ECOH
Environmental Consulting
Occupational Health

Designated Substances Assessment
Scope of Work and Methodology Report

Prepared for:

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1.0 INTRODUCTION

ECOH Management Inc. (ECOH) was retained by the Windsor Essex Community Housing Corporation (the "Client") to conduct designated substances assessments of multiple buildings within the Windsor Essex Community Housing Corporation (WECHC) building portfolio. This project corresponds to the WECHC Request for Proposal No. RFP 15-09. The purpose of this project is to ensure that each building has a current designated substances assessment to ensure conformance with the Occupational Health & safety Act, including Ontario Regulation 278/05 "*Designated Substance – Asbestos on Construction Projects and in Building and Repair Operations*".

This report provides details related to the project scope of work, assessment methodology, general recommendations and limitations. Specific findings of each assessment are summarized in individual reports for each facility. The site-specific reports prepared for each facility may be obtained through the WECHC.

This designated substance assessment was performed for the purposes of long-term management of designated substances contained within building materials, and not necessarily for construction or renovation purposes. An additional pre-renovation/pre-demolition assessment for designated substances and hazardous materials should be considered prior to any future demolition, renovation or maintenance activities that may disturb building materials that potentially contain designated substances or hazardous materials.

1.1 Scope of Assessment

The "assessment area" consists of all accessible areas of the building. The assessment was performed to establish the location and type of designated substances incorporated in the building structure, systems and finishes. For the purpose of this assessment and reporting, designated substances shall include the following;

- Acrylonitrile
- Arsenic
- Asbestos
- Benzene
- Coke oven emissions
- Ethylene oxide
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl chloride

Assessment of building site conditions related to processes, articles within the building(s) (such as stored items, furniture, etc.), subsurface materials or equipment (such as vessels, drums, pipes, etc.), possible contaminants in the soil and groundwater on the site, and sampling of materials that could result in a hazard to the surveyor and/or damage to the building systems or finishes, were not included in this assessment.

1.2 Regulatory Requirements

Regulatory requirements and guidelines applicable to the designated substances noted above include, but are not limited, to the following:

- Ontario Occupational Health and Safety Act and applicable Regulations including;
  - Control of Exposure to Biological or Chemical Agents – Ontario Regulation 833, as amended
  - Designated Substances – Ontario Regulation 490/09, as amended,
  - Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations – Ontario Regulation 278/05, as amended,
- Ontario Environmental Protection Act and Regulations, including;
  - General – Waste Management – Ontario Regulation 347, as amended,
- Canadian Environmental Protection Act and applicable Regulations,
- Ministry of Labour "*Guideline – Silica on Construction Projects*", dated April 2011,
- Ministry of Labour "*Guideline – Lead on Construction Projects*", dated April 2011,
- Environmental Abatement Council of Ontario (EACO) 2014 document, "*Lead Guideline For Construction, Renovation, Maintenance or Repair*",

2.0 ASSESSMENT METHODOLOGY

2.1 General Methodology

Prior to going on-site, the surveyor reviewed any historical documentation and floor plan drawings available for the building(s). The surveyor entered common areas including; corridors, service areas/mechanical rooms, offices, storage areas etc., as well as a representative number of tenant units (i.e. 10% Units in High-Rise, Low-Rise and Mid-Rise apartment buildings and 20% of each unit type variation group for Townhomes, Semi-Detached and Single Family Homes) where access was possible within the extent of the assessed area, and completed a visual inspection for the presence of designated substances. Relevant information was recorded where designated substances were observed, including approximate quantities, locations, condition, sample information and sample locations. Quantities reported are an approximate visual estimate.

The investigation was limited to non-intrusive visual inspections and testing. Concealed locations such as spaces above solid ceilings, and within shafts and pipe chases, were accessed via existing access panels where available. This investigation does not include the removal or demolition of walls, solid ceilings, flooring, structural items, building finishes or building systems to inspect for conceal materials.

2.2 Asbestos

The surveyor completed a visual inspection, based upon historical information related to the use of asbestos in building materials, to identify materials that may potentially contain asbestos. For each potential asbestos-containing material (ACM) identified, notes were made regarding the location, accessibility, condition, and approximate quantities of materials.

Sample locations were recorded on floor plan drawings. The number of samples collected from each potentially ACM (that is considered a homogenous material) was in compliance with the requirements of Ontario Regulation 278/05, which provides a minimum number of samples (3, 5, or 7 depending on quantity and type of material) for a material to be considered non-asbestos as depicted in the following table (Ontario Regulation 278/03, Table 1, Bulk Material Samples).

