



**LANARK COUNTY HOUSING CORPORATION
DESIGNATED SUBSTANCE REPORT
ASSESSMENT & SAMPLING
MARCH 2016**

24 BOURKE STREET, SMITH FALLS, ONTARIO



PROJECT NO. 29132

PROJECT NO. 29132

REPORT TO:

**MR. JEFF HALL
MAINTENANCE AND PROPERTY ASSET MANAGER**

ON:

**DESIGNATED SUBSTANCE REPORT
ASSESSMENT & SAMPLING
MARCH 2016**

24 BOURKE STREET, SMITH FALLS, ONTARIO

Greenough Environmental Consulting Inc.

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March 2016

EXECUTIVE SUMMARY

Greenough Environmental Consulting Inc. (GEC) was commissioned by Lanark County Housing Corporation (LCHC), hereinafter referred to as the "Client" to conduct a designated substance survey for the multi-unit apartment complex located at 24 Bourke Street in Smith Falls, Ontario.

The purpose of the investigation was to identify the presence of designated substances within the building.

Based on the visual inspection of accessible areas and laboratory analysis of samples collected, asbestos has been confirmed present within the building. Mercury, Lead and silica are assumed to be present based on historical applications and observations made on-site. Other designated substances may be present in concrete, paints and adhesives but do not represent a significant environmental concern at this time.

A summary of the survey results is presented in Table 1.

TABLE 1 – SUMMARY OF RESULTS AND RECOMMENDATIONS 24 BOURKE STREET, SMITH FALLS, ONTARIO		
Component	Comments	Recommendations
Acrylonitrile	None Identified.	None.
Arsenic	None Identified.	None.
Asbestos	Based on analytical results, the following asbestos-containing materials (ACMs) have been identified according to O. Reg 278/05 (anything found to contain 0.5% asbestos or greater): • Drywall Joint Compound; and • Vinyl Floor Tile. Please note: GEC was given access to five (5) units on the date of the survey, additional ACMs may exist within other units, ceiling/wall cavities, or other inaccessible areas.	○ All ACMs that will be or have the potential of being disturbed, must be removed in accordance with the procedures outlined in Ontario Regulation 278/05 as well as the PWGSC Policy regarding Asbestos Management. ○ Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05. ○ That the roles and responsibility of "the owner" as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training. ○ Ontario Regulation 490/09, as amended to

TABLE 1 – SUMMARY OF RESULTS AND RECOMMENDATIONS
24 BOURKE STREET, SMITH FALLS, ONTARIO

Component	Comments	Recommendations
		O. Reg. 148/12 - Designated Substance - made under the Occupational Health and Safety Act states that airborne levels of asbestos fibres should not exceed 0.1 f/cc.
Benzene	None Identified.	None.
Coke Oven Emission	None Identified.	None.
Ethylene Oxides	None Identified.	None.
Isocyanates	None Identified.	None.
Lead	Based on the laboratory analysis, lead concentrations were observed to be <20µg/g in the painted finishes present within the project areas. Paint surfaces were generally found to be in good condition with minor localized blistering or peeling observed. Based on the age of the building and historical applications, lead is assumed to be present in solder on joints of copper piping, caulking in bell fittings associated with cast iron drainage pipe joints and used on electrical wiring/systems (where observed within the surveyed areas).	In the event that any work is conducted that has the potential to create airborne lead, every employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities as outlined in the Ontario Ministry of Labour Guideline - Lead on Construction Projects dated April 2011. Every employer shall also ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air as per O.Reg 490/09, as amended to 148/12. The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 302/14 – General Waste Management, under the Ontario Environmental Protection Act. Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill without treatment.
Mercury	None identified. May be present in painted finishes.	None
Silica	Silica may be present in drywall, drywall joint compound, plaster, concrete materials and mortars observed within the demolition debris. The potential for the generation of	The following recommendations are made regarding the potential silica-containing materials: ○ Conduct work in accordance with the "Guideline: Silica on Construction Projects" written by the Ministry of Labour. ○ Ensure that all necessary measures and

