

The Environmental Abatement Council of Canada

Environmental Abatement and Indoor Air Quality: Update on Best Practices





Agenda

- Introduction to EACC Steve Fulford, BGIS
- Pre-Construction Guideline Steve Fulford, BGIS
- Indoor Air Quality Guideline Rob Robinson, Stantec
- Mould Guideline, Glenn Smith, Safetech
- Canadian Federal Asbestos Regulation, Mike Harrett, Pinchin
- Q&A





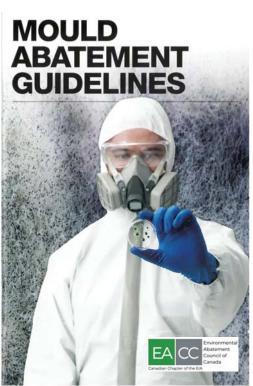
Who is EACC and what do we do?

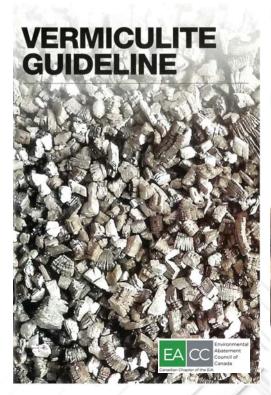
- The Environmental Abatement Council of Canada (EACC) is an organisation serving the environmental abatement industry, comprised of contractors, consultants, engineers, suppliers, government officials and others with an interest in the environmental abatement industry. We are the Canadian Chapter of the Environmental Information Association (EIA) in the USA.
- Our mandate is the promotion of the environmental abatement and hazardous materials industry.
- To promote high standards of conduct among our members.
- To collect and disseminate information regarding the management of hazardous materials including regulations from all provinces and territories
- Assist industry sectors by producing peer reviewed industry guidelines on specific topics where regulation do not exist or where additional information is needed



EACC Industry Guidelines











Pre-Construction Assessments

Designated Substances and Hazardous Materials





The Committee

- Representatives from the following firms:
 - Premier Environmental
 - Maple Environmental
 - MTE Consultants
 - GDH Limited
 - Environmental Services Group
 - EMSL Analytical
 - WSP Canada
 - Paracel Laboratories
 - Safetech

- Firstbrook Cassie Anderson
- Priestly Demolition
- Blumetric
- LiUNA Local 508
- Stantec
- ECOH
- Golder
- EHS Partnership
- Evelyn Stefov



The Reason

There are 3 main reasons that this document is required

- Consistency in the Industry
 - Wide spread of reports and content across the industry, making it difficult for contractors to price projects properly
- Clarification for building owners on their responsibilities
 - Many people use these documents as the scope of work for the abatement projects
- Protection of the workers
 - Properly identified materials and locations and consistent reporting will make it easier to protect the workers from the unknowns.



IHSA Demolition Sector Committee

- EACC sits on this committee as a guest to provide updates on EACC's committees and initiatives
- IHSA and the Ontario Ministry of Labour asked if EACC would prepare a guideline on Designated Substances and Hazardous Materials for the Demolition Sector
- EACC agreed and expanded the scope to include all construction/renovation projects, with all stakeholders approvals

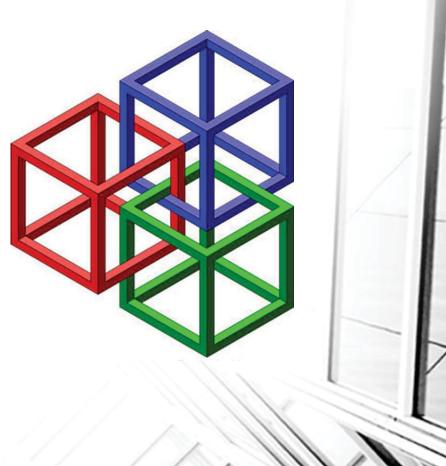






Intent of the Guideline

- EACC has developed this guideline to bridge the gaps between legislation, industry best practice, the most recent science and client directives
- There is significant variability in the content, scope, methodology, application and quality of these reports across the multiple industry sectors (abatement, construction/renovation, and demolition)
- EACC has developed this document to provide a framework for building owners, architects, engineers, consultants, and contractors to foster consistency in discussing and determining the scope of these assessments