Type of Material	Size of Homogeneous Material	Minimum Number of Bulk Samples
Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise, such as acoustical plaster on ceilings and fireproofing materials on structural members	Less than 90 square metres	3
	90 or more square metres, but less than 450 square metres	5
	450 or more square metres	7
Thermal insulation, except as described below	Any size	3
Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
Other material	Any size	3

The surveyor inspected for the presence of friable asbestos materials (e.g. sprayed insulation, acoustic/texture plaster, mechanical insulation, etc.) and non-friable asbestos materials (e.g. asbestos cement (transite) ceiling tiles or piping, acoustic ceiling tiles, vinyl floor tiles, vinyl sheet flooring, asbestos textiles (curtains, vibration dampers), plaster, drywall joint compound, etc.). Representative bulk samples of these friable and non-friable materials were collected to confirm asbestos content.

The collected bulk samples were placed in plastic bags, sealed, and shipped to an independent laboratory. A formal chain of custody procedure is maintained between ECOH and the sub-contracted laboratory during sample transport. Samples were then analysed following the analytical procedure prescribed by Ontario Regulation 278/05, which is, U.S. Environmental Protection Agency Test Method EPA/600/R-93/116: "*Method for the Determination of Asbestos in Bulk Building Materials*". June 1993.

Although not required by provincial regulation, all laboratories used by ECOH are accredited under the U.S. National Voluntary Laboratory Accreditation Program (NVLAP) to ensure consistent, accurate and defensible results. The Chain of Custody and the Certificate of Analysis for all bulk sampling are included in site-specific reports.

The collection of samples was performed with sufficient frequency to obtain a general pattern of asbestos use within the building. Due to building renovations or modifications that may have occurred in the past, the consistency of the application of asbestos materials may not be uniform throughout the entire facility. It is important to note that without sampling every wall, pipe section, ceiling tile, etc., it is not possible to identify the asbestos content in every section of material (that is considered a homogenous material) present in the building. For this reason, similar materials to those already sampled elsewhere in the building were visually identified as being the same (i.e. a homogenous material) as those samples without additional analysis.

There are a number of non-friable materials, which may contain asbestos, that were not included in this assessment. It is more ideal to determine the presence of asbestos in these materials immediately prior to a demolition, renovation or maintenance project. Examples of these suspect non-friable materials are listed below. Sampling of these materials was not completed because sampling may cause significant damage to the material, building systems or building envelope.

- vermiculite inside concrete block walls, above solid ceilings and in manufactured components,
- elevator and lift brakes,
- components or wiring within motors or lights,
- high voltage wiring,

- mechanical packing, ropes and gaskets,
- fire-doors,
- window caulking,
- demountable fire resistant walls,
- roofing, roofing felt and building paper,
- caulking, mastics, adhesives, and
- refractory materials within incinerators or boilers.

Concealed locations such as spaces above solid ceilings, and within shafts and pipe chases, were accessed via existing access panels where available. This investigation does not include the removal or demolition of walls, solid ceilings, flooring, structural items, building finishes or building systems to inspect for conceal materials.

Sampling was performed in discrete locations with minimal damage to building finishes. Sample locations are repaired to the extent practical and the area is cleaned. Vinyl flooring materials, which cannot be repaired, are sampled at baseboards, door frames, areas of existing damage, etc. Sample locations of mechanical insulations or jacketing, such as pipes, ductwork and equipment, are sealed with tape when necessary.

2.3 Lead

Where sampling for materials suspected of containing lead was practical (i.e. where damaged materials were observed, such as flaking paint), bulk samples were collected for laboratory analysis. The collected bulk samples were placed in plastic bags, sealed, and shipped to an independent laboratory. A formal chain of custody procedure is maintained between ECOH and the sub-contracted laboratory during sample transport. Samples are analysed following approved analytical procedures that correspond to the sample matrix (e.g. paint chip). All laboratories used by ECOH are accredited under the U.S. EPA National Environmental Lead Laboratory Accreditation Program (NLLAP) and/or American Industrial Hygiene Association (AIHA) Environmental Lead Laboratory Accreditation Program (ELLAP) to ensure consistent, accurate and defensible results.

Although no regulations exist in Ontario to defined a lead-based paint, guidelines indicate that paints containing lead at, or above, 5000 parts per million (i.e. 0.5% lead concentration by dry weight) are considered to be a lead-based. The Chain of Custody and the Certificate of Analysis for all bulk sampling are included in site-specific reports.