TABLE 1 – SUMMARY OF RESULTS AND RECOMMENDATIONS 24 BOURKE STREET, SMITH FALLS, ONTARIO		
Component	Comments	Recommendations
	airborne silica dust exists when completing the removal of the building materials (debris).	procedures by means of engineering controls, work practices and hygiene practices and facilities are implemented to ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 milligrams per cubic metre of air by volume for cristobalite and tridymite, and 0.10 milligrams silica per cubic metre of air by volume for quartz and tripoli. ○ Employers have a duty to protect their workers from lead exposure on construction projects. The guideline has been prepared to raise the awareness of employers and workers in the construction industry of the hazards posed by lead in construction and the measures and procedures that should be taken to control those hazards.
Vinyl Chloride	None identified.	None

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Appendix 2 – Lead Analytical Results

1.0 INTRODUCTION

Greenough Environmental Consulting Inc. (GEC) was commissioned by Lanark County Housing Corporation (LCHC), hereinafter referred to as the "Client" to conduct a designated substance survey for the multi-unit apartment complex located at 24 Bourke Street in Smith Falls, Ontario.

The purpose of the investigation was to identify the presence of designated substances within all common areas, as well as 10% of all units within the building.

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

2.0 SCOPE AND METHODOLOGY

The scope of work followed during the assessment was in accordance with the scope of work agreed upon by GEC and LCHC.

All work was completed in accordance with provincial regulations (O. Reg 490/09 and 278/05). The survey included the following designated substances:

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

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

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

Bulk samples of suspected ACMs collected by GEC during the site investigation were analyzed for asbestos content at Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario. The bulk asbestos samples were analyzed using a combination of dispersion staining and Polarised Light Microscopy (PLM). This analytical method complies with the United States Environmental Protection Agency (U.S. EPA) Method 600/R-93/116 dated July, 1993. Paracel is certified under the National Institute of Science and Technology's National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos bulk sample analysis (NVLAP No. 200812-0).

The laboratory utilizes a "positive-stop" analysis methodology and stopped analysis for the particular set of samples once asbestos concentrations at or above 0.5% is detected. Therefore, samples taken in order to satisfy the requirements of O. Reg. 278/05, were not analyzed if the previous sample was identified as asbestos-containing. **Appendix 1** presents asbestos analytical results obtained for the purpose of this survey.

For the purpose of this survey, GEC collected paint chip samples of predominant paint finishes within the specified project areas and submitted the samples to Paracel Laboratories for analysis.

Paracel has received its Certificate of Laboratory Proficiency from the Canadian Association of Environmental Analytical Laboratories (CAEAL) and has achieved accreditation from the Standard Council of Canada.

Analysis of paint chip samples is performed using MOE E3470 (which utilizes EPA Method 6020) which describes the multi-elemental determination of analyses by ICP-OES in environmental samples. The method measures ions produced by a radio-frequency inductively coupled plasma. Analyte species originating in a liquid are nebulized and the resulting aerosol is

transported by argon gas into the plasma torch. The ions produced by high temperatures are entrained in the plasma gas and introduced, by means of an interface, into a mass spectrometer. The ions produced in the plasma are sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier. Interferences must be assessed and valid corrections applied, or the data flagged to indicate problems. Interference correction must include compensation for background ions contributed by the plasma gas, reagents, and constituents of the sample matrix. Prior to analysis, samples which require total values must be acid digested using appropriate sample preparation methods.

Inductively coupled plasma-optical emission spectrometry (ICP/OES) is applicable to the determination of sub-ug/L concentrations of a large number of elements in water samples and in waste extracts or digests. When dissolved constituents are required, samples must be filtered and acid-preserved prior to analysis. No digestion is required prior to analysis for dissolved elements in water samples. Acid digestion prior to filtration and analysis is required for groundwater, aqueous samples, industrial wastes, soils, sludges, sediments, and other solid wastes for which total (acid-leachable) elements are required. **Appendix 2** presents the lead analytical results obtained for the purpose of this survey.

3.0 SURVEY LIMITATIONS

This report reflects the observations of the accessed common areas as well as five (5) units as directed by LCHC. The list of accessed units is as follows:

- Unit 504
- Unit 405
- Unit 309
- Unit 210
- Unit 105

GEC cannot warrant against the discovery of additional ACMs or presence of other designated substances within any other units not accessed on the day of the survey. Furthermore, no access was gained inside wall cavities, closed bulkheads and closed ceilings due to the non-destructive nature of this survey.

The site investigation was completed by Mr. Derek Stashick on March 11th, 2016. Observations expressed in this document apply only to conditions on this date and within the subject areas.

4.0 RESULTS

The results of the survey for designated substances and hazardous materials are discussed below.