Intent of the guideline

- This guideline is intended to be used:
 - By building owners to determine the scope for assessments,
 - By the environmental abatement industry to identify materials requiring abatement,
 - By the construction industry to identify materials requiring special handling/disposal,
 - By design professionals (e.g. architects, engineers, project managers) to make informed decisions based on cost, schedule and disposal requirements.





Limitations of the Guideline

- This document is not a step-by-step guide to preparing an assessment
 - A qualified professional should be retained for that purpose, but this guide will explain the reasons for these assessments and the information the assessment should contain based on the type of project to be undertaken.
 - The information and procedures identified are based on current and relevant legislation, the state of the sciences and <u>practical</u> experience.
- EACC is not responsible for the interpretation or use of the information contained within this document.
 - It is the responsibility of the user to determine whether the information contained herein is appropriate to the user's specific activities.





Why is this so important?

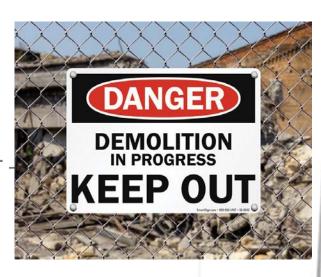
- These assessments are required by legislation when a project (e.g., construction, demolition, selective demolition, renovation) is planned, with no exemption for recent construction.
- These assessments are not required for ongoing operation and maintenance, but 0. Reg. 278/05 does require that an asbestos survey be completed for most buildings.
- Section 30 of the Occupational Health and Safety Act, R.S.O., 1990, c. O.1 (the Act) requires that an owner determine whether any designated substances are present at the project site and prepare a list of all designated substances identified.
- The list of designated substances must be provided to contractors as part of the tendering information so that they may comply with the Act.





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- 1. INTRODUCTION, GENERAL POINTS AND LIMITATIONS
- 2. REGULATIONS AND GUIDELINES
- 3. WHEN IS A PRE-CONSTRUCTION ASSESSMENT/SURVEY REQUIRED?
- 4. WHAT IS INCLUDED IN A PRE-CONSTRUCTION ASSESSMENT CONSTRUCTION VS. DEMO
- 5. SAMPLING AND ANALYTICAL CONSTRUCTION VS DEMO
- 6. REPORTING CONSTRUCTION VS. DEMO
- 7. WASTE CONSTRUCTION VS. DEMO
- 8. **DEMOLITION**





Appendices

- APPENDIX I DEFINITIONS
- APPENDIX II COMMON BUILDING MATERIALS CONTAINING DESIGNATED SUBSTANCES
- APPENDIX III POTENTIALLY HAZARDOUS MATERIALS WORTHY OF CONSIDERATION
- APPENDIX IV HISTORY OF DESIGNATED AND SELECTED HAZARDOUS SUBSTANCES



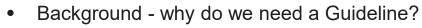


Environmental Abatement Council of Canada Indoor Air Quality Guideline

On behalf of the EACC IAQ Committee
Presented by
Rob Robinson, P. Eng.
Stantec Consulting Ltd.

Outline







- Use of the Guideline
- Key Reference Sources
- Table of Contents Key Section Overview
- Contaminants Table







The Committee



- Rob Robinson, Co-Chair, Stantec
- Richard Quennville, Co-Chair, T. Harris Environmental Mgt.
- Aisling Dennett, MTE Consultants Inc.
- Craig Maunder, Stantec
- Steve Booth, Pinchin
- Lydia Renton, Blumetric
- Sneha Panchal, EMSL
- Jill Grant, Pinchin
- Suzanne Wilde, Stantec

Background



- There are many standards, guidelines and publications related to indoor air quality in Canada and the US
- Current investigative approaches, application of relevant standards and reporting vary depending on the situation, the regulatory framework, and the investigator
- EACC identified the need to develop a home grown guide
- We are not re-inventing the wheel. The guide provides a concise view of important issues and approaches, and refers to what is available in much more detailed forms in the referenced literature.

