Services de santé environnementale et publique
dans les communautés des Premières Nations

Environmental Public Health Services
In First Nations communities

Healthy Homes, Healthy Air
Indoor Air Quality in First Nations Housing

Amy Montgomery, CIPHI(C)
Senior Environmental Public Health Officer
Thunder Bay, Ontario

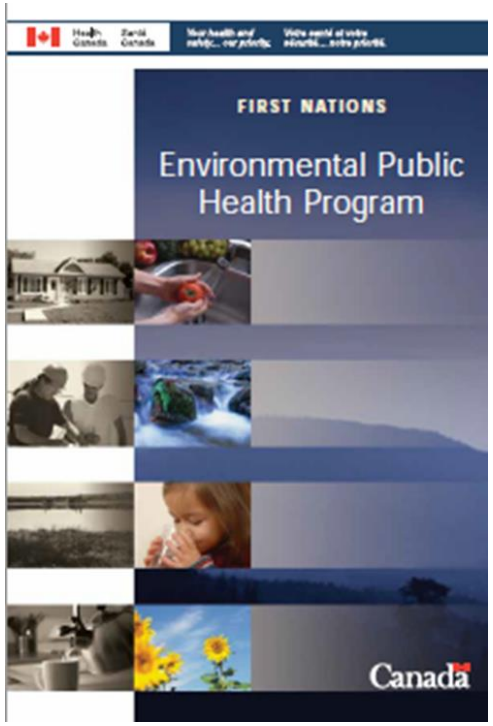
Traditional lands of the Fort William First Nation, Signatory to the Robinson Superior Treaty of 1850

Government of Canada
Gouvernement du Canada

Canada

Guiding Principles

The Environmental Public Health Program works to **identify and prevent environmental public health risks that could negatively impact the health of First Nations** community residents, and to recommend corrective actions to reduce these risks.



Guiding Principles

1. **Work with First Nations communities as active partners** in the Environmental Public Health Program.

2. **Collaborate** with public health workers, provincial and local health authorities, First Nations organizations and other federal, provincial and municipal departments and agencies when delivering environmental public health programming in First Nations communities.

3. **Strive for a level of on-reserve environmental public health services** that is comparable to that available off-reserve and consistent from region to region.

Role of Environmental Public Health Officers (EPHO)

- EPHOs (formerly known as EHOs) provide advice, guidance, education and public health inspections to First Nations to help manage public health risks associated with the environment.
- Gather and analyze data to promote public health in First Nation communities
- Can be employed by Indigenous Services Canada **or** First Nation organizations
- EPHOs must be certified with the **Canadian Institute of Public Health Inspectors**

Services de santé environnementale et publique
dans les communautés des Premières Nations

Environmental Public Health Services
In First Nations communities

Role of Environmental Public Health Officers

1. Drinking Water
2. Food Safety
3. **Health and Housing**
4. Wastewater
5. Solid Waste Disposal
6. Facilities Inspection
7. Communicable Disease Control
8. Emergency Preparedness & Response

https://youtu.be/QCUX0ktqPi4?si=OAw0G6gNCzYRNI4w

EPHOs' Role in Community Housing

HEALTH AND HOUSING

A healthy home means that residents have the physical and social conditions necessary for health, safety, hygiene and comfort. The Environmental Public Health Program works with First Nations communities and other agencies to help address public health issues in housing.

Activities

1) ENVIRONMENTAL PUBLIC HEALTH ASSESSMENT

- Provide public health inspections of on-reserve public/social housing upon request. Inspections may include evaluation of indoor air quality, contaminants, pest control, water supply, solid and liquid waste disposal, general safety, structural defects and overcrowding.
- Review plans from a public health perspective for new housing developments and renovations.
- Provide advice, guidance and recommendations to Chiefs, Councils, community workers and occupants related to all stages of housing: site and design, construction, occupancy and demolition.

2) PUBLIC EDUCATION

- Provide public education to Chiefs, Councils, community workers and occupants about how to maintain a safe and healthy home.

3) TRAINING

- Provide training sessions upon request on public health issues related to housing.