4.1 Acrylonitrile

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

4.2 Arsenic

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

4.3 Asbestos

Asbestos has been widely used in buildings, both in friable applications (materials which can be crumbled, pulverized or powdered by hand pressure, when dry) and in non-friable manufactured products. The use of asbestos in friable applications was curtailed around the mid-1970s and, as such, most buildings constructed prior to about 1975 contain some form of friable construction material with an asbestos content. The use of asbestos in certain non-friable materials continued beyond the mid-1970s. Additionally, buildings constructed in the late 1980's and early 1990's could have asbestos present in select building materials.

Table 2 provides a summary of all asbestos analytical results as they relate to the site.

TABLE 2 – RESULTS OF ASBESTOS ANALYSIS			
24 BOURKE STREET, SMITH FALLS, ONTARIO			
SAMPLING COMPLETED IN MARCH 2016			
Sample	Material/Description	Sample Location	Results
SA-01(A-E)	Stipple Ceiling Finish	Throughout	ND
SA-02(A-G)	Drywall Joint Compound	Throughout	1% CH
SA-03(A-C)	Vinyl Baseboard Adhesive	Stairwells	ND
SA-04(A-C)	Yellow Adhesive	On Styrofoam Above Ceiling Grid	ND
SA-05(A-C)	Grey Exterior Caulking	Balcony Ceiling	ND

SA-06(A-C)	Grey Cementous Firestop	Mechanical Room	ND
SA-07(A-C)	Vinyl Floor Tile 1 – 30 cm x 30 cm – Off White with Black Dotted Streaks	Unit 504	4.02% CH
SA-08(A-C)	Vinyl Floor Tile 2 – Brown under Sheet Vinyl Flooring	Ground Floor Locked Washroom	3.93% CH
SA-09(A-C)	Vinyl Floor Tile 3 – 30 cm x 30 cm – Beige with Brown Streaks	Storage Room Adjacent to Lounge	5.42% CH
SA-10(A-C)	Vinyl Floor Tile 4 – 30cm x 30 cm – Off White with Brown and Grey Smears	Unit 210	ND

ND = No asbestos detected in sample submitted

CH = Chrysotile asbestos

4.3.1 Mechanical Systems

Pipe Fittings

Based on the on-site observations, no asbestos-containing mechanical pipe fittings were identified within the surveyed areas. Based on the reported age of the site, the potential exists for asbestos-containing pipe fittings to be present within concealed locations.

Pipe Straights

Based on the on-site observations, no asbestos-containing mechanical pipe straights were identified within the surveyed areas. Based on the reported age of the site, the potential exists for asbestos-containing pipe straights to be present within concealed locations.

4.3.2 Interior Finishes

Wall Systems

Based on the on-site observations made during the investigation, the interior finishes within the building were observed to be comprised of gypsum board (drywall) with drywall joint compound. Sampling of the suspected ACMs is as follows:

- Seven (7) samples (SA-02A/B/C/D/E/F/G) of drywall joint compound were collected from select locations within the building and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, it was found to contain **1% of Chrysotile asbestos**.

Ceiling Systems

Based on the on-site observations made during the investigation, the interior finishes within the building were observed to be comprised of gypsum board (drywall) with drywall joint compound, textured ceiling finish, and acoustic ceiling tiles. Sampling of the suspected ACMs is as follows:

- Seven (7) samples (SA-02A/B/C/D/E/F/G) of drywall joint compound were collected from select locations within the building and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, it was found to contain **1% of Chrysotile asbestos**.
- Five (5) samples (SA-01A/B/C/D/E) of a textured ceiling finish were collected from select locations within the building and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, no asbestos was detected within any of the samples submitted.
- Observations of “date stamps” on acoustic ceiling tiles indicated that all acoustic ceiling tiles are of a newer construction and that sampling was not required.

Based on the laboratory data as well as on-site observations, asbestos-containing drywall joint compound has been identified within the wall and ceiling systems of the building.

4.3.3 Vinyl Flooring

Based on the on-site observations made during the investigation, vinyl flooring finishes within the building were observed to be comprised of vinyl floor tile, or newer construction sheet vinyl flooring (not sampled). Sampling of the suspected ACMs is as follows:

- Three (3) samples (SA-07A/B/C) of an off-white 30cm x 30cm vinyl floor tile with black dotted streaks were collected from unit 504 and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, the floor tile has been confirmed to contain **4.02% Chrysotile asbestos**.
 - These tiles were also identified within units 405, 309 and 105.
 - A total of approximately 150 m² of this floor tile was observed in these accessible areas. But it may be present within other units within the building.