The Guideline



- Educate and inform those that need a simple guide to resolve perceived IAQ concerns, and also to prevent them from occurring
- Assist employers, building owners, real estate management professionals, constructors, contractors, subcontractors, workers and regulators to better understand typical indoor air quality issues
- Overview of industry best practice used in both the assessment of indoor air quality issues and preventative measures
- Context of non-industrial workplaces, such as offices and schools and is not inclusive of occupational exposure limits

The Guideline



- Examines comfort parameters, irritants, typical contaminants including microbials, exposure pathways and provides guidance regarding acceptable airborne concentrations and possible mitigation strategies
- IAQ issues are generally very complex not meant to provide a comprehensive solution for all issues. Input from a multidisciplinary team - occupational hygiene professionals, engineers, medical professionals and building ventilation experts, is usually necessary
- The guide also provides a "How to hire a Professional" section

Key Reference Sources



- ASHRAE 55 (Thermal Comfort), 62 (Ventilation for Acceptable Air Quality)
- CSA Canadian Standards Association
- AIHA American Industrial Hygiene Association
- CaGBC Canada Green Building Council
- Well Building Standard
- Health Canada
 - Residential IAQ Guidelines
 - A Workers guide to AQ in Offices, Schools and Hospitals
 - IAQ in Office Buildings: A Technical Guide
- US EPA
 - Building Air Quality Guide for Building Owners and Facility Managers
 - I-BEAM Indoor Air Quality Building Education and Assessment Model
- Indoor Air Quality Tool Kit, Government of Alberta

Table of Contents



- Foreward
- Introduction to IAQ
 - Components of IAQ, Pollutants, Pathways, Pressures, People
 - Comfort thermal, irritants, perception, noise, lighting
 - Ventilation Systems
 - Odours
 - Contaminants carbon dioxide, carbon monoxide, microbials,
 PM, radon, VOCs, formaldehyde...

Contaminants Table

Carbon dioxide	Carbon monoxide	Particulate matter
TVOCs	Temperature	Relative humidity
Radon	Acetaldehyde	Formaldehyde
Ozone	Toluene	Benzene
Naphthalene	Nitrogen dioxide	Mould
Legionella	Asbestos	Lead