2.4 Other Designated Substances

Building materials suspected of containing other designated substances (i.e. Acrylonitrile, Arsenic, Benzene, Coke Oven Emissions, Ethylene Oxide, Isocyanates, Mercury, Silica, and Vinyl Chloride (monomer), if present, were identified by appearance, age, and knowledge of historic applications.

2.5 Site-Specific Reporting

Specific findings of each assessment are summarized in individual reports for each facility/facility group. The site-specific reports prepared for each facility may be obtained through the WECHC. Each site-specific report includes the following information:

1. Introduction
2. Scope of Work and Methodology (reference to this report)
3. Findings (summary table)
4. Recommendations
5. Limitations of Assessment
6. Appendices
    I. Survey Drawings
    II. Inventory of Identified Designated Substances (Room-by-Room Data)
    III. Observation Report (Photographs)
    IV. Results of Bulk Sample Analysis

3.0 RECOMMENDATIONS

1. Prior to future construction or renovation projects, additional assessments will be required to confirm the presence of designated substances that have been assumed to be on-site and/or that may be present in concealed areas (such as above solid ceilings, within bulkheads, pipe chases, etc.). The impact to designated substances during future demolition, renovation or maintenance activities should be assessed on a project-by-project basis.
2. Recommendations for remedial action are provided within site-specific reports.
3. Disposal of any designated substances, if required, must be completed in compliance with applicable federal and provincial Acts and Regulations.

3.1 Asbestos

3.1.1 Administrative Recommendations

Where asbestos materials are confirmed to be present in a building, an Asbestos Management Plan is required to comply with Ontario Regulation 278/05: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations. The following are typical components of a comprehensive Asbestos Management Plan.

1. Prepare and keep on the premises a record of all confirmed and assumed asbestos-containing materials (ACM), including details of location, accessibility, friability and condition.
2. Give any other person who is an occupier of the building written notice of any information in the record that relates to the area occupied by the person.
3. Give any employer with whom the owner arranges or contracts for work (directly or indirectly) written notice of the information in the record, if the work,
    a. may involve material mentioned in the record, or
    b. may be carried on in close proximity to such material and may disturb it.
4. Advise the workers employed by the owner who work in the building of the information in the record, if the workers may do work that,
    a. involves material mentioned in the record, or
    b. is to be carried on in close proximity to such material and may disturb it.
5. Establish and maintain, for the training and instruction of every worker employed by the owner who works in the building (and who may do work that may disturb asbestos) a program dealing with,
    a. the hazards of asbestos exposure,
    b. the use, care and disposal of protective equipment and clothing to be used and worn when doing the work,
    c. personal hygiene to be observed when doing the work, and
    d. the measures and procedures prescribed by Regulation 278/05.
6. Inspect the material mentioned in the record at reasonable intervals in order to determine its condition.
7. The record of ACM shall be updated once every 12 month period or whenever information changes.
8. Repair or remove all damaged ACM where it may be disturbed and become airborne (refer to site-specific report recommendations).

9. Annually submit copies of Asbestos Work Reports to the Ministry of Labour for workers performing Type 2 or 3 asbestos operations and upon termination of the worker.
10. In addition to the minimum regulatory requirements above, an Asbestos Management Plan should include other items to ensure good compliance (e.g. allocation of internal responsibilities, written asbestos work practices for specific operations, standard forms, provisions for inspection and air monitoring, etc.).

3.1.2 Recommendations for Corrective Actions

The materials requiring remedial action for regulatory compliance are detailed in the site-specific reports. The following is a prioritized list of typical short term actions. Recommendations for remediation are based on the evaluation criteria and Abatement Priority Matrix Table in Appendix I of this report.

PRIOIRTY 1 **Immediate Abatement Required**

PRIORITY 2 **Abatement/Repair Required Within a Specified Timeframe**

PRIORITY 3 **No Immediate Action Required. Inspect Materials at Regular Intervals.**

3.2 Lead

Cutting, grinding, drilling, removing, stripping or demolition of materials containing or coated with lead should be completed only with proper respiratory protection and other worker safety precautions as outlined in the Ministry of Labour document, *"Guideline – Lead on Construction Projects"*, dated April 2011, or the Environmental Abatement Council of Ontario (EACO) 2014 document, "*Lead Guideline For Construction, Renovation, Maintenance or Repair*".

The Ministry of Labour has not established a lower limit for concentrations of lead in paint (or other materials) below which precautions do not need to be considered. Therefore, the level of lead safety precautions should be assessed on a project-by-project basis.

