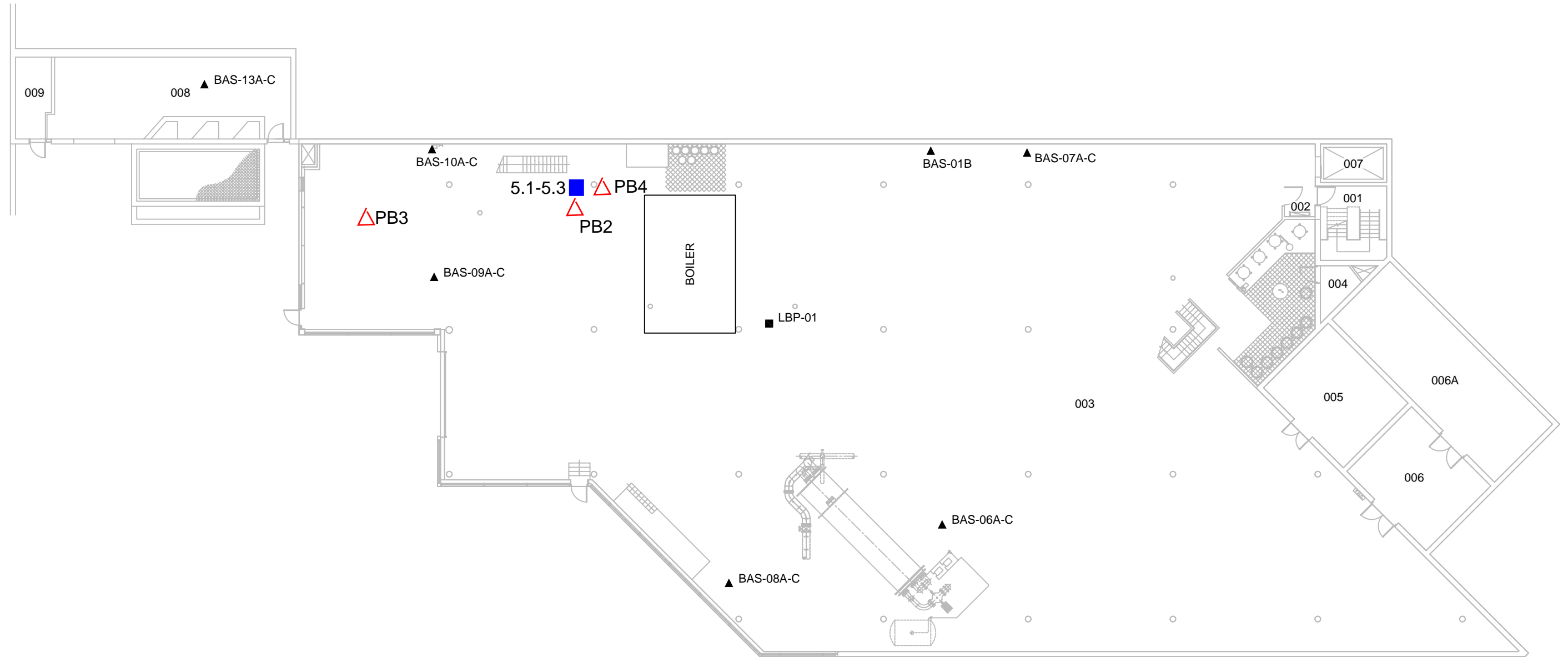
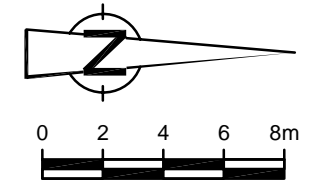


Figure 1
 SAMPLING LOCATIONS
 DESIGNATED SUBSTANCE INVENTORY
 GROUND FLOOR, POWER PLANT
 720 KING EDWARD, OTTAWA, ONTARIO
 University of Ottawa