Substance of Concern	Suggested Limits	Reference Source(s)	Possible Human Health Effects (when Exposed to Levels Exceeding Suggested Limits)	Common Sampling/Monitoring Strategies
Carbon Dioxide (CO²)	Outdoor concentration + x ppm Value of x depends on specific type of indoor environment and occupancy, and can be determined as per ASHRAE 62.1 Appendix D No occupant complaints reported <800ppm, very frequent complaints occur >1000ppm	ASHRAE Standard 62.1 National Research Council of Canada - COPE Project Research Reports	Levels exceeding suggested limits are indicative of insufficient fresh air supply to building occupants. Such levels generally correlate with occupant dissatisfaction and negative health effects. levels can cause dizziness, headache, elevated blood pressure, increased heart rate, and may indicate that oxygen in air is being displaced, potentially leading to unconsciousness and death by asphyxiation (due to lack of oxygen), but this is typically not the foous of CO ₂ measurements during an IAQ assessment.	Direct-reading monitor (handheld or fixed, with 1ppm resolution)
Total Volatile Organic Compounds (TVOCs)	1 mg/m³ (target level) 5 mg/m³ (action level) 500 µg/m³	Health Canada: Indoor Air Quality in Office Buildings, a Technical Guide Canada Green Building Council: LEED ID+C: Commercial Interiors, Gredit 3.2: Indoor Air Quality Assessment, International Well Building Institute: WELL Building Standard – Air Quality Standards	VOCs can cause a wide variety of acute and chronic health effects depending on factors including length and level of exposure to the VOC(s). VOCs typically depress the central nervous system, leading to nausea, headache, difficulty concentrating, feelings of intoxication, drowsiness, etc. Exposure to some specific VOCs (e.g. benzene, formaldehyde) is linked to cancer in humans. Exposure to a number of VOCs at high concentrations (more typical found in industrial environments) can also cause damage to liver and kidneys.	Direct-reading monitor (PID with detection limit in the ppb range for TVOCs) Methods to identify specific VOCs include: Open characterization via sorbent tube or Summa cannister Air sampling via sorbent tube (analysis via EPA Method TO-17) Air sampling via Summa cannister (analysis via EPA Method TO-15)
Formaldehyde	40 ppb (8 hr. avg.) 100 ppb (1 hr. avg.) 27 ppb 100 ppb (15 min avg.)	Health Canada - Residential Indoor Air Quality Guidelines Canada Green Building Council: LEED ID+C: Commercial Interiors, Credit 3.2: Indoor Air Quality Assessment, International Well Building Institute: WELL Building Standard - Air Quality Standards Ontario Regulation 833 - 10% of the short-term exposure limit (maximum allowable	Respiratory symptoms, eye, nose, and throat irritation, cough, wheezing. Formaldehyde exposure linked to lung and nasopharyngeal cancer.	Direct reading monitor (w! 11.7 eV PID, or electrochemical sensor) Passive sampling badges/dosimeters Active air sampling with silica gel cartridges
	150 ppb	exposure over any 15 minute period) Ontario Regulation 833 - 10% of the ceiling value occupational exposure limit (maximum allowable instantaneous exposure)		

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 - Proactive Assessments
 - Reactive Assessments
 - HVAC Assessments

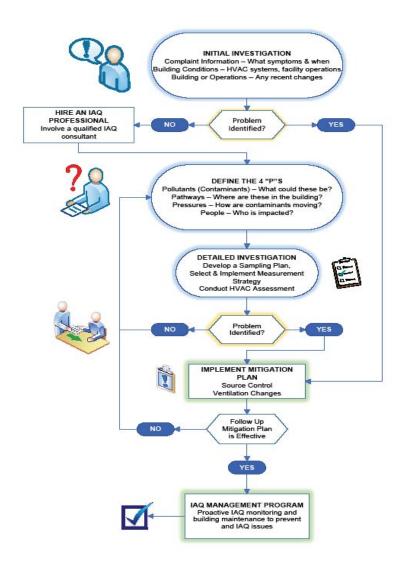


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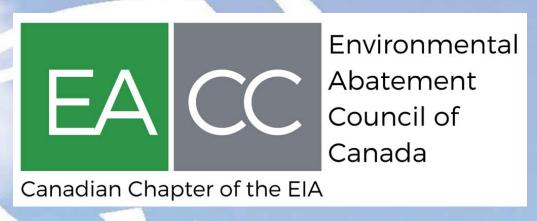
Next Steps

EA CC Environmental Abatement Council of Canada

Canadian Chapter of the EIA

- Committee actively working
- Release March, 2019

Mould Remediation Guideline Update 2018



Presented by:

D. Glenn Smith, B.SC. (HE), CRSP, AMRT
Mould Committee Chairman
Environmental Abatement Council of Ontario

Outline

- Review of Mould Industry
- Mould Remediation Guidelines
- EACC Mould Committee
- EACC Guideline Update 2015
- CCA Guideline Update 2018





MOULD REMEDIATION GUIDELINES

- Original Guideline from New York City
 Department of Health was used widely
- First designed in 1993
- Mould issues in Canada late 1990s
- Need for provincial and national guidelines
- Guidelines for new construction
- Guidelines for existing buildings



MOULD REMEDIATION GUIDELINES

 Canadian Construction Association – "Mould Guidelines for the Canadian Construction Industry" (2004).



 Environmental Abatement Council of Canada – "Mould Abatement Guidelines" (2015).