Why Indoor Air Quality (IAQ) Matters

- We spend most of our time indoors
- Indoor air can contain harmful contaminants
- Poor air quality affects health

What Is Indoor Air Quality (IAQ)?

- The air inside homes and buildings
- What we breathe every day
- How clean or contaminated the air is

Common Indoor Air Contaminants

Second Hand Tobacco smoke

Dust and dust mites

Mould spores

Chemicals (VOCs, formaldehyde)

Gases like carbon monoxide and radon

Common Indoor Air Contaminants

Identify contaminants in home – research if unsure

What is the source of the contaminants (can we remove or eliminate)?

Ventilation (fans, HRV, open window)

PPE/Renovation/WETT inspection upgrade

How Contaminants Affect Our Health

- Enter our lungs when we breathe;
- Our stomach/intestine when we eat foods where these particles have settled;
- Through our skin when we touch surfaces where these particles have settled.

People respond in different ways, depending upon the amount of exposure and the person's overall health

Some effects may only be apparent after a period of repeated exposure (such as radon), while others may have immediate effects (such as carbon monoxide)

Health Effects

- Wheezing
- Coughing
- Sneezing
- Eye, nose, throat irritation
- Asthma attacks

Small Actions and Habits Matter

- Remove shoes indoors
- Change work clothes
- Reduce contaminants entering the home

Winter – Indoor Air Quality

The more time spent inside your home will lead to more exposure to the indoor air…

(Winter or even Fall - and yes even our Spring)…

Second Hand Tobacco Smoke

Health risks from second-hand smoke

Second-hand smoke is the combination of smoke coming directly from a burning tobacco product and the smoke exhaled by a person smoking.

People exposed to second-hand smoke are at increased risk for:

- heart problems, lung cancer, breathing problems (like more severe asthma), excessive coughing, throat irritation, premature death

Children exposed to second-hand smoke are at increased risk for:

- respiratory illnesses, more frequent and more severe asthma attacks (among children with asthma), ear infections, phlegm, wheezing, and breathlessness, decreased level of lung function
- Children are especially at risk from second-hand smoke, because their breathing (respiratory) and immune systems are still developing.

Pregnant women exposed to second-hand smoke during pregnancy are at increased risk of problems with their health and the health of their unborn baby. They are also at increased risk of having a low birth weight baby.

- **Infants** exposed to second-hand smoke or whose mother smoked during pregnancy are at increased risk for sudden infant death syndrome (SIDS).

Dust Mites

- Dust mites are microscopic organisms
  - live in beds, carpets, furniture, plush children's toys, and anywhere that dust accumulates
  - Found everywhere – indoors and out

- Dust Mites can cause allergic reactions and aggravate pre-existing health conditions, such as asthma
  - Children and toddlers are at greater risk, as they may accidentally swallow or inhale dust during normal daily activities

Dust Mites

-Clean floors and surfaces with a damp mop/cloth

-Reduce clutter

-Vacuum carpets, curtains, and soft furnishings (HEPA filter recommended)

-Improve ventilation and maintain 35–50% humidity

-Use a dehumidifier in damp areas

-Encase pillows/mattresses in dust-mite-proof covers

-Wash bedding weekly in hot water

-Discard wet or damp items

What is Mould?

Mould is the common word for any **fungus** that grows on food or damp materials. Mould can be black, white or almost any colour. It often looks like a stain or smudge and it may smell musty.

- Releases "spores" into the air which are small enough to be inhaled
- Can negatively impact your health if inhaled in high enough concentrations

Conditions for Mould Growth

In order for mould to grow you need:

1) **Relative Humidity** - of 50% to 70% or higher
2) **Moisture** (plumbing leaks, condensation, flooding)
3) **Time** (material must be wet for >48 hrs)
4) **Food source** (dust, drywall, cardboard, cellulose, insulation, wood, fabric, etc.)

Mould

- Wheezing
- Coughing
- Sneezing
- Eye, nose, throat irritation
- Asthma attacks

Visual inspection helps determine whether mould is small, medium, or large. This helps guide cleanup and next steps.