3.3 Mercury

The presence of mercury as a possible constituent of paints and adhesives and within assembled units (e.g. as a vapour in fluorescent light bulbs and as a liquid in termostats, mechanical switch gears, etc.) should not be considered a hazard provided that the assembled units remain sealed and intact. Avoid direct skin contact with mercury and avoid inhalation of mercury vapour.

3.4 Silica

Any work involving the disturbance of materials that may contain silica (e.g. concrete, bricks, mortar, etc.) should be conducted following recommendations detailed in the Ministry of Labour document "*Guideline – Silica on Construction Projects*", dated April 2011.

3.5 Other Designated Substances

Other designated substances (i.e. Acrylonitrile, Arsenic, Benzene, Coke Oven Emissions, Ethylene Oxides, Isocyanates, and Vinyl Chloride (monomer), if present, would not be expected to be a source of concern during normal day-to-day facility operations. During normal construction, renovation or maintenance activities, these designated substances should be adequately addressed using general health and safety precautions including, in part, the use of dust suppression techniques and appropriate respiratory protection.

4.0 LIMITATIONS OF ASSESSMENT

Due to the nature of building construction and on-going building activities, some limitations exist as to the possible thoroughness of a building survey. The field observations, measurements and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings and conclusions presented in this report. The findings and conclusions drawn by ECOH Management Inc. (ECOH) are limited to the specific scope of work for which ECOH was retained and are based solely on information generated as a result of the specific scope of work authorized by the Windsor Essex Community Housing Corporation (WECHC). The results of the assessment are limited to visual inspection of areas made accessible to ECOH personnel and information obtained from facility personnel, when obtained.

ECOH warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the assessment. However, there is no warranty, expressed or implied, that this assessment has uncovered all environmental concerns on the subject site. In addition, ECOH cannot guarantee the completeness or accuracy of information supplied by a third party.

This report was prepared by ECOH for the WECHC. The material in it reflects ECOH's professional interpretation of information available at the time of report preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. ECOH accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based

on this report. Should additional information become available that suggests other environmental issues of concern beyond that described in this report, ECOH retains the right to review this information and modify conclusions and recommendations presented in this report accordingly.

5.0 CLOSURE

Should there be any questions regarding the contents of this report, please contact the undersigned at 905-795-2800.

ECOH
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APPENDIX I

ASBESTOS ASSESSMENT MATRIX

ASBESTOS EVALUATION CRITERIA AND BASIS OF RECOMMENDATIONS

The detailed asbestos assessment provides information regarding the location, condition and accessibility of asbestos-containing materials (ACM) used in the construction of the building. In order to make recommendations for compliance with current regulations the following ACM evaluation criteria based was implemented.

EVALUATION OF CONDITION

Spray Applied Fireproofing, Insulation and Texture Finishes

To evaluate the condition of asbestos-containing sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes, the following criteria is applied:

Good — Surface of material shows no significant signs of damage, deterioration or delamination. Evaluation of sprayed materials requires the surveyor to be familiar with the typical irregular surface texture as installed. "Good" condition includes unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, or encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor — Surface of material shows signs of significant damage, is delaminating or deteriorating. Significant delamination to surface of ACM spray. Debris from the fireproofing is present or has been reported.

Where damage exists in isolated locations, both "Good" and "Poor" condition may be applicable. The extent or percentage of each condition will be recorded in the Inventory of Identified Designated Substances included in Appendix II of each site-specific report. "Fair" condition is not utilized in the evaluation of asbestos-containing sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes.

The evaluation of asbestos-containing sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes, which are present above ceilings, may be limited by the number of observations made and by building components such as ducts or full height walls that may obstruct observations. Persons entering the ceiling space are advised to be watchful for asbestos-containing debris prior to accessing or working above ceilings in areas of buildings with this type of ACM regardless of the reported condition.

Mechanical Insulation

To evaluate the condition of mechanical insulation, such as on vessels, boilers, breeching, ducts, pipes, fan units, equipment, etc., the following criteria was applied.

Good Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor damage (i.e. scuffs or stains), but the jacketing is not penetrated.

Fair Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that was never jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges from minor to none. Damage can be repaired.

Poor Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

The evaluation of mechanical insulation may be limited by the number of observations made and by building components such as ducts or full height walls that may obstruct observations. It is not possible to observe each foot of mechanical insulation from all angles. Persons working in proximity to asbestos-containing mechanical insulation or entering ceilings with asbestos-containing mechanical insulation are advised to be watchful of asbestos-containing debris regardless of the reported condition.