• IICRC S520 – "Standard and Reference Guide for Professional Mold Remediation" (2015).







Mould Remediation Guidelines



EACC Mould Abatement Guideline

- Originally designed to assist building owners, constructors, contractors, sub-contractors
- Ensure compliance with OH&S Act and Regulations - Ontario
- Original version issued in 2004





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EACC Mould Abatement Guideline

- Several updates over the years
- Last update in 2015
- Committee of contractors, suppliers, insurance professionals and consultants completed the review
- Several changes to update the document to current industry practices





Mould Remediation Guidelines [EA] COLUMNIC PROPERTY CONTROLL PROPE



EACC Mould Abatement Guideline

- Edition 3 2015, last update in 2015
- Revisions to wording and content to ensure compliance with updated OH&S Acts and Regulations



Canadian Chapter of the EIA

- Ensured compliance with Ontario Regulation 278/05
- Appendices added for members on abatement of bird/bat droppings, unsanitary water Environmental conditions and abrasive blasting Abatement Council of Canada



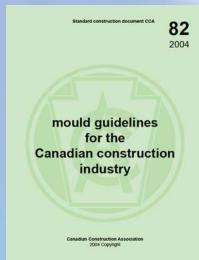
Mould Remediation Guidelines [EA] Capable of the EA



Canadian Construction Guideline

 Originally designed to assist contractors on new construction projects

- Ensure compliance with OH&S Act and Regulations across Canada
- Original version issued in 2004
- Large committee of major industry
- stakeholders
- Several years to design and implement









Mould Remediation Guidelines [And Compared to the Enterior Constitution of the Enterior Constitution of



Canadian Construction Guideline

- Not updated since 2004
- EACC mould committee commissioned to update CCA guideline in 2018
- 6 month process
- Majority of recommendations accepted by CCA









Mould Remediation Guidelines [August Control of Control



Canadian Construction Guideline

- EACC committee recommended numerous changes to document
- Changes brings documents up to current industry standards and best practices
- Required input from numerous professionals including mould experts, occupational hygienists, laboratory professionals, and professional engineers







Mould Remediation Guidelines [Audithors of the Environmental Audithors of the Environmental A



Canadian Construction Guideline

Updated aspects of the document to reflect the current mould remediation industry including such items as mould remediation resources, legal overview and insurance to name a few.



- Original version took into consideration experience from the USA
- Legal and insurance approaches quite different compared to Canada





Mould Remediation Guidelines [Example of the Example of the Exampl



Canadian Construction Guideline

- Replaced the mould remediation section with EACC's recent mould remediation section which was recently updated in 2015.
- Allows for a more standardized approach
- EACC guidelines being used by professionals in other provinces









Mould Remediation Guidelines Example Constitution and Constitution Con



Canadian Construction Guideline

- Updated tables and checklists including removing the existing checklist (Appendix A) and replacing with a "Tip Sheet" format.
- Provides guidance to constructors and project managers on how to conduct a preliminary assessment
- Focuses on basics of water damage and mould contamination
- Expanded appendices contents, resources and definitions







Mould Remediation Guidelines [Acceptable of Control of



Conclusions

- Both guidelines being used widely throughout Canada
- Do not anticipate any mould abatement regulations provincially or national
- Do not anticipate any changes in the years upcoming
- Presence of mould will continue to be a concern in buildings and construction related projects





Federal Asbestos Regulations

Presented by:

Michael Harrett, C.E.T.