Investigation and Inspection

Visual Inspection

Identifying damp areas or where water damage has occurred

Sampling

Sampling is not recommended as it doesn't change the outcome

Mould Testing and Sampling

- Testing for mould is usually NOT necessary.
- Mould must be cleaned regardless of type.

Why Testing Is Not Recommended

- Does not explain health risk
- Does not show mould extent
- Delays cleanup
- Resources better spent fixing moisture

What to do?

The best way to reduce the health risk is to remove the moisture source and clean up the mould

Cleaning Up Mould

- Before beginning any mould clean-up take steps to ensure that you do not expose yourself or others to mould spores.

- Recommended PPE
  - Mask (N95 or better)
  - Safety glasses or goggles
  - Rubber gloves

- As a precaution during clean-up, children, the elderly and sensitive people such as those with asthma, allergies or other health problems should leave the house. Consult your physician if in doubt.

Cleaning Up Mould

Small Areas (< 1 m^2)

Areas that are less than the size of a standard large garbage bag folded in half (1 square metre).

- Put on protective wear including a long sleeve shirt, appropriate and properly fitted mask, safety glasses or goggles and rubber gloves.
- Prepare a bucket with water and dish detergent (unscented) and another with clean water. For cleaning drywall, can use baking soda instead of dish detergent.
- Wipe with soapy water and then quickly dry afterwards
- Replace porous or absorbent materials (such as ceiling tiles, upholstery and carpeting) that are mouldy or badly damaged

Cleaning Up Mould

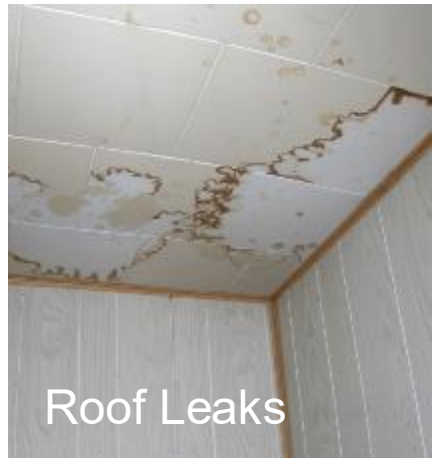
Medium Areas (>1 m^2 but <3m^2)

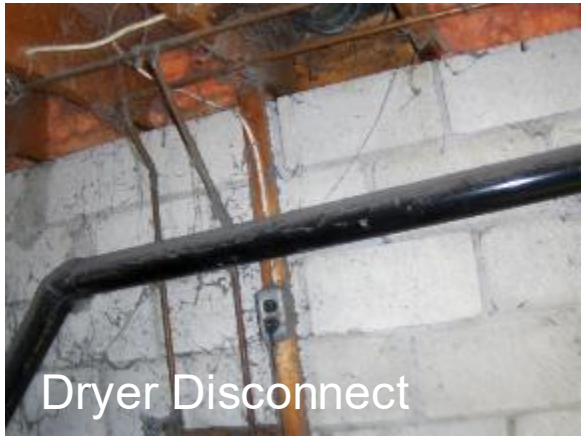
- Can be multiple patches but total mould area is less than 3m^2 (patches close together are considered 1 patch)
- In many cases professional help is needed to take care of medium amounts of mould but the cleaning may be able to be completed with proper training and precautions

Larger Areas (> 3m^2)

- Large areas of mould should be left to contractors who are trained to deal with mould assessment and cleanup

Areas at High Risk of Mould Growth





Windows

Condensation on surfaces due to excessive humidity, lack of ventilation, or low temperature

Results in Mould Growth

Under counter plumbing

Water Leaks

Plugged/Clogged Vents

How to Prevent Mould

Control Moisture and Humidity!

Check and Stop Leaks

- Home foundations, walls, windows, roof, plumbing, tubs and sinks

Ventilation

- Use Exhaust fans or open a window when showering or cooking
- Check clothes dryer, bathroom and kitchen fans, stoves, and oil or propane heaters to be sure they are vented outside and connected.
- Ensure vents are not blocked
- **Turn ON and use your HRV**

How to Prevent Mould

Control Moisture and Humidity!