- Three (3) samples (SA-08A/B/C) of a brown vinyl floor tile, found under vinyl sheet flooring, were collected from the ground floor locked washroom and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, the floor tile has been confirmed to contain **3.93% Chrysotile** asbestos.
 - This particular style of vinyl floor tile was only observed within the ground floor locked washroom. However, due to the fact it was observed underneath existing flooring in this location, it stands to reason that it may be present in concealed locations throughout the building..
- Three (3) samples (SA-09A/B/C) of a beige 30cm x 30cm vinyl floor tile with brown streaks were collected from the storage room adjacent to the lounge and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, the floor tile has been confirmed to contain **5.42% Chrysotile** asbestos.
 - Approximately 15 m² of this particular style of floor tile was observed within this area.
- Three (3) samples (SA-10A/B/C) of an off-white 30cm x 30cm vinyl floor tile with brown and grey smears were collected from unit 210 and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, no asbestos was detected within any of the samples submitted.

Based on the laboratory data as well as on-site observations, asbestos-containing vinyl floor tile has been identified within the surveyed areas. Based on the age of the building, the potential exists for additional asbestos-containing vinyl flooring finishes to be present.

4.3.4 Miscellaneous

- Three (3) samples (SA-03A/B/C) of a yellow baseboard adhesive were collected from throughout the building and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, no asbestos was detected within any of the samples submitted.
- Three (3) samples (SA-04A/B/C) of a yellow adhesive on Styrofoam were collected from above the ceiling grid within the 5th floor corridor and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, no asbestos was detected within any of the samples submitted.

- Three (3) samples (SA-05A/B/C) of a grey exterior caulking were collected from the unit 210 balcony ceiling and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, no asbestos was detected within any of the samples submitted.
- Three (3) samples (SA-06A/B/C) of a grey cementitious firestop were collected from the main mechanical room and submitted for laboratory analysis. Based on the laboratory analysis completed in accordance with O.Reg 278/05, no asbestos was detected within any of the samples submitted.

Based on the on-site observations, no asbestos-containing miscellaneous materials were identified within the surveyed areas. Based on the age of the building, the potential exists for asbestos-containing miscellaneous materials to be present within concealed locations.

4.4 Benzene

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

4.5 Coke Oven Emissions

Coke oven emissions are the exhaust released during the burning process of coke (pure carbon). This process was not observed and is not expected to take place within this building; therefore, it is unlikely that coke oven emission concentrations will exceed the maximum allowable TWA_{EV} of 0.15 mg/m³.

4.6 Ethylene Oxides

Ethylene oxides are used in production of many foams, adhesives and paints. Over time, ethylene oxide will volatilize out of these materials and may be present in trace amounts in the ambient air in the area.

4.7 Isocyanates

Isocyanates are raw materials from which all polyurethane products are made. Over time, isocyanates may volatilize out of these materials but will only be present in trace amounts and

are not expected to exceed the maximum allowable TWAEV of 0.005ppm (parts per million).

4.8 Lead

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

Based on site observations and current laboratory analysis, lead concentrations in painted finishes identified within the project areas were measured at <20µg/g.

Current analytical results for the lead sampling conducted are summarized in Table 3.

TABLE 3 – RESULTS OF LEAD ANALYSIS			
24 BOURKE STREET, SMITH FALLS, ONTARIO			
SAMPLING COMPLETED FEBRUARY 2015			
Sample	Item/Location	Surface Colour	Results (ug/g Lead)
LS-01	Stairwell Wall	White	<20
LS-02	Stairwell Floor	Grey	<20
LS-03	Janitor's Room Wall	Green	<20

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

Based on the age of the building and historical applications, lead is assumed to be present in solder on joints of copper piping, caulking in bell fittings associated with cast iron drainage pipe joints and used on electrical wiring/systems (where observed within the renovation areas).

Additionally, lead is presumed to be present in solder on joints of copper piping, caulking in cast iron drainage pipe joints, electrical wiring/systems observed within the building.

4.9 Mercury

Mercury and mercury vapour may be present in fluorescent light tubes. Fluorescent lighting was observed in the survey area. Mercury may also be present in thermometers, switches and thermostats within the building and within painted finishes.