Regional Practice Leader, Hazardous Materials

November 29, 2018

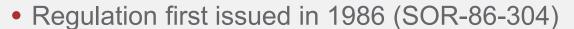
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Canada Occupational Health and Safety Regulations

made under the Canada Labour Code



- Generic, with little detail (for asbestos, or any other hazard)
- Draft amendments issued December 2016
- 45 day commentary period
- Very little consideration to stakeholder comments
- Effective July 12, 2017









CONSOLIDATION

CODIFICATION

Canada Occupational Health and Safety Regulations Règlement canadien sur la santé et la sécurité au travail

SOR/86-304

DORS/86-304

Current to January 30, 2018

Last amended on June 20, 2017

À jour au 30 janvier 2018

Dernière modification le 20 juin 2017

Published by the Minister of Justice at the following address: http://laws-lois.justice.gc.ca Publié par le ministre de la Justice à l'adresse suivante http://lois-laws.justice.gc.ca



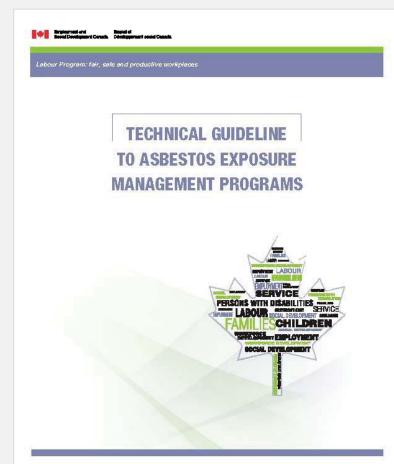
Technical Guideline







- Issued January 16, 2018
- Purpose "to provide guidance on asbestos issues relating to Part X of the COHRS and relevant provisions on other Regulations of the Canada Labour Code, Part II."





Canada

Who does the Federal Regulation apply to?







- Regulation applies to sites containing federal workplaces, federal workers and federal employers
- Includes workplaces that are owned by provincial landlord, but occupied by federal workers and employers, (e.g. bank in a shopping mall)
- Since most work is carried out by provincially regulated contractors, both federal and provincial regulations require consideration and coordination
- Best practice is to follow more stringent requirement if overlapping or conflicting





Summary of Major Changes to the Canada Labour Code







- Lowered allowable exposure limit to 0.1 asbestos fibres per cubic centimeter
- Defined asbestos-containing material at 1%
- Clarified requirement for an Preconstruction Hazard Assessment, and created a requirement for Asbestos Exposure Management Program
- Defined work classifications (Low, Moderate, High)
- Mandatory air sampling during abatement and clearance





Asbestos Definition by Jurisdiction







% Asbestos by Weight			
Presence	0.1%	0.5%	1%
BC (Vermiculite) Alberta*	Quebec Manitoba (friable)	Ontario BC Nova Scotia Saskatchewan (friable)	Federal Manitoba (non-friable) Saskatchewan (non-fria New Brunswick Newfoundland PEI NWT Yukon Nunavut



*Asbestos is not defined as a percentage in Alberta, any asbestos must be assessed on a case-by-case basis

Is 1% too High?







- What materials could be missed at 1%?
 - Vermiculite
 - Plaster
 - Drywall joint compound
 - Ceiling tiles
- These materials could be non-asbestos under federal, but asbestos under provincial







Asbestos Exposure Management Program (Assessment)







Part 1 – Assessment

- If potential for employee exposure exists, conduct a hazard investigation (e.g. Asbestos Assessment Report)
 - Location of asbestos
 - Type of asbestos
 - Condition
 - Friability
 - Accessibility
 - Potential for release of asbestos and likelihood of damage
- Report must be available to employees and H&S committee
- Must be kept for 30 years.



Asbestos Exposure Management Program (Assessment)

Part 2 – If Disturbing Asbestos







- Classify Risk Level (Low, Moderate, or High-risk)
- Ensure safe work procedures for moderate and high risk work are developed and implemented
- Identify any exposed asbestos or asbestos in the work place that will be disturbed with signs or labels, or by any other effective manner.





Low Risk Activities







Handling of ACM or carried out in proximity to non-friable ACM

- Removal of <7.5 m² of non-friable asbestoscontaining ceiling tiles
- Removal of non-friable materials without breaking, or generating dust.
- Disturbance of non-friable materials using hand tools and wetting.
- Removal of <1 m² of drywall with asbestos joint compound
- Removal of <2m² of friable asbestos-containing ceiling tiles, or are in close proximity to friable ACM, without breaking.