Reducing clutter and removing sources of moisture

- Reduce the amount of stored materials, especially in the basement and crawlspaces
- Throw out wet and badly damaged items.
- Do not store firewood inside the home.
- Remove carpet in bathroom and basements.

Stopping water from entering the foundation

- Install downspout extensions to take rainwater and melted snow away from the home
- Make sure eaves, troughs, roof gutters and downspouts are connected and working. Clean and repair regularly.
- Ground sloped away from the home foundation

What is Radon?

- Naturally occurring radioactive gas
- Colourless, tasteless, odourless
- Produced from decay of uranium present in soils and rocks

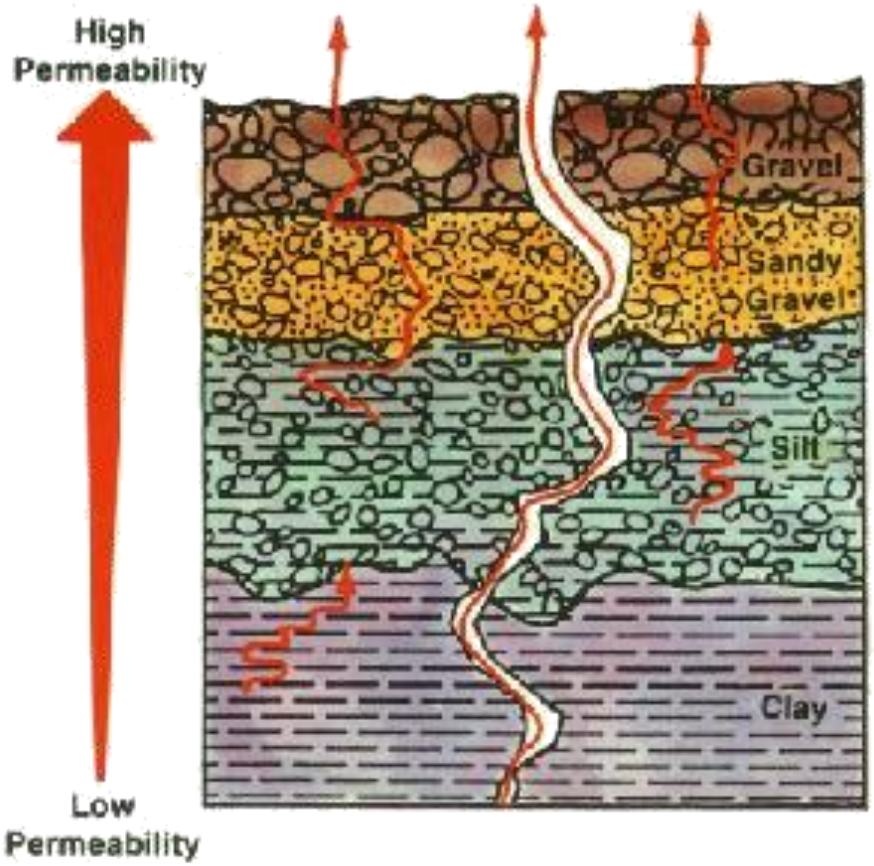
you can't see it, you can't smell it, you can't taste it

In Canada (and elsewhere) radon is measured in the SI units of becquerels per cubic metre (Bq/m^3).

In the USA, radon is measured in picocuries per litre (pCi/L)

1 pCi/L = 37 Bq/m^3

Radon is released from soil…into our Indoor Environment



- As uranium deposits in soil decay, radon gas is produced
- Radon gas can easily move through permeable soils such as sand and gravel
- Radon is soluble in water and can be found in groundwater from small wells
- Radon released into the atmosphere is diluted to low concentrations (10-15 Bq/m^3)

How Radon Enters a House?