Non-friable Materials

Non-friable materials include materials such vinyl floor tiles, vinyl sheet flooring, transite, etc. To evaluate the condition of non-friable materials, which have the potential to become friable (e.g. due to unplanned disturbances, long-term friction, exposure to weather, construction activities, etc.), the following criteria was applied.

Good	No significant damage. Material may be cracked or broken but is stable and not likely to become friable upon casual contact. If there is no friable debris present, the condition is rated as "Good"
Poor	Material is severely damaged. Loose debris is present or the material binding element has disintegrated to the point where the material has become friable.

The evaluation of the condition of non-friable materials does not use a "Fair" condition.

Evaluation of Asbestos-Containing Debris

The identification of the exact location or presence of debris on the top of ceiling tiles maybe limited by the number of observations made and by building components such as ducts or full height walls that may obstruct observations. Workers are advised to be watchful for the presence of debris prior to accessing areas, or working in proximity to, any type of ACM regardless of the reported presence or absence of debris.

Debris from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source and is referred to as debris. Debris is noted in "Poor" condition only.

Debris from Non-Friable ACM

The presence of damaged ACM from non-friable material is also noted separately from the non-friable ACM source. Only non-friable ACM that has become friable is reported as debris. Debris is noted in "Poor" condition only.

EVALUATION OF ACCESSIBILITY

The potential for damage (i.e. accessibility) of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)	Common areas of the building within reach of all building users (approximately 8'-9' from floor level). Includes areas where occupant activities may result in disturbance of the material that is not normally within reach from floor level, but may be easily disturbed by common activities (e.g. gymnasiums, workshops, warehouses). Access A describes materials that could be readily disturbed.
Access (B)	Areas of the building accessed primarily by Maintenance/Caretaking/Janitorial Staff and materials within reach without use of a ladder. Includes areas within reach in Boiler Rooms, Electrical Rooms, Janitors Closets, Elevator Rooms, Mechanical Rooms, etc. Includes materials within reach from fixed ladders or catwalks, mezzanines and accessible pipe chases.
Access (C)	Areas of the building above 8'-9' from floor level where use of a ladder is required to reach the material. Includes materials that are not visible and require the removal of a building component to access and view, such as ceilings tiles, access panels and hatches. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls or equipment etc., where demolition of the ceiling, wall or equipment etc., is required to view the material. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials.

ABATEMENT PRIOIRTY MATRIX AND DEFINITIONS

ECOH's evaluation of the viability of a specific asbestos control option is based on the consideration of the condition, accessibility and visibility of the ACM. The logic used is that damaged ACM located in an area frequently accessed by all building occupants is of a higher priority than damaged ACM located in an infrequently accessed service area.

In any building with asbestos, current regulations require an Asbestos Management Plan to be implemented. Depending on the condition and the accessibility, more active measures such as repair or removal may be required. In the event of a building alteration, it will be necessary to remove ACM, regardless of condition, if it is likely to be disturbed by planned demolition, renovation or maintenance project activities.

ACM in "Good" condition is subject to surveillance at reasonable intervals, at a minimum, as long as it is not disturbed during planned demolition, renovation or maintenance project activities.

The following Abatement Priority Matrix Table establishes the recommended asbestos control action. Note that factors not included in the above discussion, such as an upcoming renovation, an owner's policy to remove material, knowledge of upcoming maintenance, etc., may result in a recommendation that is different from the table.

ABATEMENT PRIORITY MATRIX TABLE

The following table outlines the **abatement priority** decisions based on the relationship of **access** and **condition**:

Access	**Condition**			**Debris**
	Good	**Fair**	**Poor**	
(A)	Priority 3	Priority 1/2	Priority 1	Priority 1
(B)	Priority 3	Priority 2	Priority 1	Priority 1
(C)	Priority 3	Priority 3	Priority 2	Priority 1
(D)	Priority 3	Priority 3	Priority 3	Priority 2/3

Abatement Priority Definitions

The following definitions relate to the Abatement Priority Matrix Table presented above:

PRIORITY DEFINITIONS	
Priority 1	**Immediate Abatement Required** Restrict access that is likely to cause a disturbance of the damaged ACM or debris and repair/remove ACM or clean-up debris immediately. Utilize appropriate asbestos precautions. This action is recommended for compliance with regulatory requirements. The surveyor will immediately notify the WECHC of this condition.
Priority 2	**Abatement/Repair Required Within Specified Timeframe** At locations where damaged ACM is less likely to be disturbed, abatement can be performed on a lower priority basis (i.e. prior to any future disturbance).
Priority 3	**No Immediate Action Required** Remove ACM prior to demolition, renovation or maintenance projects utilizing appropriate asbestos precautions.