Moderate Risk Activities







Handling of ACM or carried out in proximity to friable ACM, and not otherwise defined as Low or High Risk.

- Contaminated ceiling entry
- Removal of <1 m² of friable asbestos
- Enclosing friable ACM
- Repairing ACM pipe or boiler insulation
- Removal of >2m² of friable asbestoscontaining ceiling tiles, or are in close proximity to friable ACM, without breaking.
- Disturbance of non-friable ACM is not wetted. but only hand tools are used.

- Removal of >1 m² of drywall with asbestos joint compound
- Disturbance of non-friable ACM using HEPA filtered power tools
- Removal of asbestos insulation with a glovebag
- Removing filters in HVAC equipment where sprayed-on fireproofing is present
- Removal of >7.5 m² of non-friable ceiling tiles



High Risk







Handling of friable ACM or carried out in proximity to friable ACM, that requires a high level of control



- Removal of >1m² of friable asbestos, even if divided into smaller jobs.
- Spray application of sealant to friable asbestos.
- Cleaning or removing HVAC, other than filters, in building with ACM spray fireproofing
- Repairing, altering, demolishing kiln, furnace, similar structure that contains ACM.
- Disturbance of non-friable asbestos with power tools without dust collection.
- Demolition of building used to manufacture asbestos products, unless previously cleaned.
- Removal of friable ceiling tiles if breaking or cutting



Air Sampling



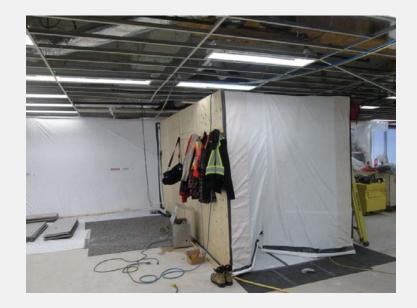




During asbestos removal work, air samples must be collected:

Applies to Moderate Risk with containment and High Risk work only

- Outside the containment (2 samples minimum), daily
- Inside the clean room (if present), daily
- Inside the containment, as necessary.





Air Sampling

Clearance:







For all Moderate and High Risk enclosures

- Prior to dismantling the containment
- Use forced air to dislodge fibres
- Clearance criteria is 0.01 f/cc using NIOSH 7400 Method





Prohibition of Asbestos and Asbestos Products Regulations







Canadian Environmental Protection Act

- Registered September 28, 2018
- Issued October 17, 2018
- Effective December 30, 2018
- Prohibits manufacture, import, sale and use of asbestos and products containing asbestos, with limited exemptions.
- Does not apply to asbestos integrated into a structure, infrastructure, vehicles, etc. before December 30, 2018
- Regulation does not restrict raw asbestos and products in transit through Canada.



Prohibition of Asbestos and Asbestos Products Regulations







Canadian Environmental Protection Act

- Does not apply to Mining, except for certain High Risk activities:
 - Mining residues cannot be used for construction or landscaping, unless authorized by the province.
 - Mining residues cannot be used to manufacture a product that contains asbestos.
- Legal under the regulation
 - Transfer of asbestos for disposal
 - Reuse of asbestos in existing road infrastructure (i.e., milling asphalt).
 - Import, sale and use of military equipment serviced oversees with asbestos (if there were no technically or economically feasible asbestos-free products available)
 - Museums (exhibits) and laboratories (controlled use)



Prohibition of Asbestos and Asbestos Products Regulations







Canadian Environmental Protection Act

- Phased out use
 - December 31, 2022 Use of products containing asbestos to service equipment in a nuclear facility or to service military equipment (if there are no technically or economically feasible asbestos-free products available)
 - December 31, 2029 Use of asbestos diaphragms in the chlor-alkali industry¹
 - Permitting application to be in place for unforeseen circumstances, and nuclear/military use, beyond 2022.
- For all approved ongoing use, Asbestos Management Plans must be developed.









Questions?