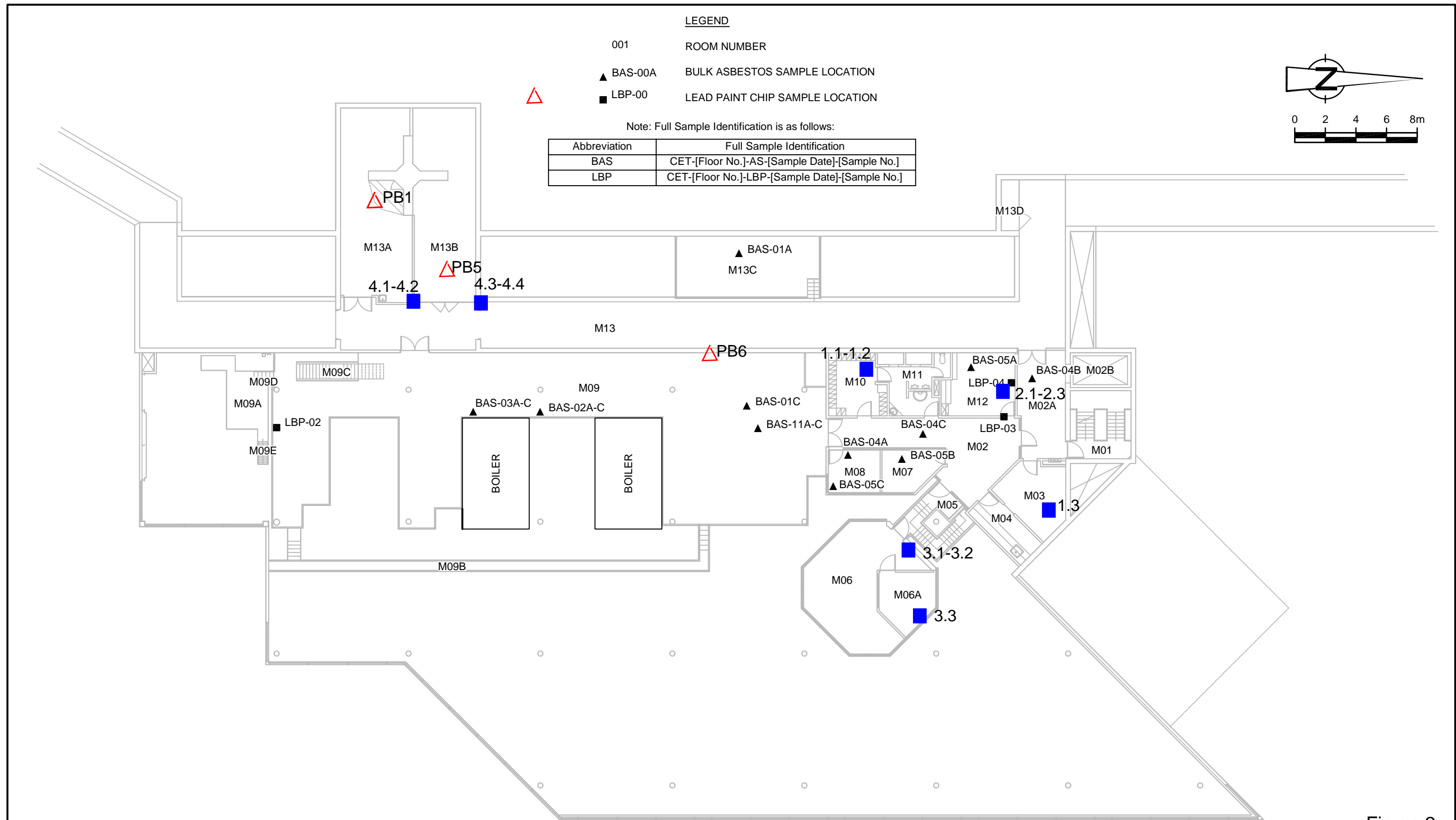


Figure 2
SAMPLING LOCATIONS
DESIGNATED SUBSTANCE INVENTORY
MEZZANINE, POWER PLANT
720 KING EDWARD, OTTAWA, ONTARIO
University of Ottawa