- Any cracks, openings or gaps in foundation walls or floors provide route(s) of entry into home
- The air pressure inside a house is normally lower than the pressure underneath or around the foundation.
- This difference in pressure acts like a vacuum drawing radon in through foundation cracks and other openings.
- Once inside the home, radon can build up to dangerous levels

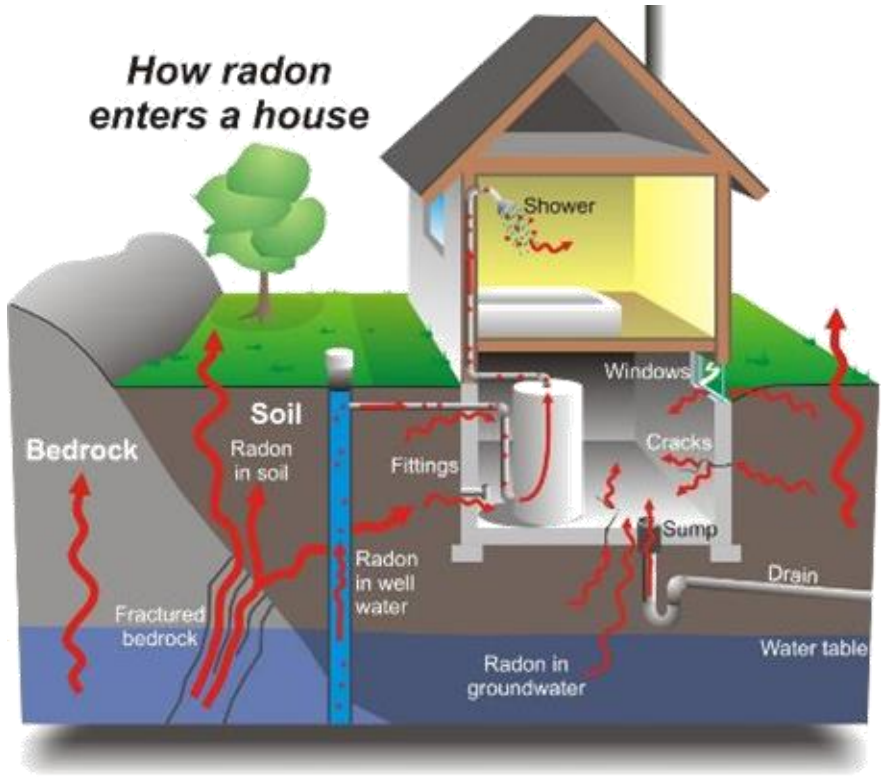


Image: Courtesy of the Department of Natural Resources Canada

What factors affect Radon levels in a house ?

Indoor radon levels vary greatly, even over a 24 hour period!

- Amount of uranium in the ground
- Weather
- Soil type and moisture
- Foundation design and construction materials used
- Number and size of openings in foundation
- Heating and ventilation
- Occupancy patterns

Two identically built houses side-by-side can have different indoor radon levels

Radon and Health

- The known health effect of radon exposure is risk of developing **lung cancer**
- In Ontario, approximately 13.6% of lung cancer deaths are due to radon exposure (850 deaths per year)
- Only beaten by smoking as the main cause of lung cancer

Radon – Federal Guidelines

New guideline introduced in 2007:

"*Remedial measures should be undertaken in a dwelling whenever the average annual radon concentration exceeds 200 Bq/m^3 in the normal occupancy area*"

"Dwelling" includes residential homes, and buildings with a high public occupancy rate such as schools, hospitals, long-term care residences, and correctional facilities

Normal Occupancy =
Occupied for greater than 4 hours per day

How to Test for Radon

Two options:

1. Hire a certified radon measurement professional

2. Purchase a long term, do-it-yourself test kit
(available online, over phone, and some retail stores)

Health Canada recommends using long-term test device, for a minimum of 3 months, ideally during the fall and winter seasons

Measurements gathered over a longer period of time will provide a better estimate of the annual average exposure

Radon Test Devices

- **Electret Ion Chamber**

- **Alpha Track Detector (ATD)**

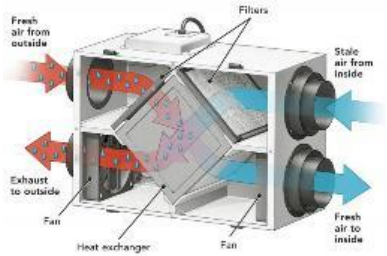
- **Continuous Radon Monitor (CRM)**

200 - 600 Bq/m³
fix your home
within 2 years

Above 600 Bq/m³
fix your home
within 1 year

How can you reduce Radon levels?