4.10 Silica

During the survey, GEC identified various building materials that if disturbed during removal, have the potential to release silica fibres, a material classified as a designated substance in the Occupational Health and Safety Act.

Based on historical applications, silica is presumed present in drywall, drywall joint compound, plaster, concrete materials and mortars observed within the structure.

4.11 Vinyl Chloride

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

5.0 CONCLUSIONS / RECOMMENDATIONS

5.1 Asbestos

The following recommendations are made respecting O.Reg 278/05:

- Prior to the planned renovations, all ACMs (drywall joint compound and vinyl floor tile) that will be or has the potential of being disturbed, must be removed in accordance with the procedures outlined in Ontario Regulation 278/05 as well as the PWGSC Policy regarding Asbestos Management.
- Suspect materials identified during renovation and/or demolition activities not discussed in this report herein should be treated as ACMs unless proven otherwise through material specific sampling and analysis in accordance with the requirements of Ontario Regulation 278/05.
- That the roles and responsibility of "the owner" as stipulated in Section 8 of Ontario Regulation 278/05 be recognized and adhered to including, but not limited to, notification to occupiers and workers as well as training.

- Ontario Regulation 490/09, as amended to O. Reg. 148/12 - Designated Substance - made under the Occupational Health and Safety Act states that airborne levels of asbestos fibres should not exceed 0.1 f/cc.

5.2 Lead

In the event that any work is conducted that has the potential to create airborne lead, every employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene practices and facilities as outlined in the Ontario Ministry of Labour Guideline - Lead on Construction Projects dated April 2011.

Every employer shall also ensure that the time-weighted average exposure of a worker to airborne lead, except tetraethyl lead, shall not exceed 0.05 milligrams lead per cubic metre of air, and in the case of exposure to tetraethyl lead 0.10 milligrams lead per cubic metre of air as per O.Reg 490/09, as amended to 148/12.

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

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

- Painted surfaces (confirmed);
- Caulking in cast iron drainage pipe joints (assumed);
- Solder on the joints of copper pipes (assumed); and
- Solder on electrical wiring / equipment etc. (assumed).

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

The disposal of construction waste containing lead is controlled by Ontario Regulation 347/90 as amended to O. Reg. 302/14 – General Waste Management, under the Ontario Environmental Protection Act. Leachate tests for lead in construction waste must not exceed 5 mg/L in order to be disposed of at a local landfill without treatment.

5.3 Mercury

It is unlikely that the presence of mercury in equipment will lead to unintended ingestion, inhalation or absorption of mercury, if equipment remains in good working condition.

All work must be conducted on mercury-containing equipment so that mercury does not exceed the maximum allowable TWAEV of 0.01 mg/m^3 of air as outlined in O. Reg. 490/09.

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

5.4 Silica

Silica dust can be generated by drilling, coring, blasting, grinding, crushing and sandblasting silica-containing materials.

Work on silica-containing materials can be performed by any construction personnel. GEC recommends that all personnel involved with, or working in the area of, destructive activities on block, concrete, and other silica-containing building materials take the following precautions:

- Segregate the work area from the rest of the building to reduce the risk of exposing building occupants to silica dust. Workers leaving the work area should pass through a designated clean room where excess dust can be brushed off clothes and facilities are available to wash dust off skin.
- The work surface should be wetted regularly to limit dust released during striking and abrasion.
- Everyone in the work area should be provided with a half-face respirator equipped with HEPA filters.
- Ensure that all necessary measures and procedures by means of engineering control, work and hygiene practices are implemented to ensure that the TWAEV of a worker to silica is reduced to the lowest practical level and in any event shall not exceed 0.05 mg/m^3 of air for cristobalite and tridymite, and 0.10 mg/m^3 of air for quartz and tripoli.

6.0 CLOSURE

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

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

This report was not intended to provide direction or procedures for the handling of designated substances and hazardous materials. Only persons with documented, current training in the safe handling of the designated substances and hazardous materials should handle them.

Persons handling any of the designated substances and/or hazardous materials identified in this survey, or conducting work in the vicinity of these materials are advised to consult this survey and individuals with appropriate experience and training, prior to doing so.

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

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

Yours Truly,

GREENOUGH ENVIRONMENTAL CONSULTING INC.