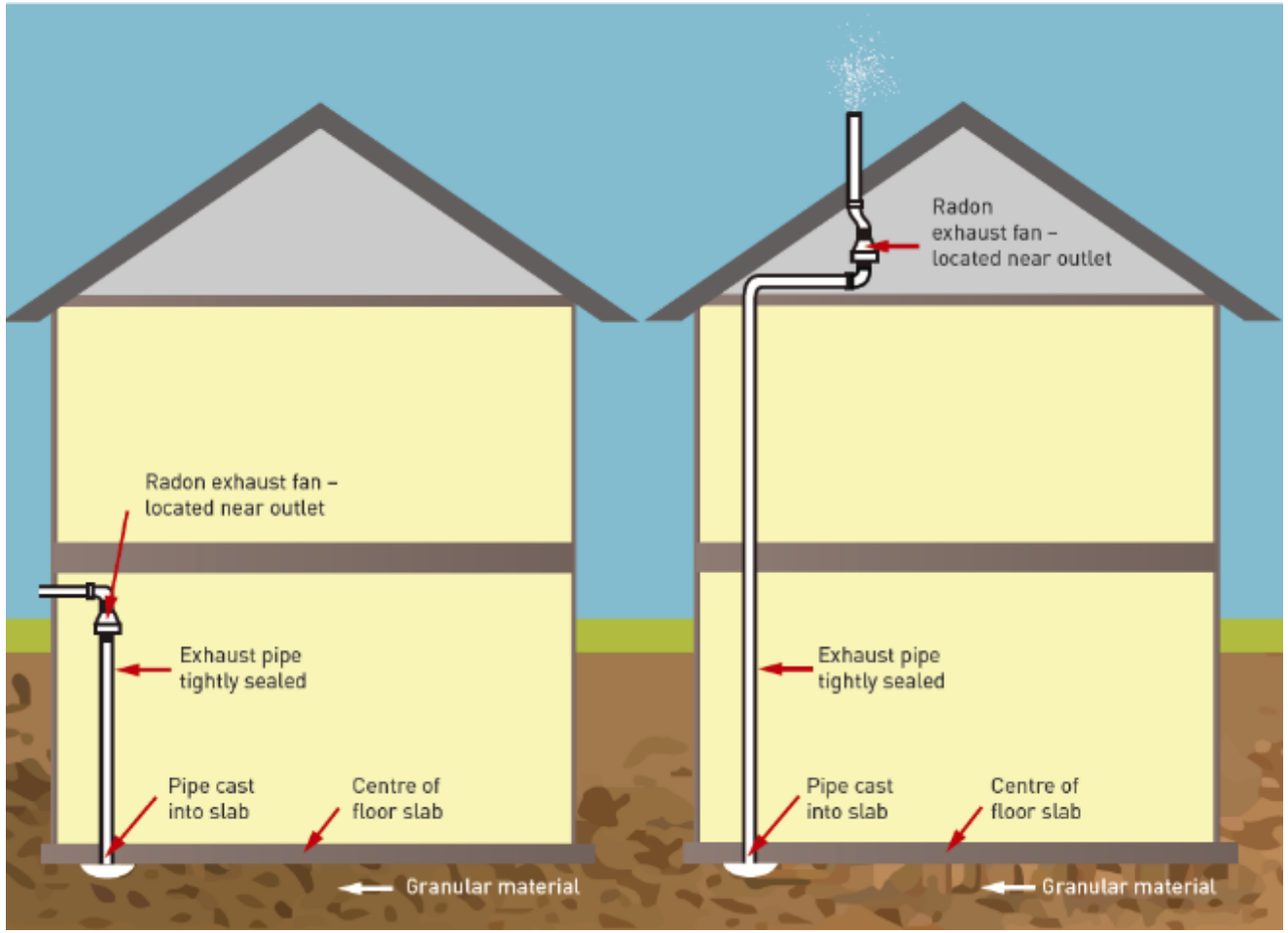
- Hire a C-NRPP certified radon mitigation professional
- The most effective radon reduction method is called **Active Soil Depressurization** – typically done by a contractor
- Other actions that can be taken to reduce radon:
  - Increase the balanced exchange of air – air exchanger or HRV
  - Seal radon entry routes - cracks in the foundation, sump holes, gaps around pipes and drains