Derek R. Stashick, B.Ed, WRT, CMI
Environmental Consultant



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

APPENDIX 1

ANALYTICAL RESULTS – ASBESTOS SAMPLE ANALYSIS



Certificate of Analysis

Greenough Environmental Consulting Inc.

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

Client PO:
Project: 29132
Custody:

Report Date: 7-Apr-2016
Order Date: 4-Apr-2016

Order #: 1615095

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

Paracel ID	Client ID		
1615095-01	SA-01A	1615095-27	SA-07C
1615095-02	SA-01B	1615095-28	SA-08A
1615095-03	SA-01C	1615095-29	SA-08B
1615095-04	SA-01D	1615095-30	SA-08C
1615095-05	SA-01E	1615095-31	SA-09A
1615095-06	SA-02A	1615095-32	SA-09B
1615095-07	SA-02B	1615095-33	SA-09C
1615095-08	SA-02C	1615095-34	SA-10A
1615095-09	SA-02D	1615095-35	SA-10B
1615095-10	SA-02E	1615095-36	SA-10C
1615095-11	SA-02F		
1615095-12	SA-02G		
1615095-13	SA-03A		
1615095-14	SA-03B		
1615095-15	SA-03C		
1615095-16	SA-04A		
1615095-17	SA-04B		
1615095-18	SA-04C		
1615095-19	SA-05A		
1615095-20	SA-05B		
1615095-21	SA-05C		
1615095-22	SA-06A		
1615095-23	SA-06B		
1615095-24	SA-06C		
1615095-25	SA-07A		
1615095-26	SA-07B		

Emma Diaz
Senior Analyst

Approved By:

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

Certificate of Analysis
Client: Greenough Environmental Consulting Inc.

Report Date: 07-Apr-2016

Order Date: 4-Apr-2016

Client PO:
Project Description: 29132

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

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1615095-01	11-Mar-16	sample homogenized	White	Stipple	No	Client ID: SA-01A Non-Fibers	100
1615095-02	11-Mar-16	sample homogenized	White	Stipple	No	Client ID: SA-01B Non-Fibers	100
1615095-03	11-Mar-16	sample homogenized	White	Stipple	No	Client ID: SA-01C Non-Fibers	100
1615095-04	11-Mar-16	sample homogenized	White	Stipple	No	Client ID: SA-01D Non-Fibers	100
1615095-05	11-Mar-16	sample homogenized	White	Stipple	No	Client ID: SA-01E Non-Fibers	100
1615095-06	11-Mar-16	sample homogenized	White	Drywall Joint Compound	Yes	Client ID: SA-02A Chrysotile Non-Fibers	1 99
1615095-07	11-Mar-16					Client ID: SA-02B not analyzed	
1615095-08	11-Mar-16					Client ID: SA-02C not analyzed	
1615095-09	11-Mar-16					Client ID: SA-02D not analyzed	
1615095-10	11-Mar-16					Client ID: SA-02E not analyzed	
1615095-11	11-Mar-16					Client ID: SA-02F not analyzed	
1615095-12	11-Mar-16					Client ID: SA-02G not analyzed	
1615095-13	11-Mar-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-03A Non-Fibers	(AS-PRE) 100
1615095-14	11-Mar-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-03B Non-Fibers	(AS-PRE) 100
1615095-15	11-Mar-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-03C Non-Fibers	(AS-PRE) 100
1615095-16	11-Mar-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-04A Non-Fibers	(AS-PRE) 100
1615095-17	11-Mar-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-04B Non-Fibers	(AS-PRE) 100

Certificate of Analysis

Report Date: 07-Apr-2016

Client: Greenough Environmental Consulting Inc.

Order Date: 4-Apr-2016

Client PO:

Project Description: 29132

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

Parcel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1615095-18	11-Mar-16	sample homogenized	Brown	Adhesive	No	Client ID: SA-04C [AS-PRE] Non-Fibers	100
1615095-19	11-Mar-16	sample homogenized	Grey	Caulk	No	Client ID: SA-05A [AS-PRE] MMVF Non-Fibers	1 99
1615095-20	11-Mar-16	sample homogenized	Grey	Caulk	No	Client ID: SA-05B [AS-PRE] MMVF Non-Fibers	1 99
1615095-21	11-Mar-16	sample homogenized	Grey	Caulk	No	Client ID: SA-05C [AS-PRE] MMVF Non-Fibers	1 99
1615095-22	11-Mar-16	sample homogenized	Grey	Firestop	No	Client ID: SA-06A Non-Fibers	100
1615095-23	11-Mar-16	sample homogenized	Grey	Firestop	No	Client ID: SA-06B Non-Fibers	100
1615095-24	11-Mar-16	sample homogenized	Grey	Firestop	No	Client ID: SA-06C MMVF Non-Fibers	1 99
1615095-25	11-Mar-16	sample homogenized	Grey/Black	Floor Tile/Mastic	Yes	Client ID: SA-07A [ASLYR, AS-PRE] Chrysotile Non-Fibers	4.02 95.98
1615095-26	11-Mar-16					Client ID: SA-07B not analyzed	
1615095-27	11-Mar-16					Client ID: SA-07C not analyzed	
1615095-28	11-Mar-16	sample homogenized	Beige/Black	Floor Tile/Mastic	Yes	Client ID: SA-08A [ASLYR, AS-PRE] Chrysotile Non-Fibers	3.93 96.07
1615095-29	11-Mar-16					Client ID: SA-08B not analyzed	
1615095-30	11-Mar-16					Client ID: SA-08C not analyzed	
1615095-31	11-Mar-16	sample homogenized	Grey	Floor Tile	Yes	Client ID: SA-09A [AS-PRE] Chrysotile Non-Fibers	5.42 94.58

Certificate of Analysis

Client: Greenough Environmental Consulting Inc.

Report Date: 07-Apr-2016

Order Date: 4-Apr-2016

Client PO:

Project Description: 29132

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

Paracel I.D.	Sample Date	Layers Analyzed	Colour	Description	Asbestos Detected:	Material Identification	% Content
1615095-32	11-Mar-16					Client ID: SA-09B not analyzed	
1615095-33	11-Mar-16					Client ID: SA-09C not analyzed	
1615095-34	11-Mar-16	sample homogenized	Beige/Brown	Floor Tile/Mastic	No	Client ID: SA-10A Non-Fibers	(ASLYR, AS-PRE) 100
1615095-35	11-Mar-16	sample homogenized	Beige/Brown	Floor Tile/Mastic	No	Client ID: SA-10B Non-Fibers	(ASLYR, AS-PRE) 100
1615095-36	11-Mar-16	sample homogenized	Beige/Brown	Floor Tile/Mastic	No	Client ID: SA-10C Non-Fibers	(ASLYR, AS-PRE) 100

* MMVF: Man Made Vitreous Fibers: Fiberglass, Mineral Wool, Rockwool, Glasswool

** Analytes in bold indicate asbestos mineral content.

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	NVLAP Lab Code *	Analysis Date
Asbestos, PLM Visual Estimation	by EPA 600/R-93/116	Ottawa West Lab	200812-0	7-Apr-16

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

Qualifier Notes

Sample Qualifiers :

ASLYR: Layers were noted for this sample, however, the entire sample was homogenized per client request.

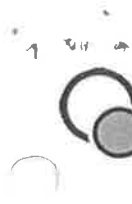
AS-PRE: Due to the difficult nature of the bulk sample (interfering fibers/binders), additional NOB preparation was required prior to analysis

Work Order Revisions / Comments

None

APPENDIX 2

ANALYTICAL RESULTS – LEAD SAMPLE ANALYSIS



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Certificate of Analysis

Greenough Environmental Consulting Inc.

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

Client PO:
Project: 29132
Custody:

Report Date: 7-Apr-2016
Order Date: 4-Apr-2016

Order #: 1615106

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

Paracel ID	Client ID
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1615106-01	LS-01
1615106-02	LS-02
1615106-03	LS-03

Approved By: _____

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

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

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Metals, ICP-OES	based on MOE E3470, ICP-OES	6-Apr-16	6-Apr-16

Sample Data Revisions

None

Work Order Revisions/Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

Sample Results

Lead				Matrix: Paint
				Sample Date: 11-Mar-16
Paracel ID	Client ID	Units	MDL	Result
1615106-01	LS-01	ug/g	20	<20
1615106-02	LS-02	ug/g	20	<20
1615106-03	LS-03	ug/g	20	<20

Laboratory Internal QA/QC

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Matrix Blank									
Lead	ND	20	ug/g						
Matrix Duplicate									
Lead	ND	20	ug/g	ND			0.0	30	
Matrix Spike									
Lead	227		ug/L	ND	92.7	70-130			