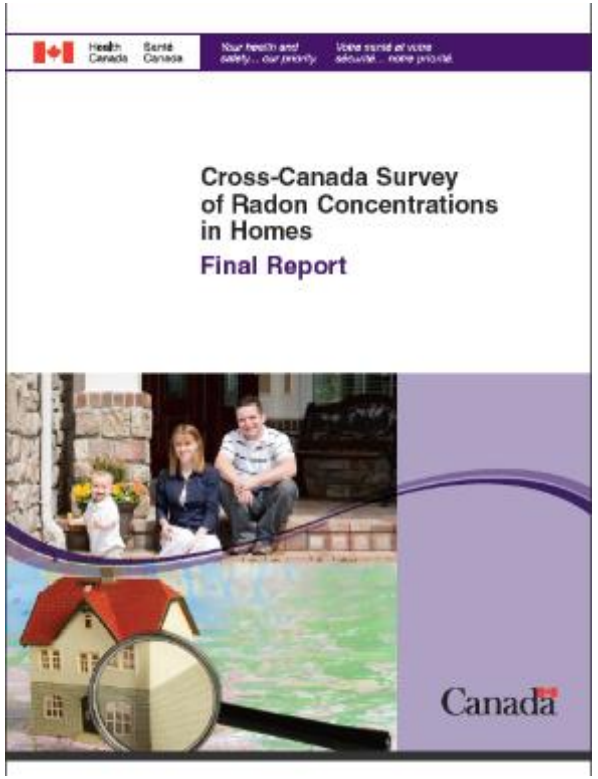
Active Soil Depressurization (ASD)

- Involves installing a pipe and fan that draws the radon from below the house and pushes it to the outside before it can enter your home

- Typically leads to radon reductions of 90%+



Cross Canada Residential Survey of Homes - RADON SURVEY



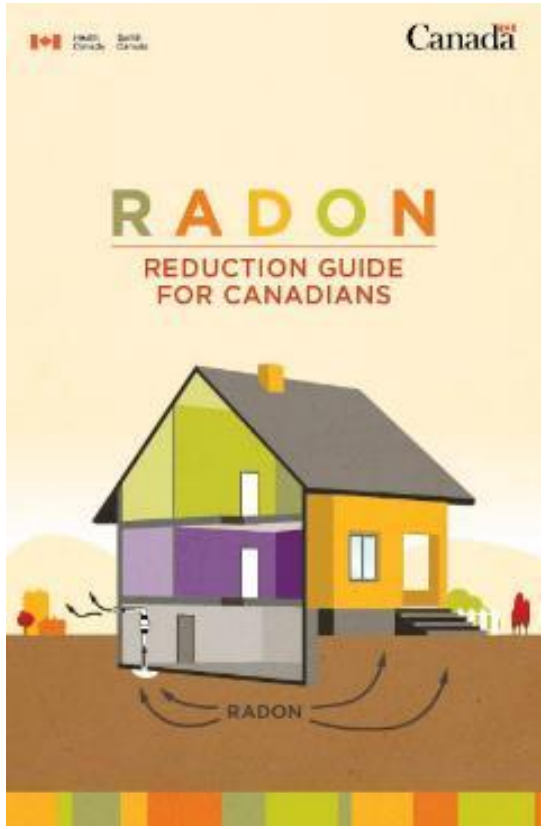
- From 2009 to 2011, we have surveyed approximately 14,000 homes across Canada
- About 95% of Health Regions that participated had homes tested above the Canadian guideline of 200 $Bq/m^{3.}$ (There are no radon free areas.)
- Approximately 7% of Canadian homes exceeded the Canadian guideline

National Building Code of Canada - 2010

In 2010, major changes were introduced in Canada's National Building Code for protection against radon ingress

Applies to <u>all new housing</u> and small buildings:

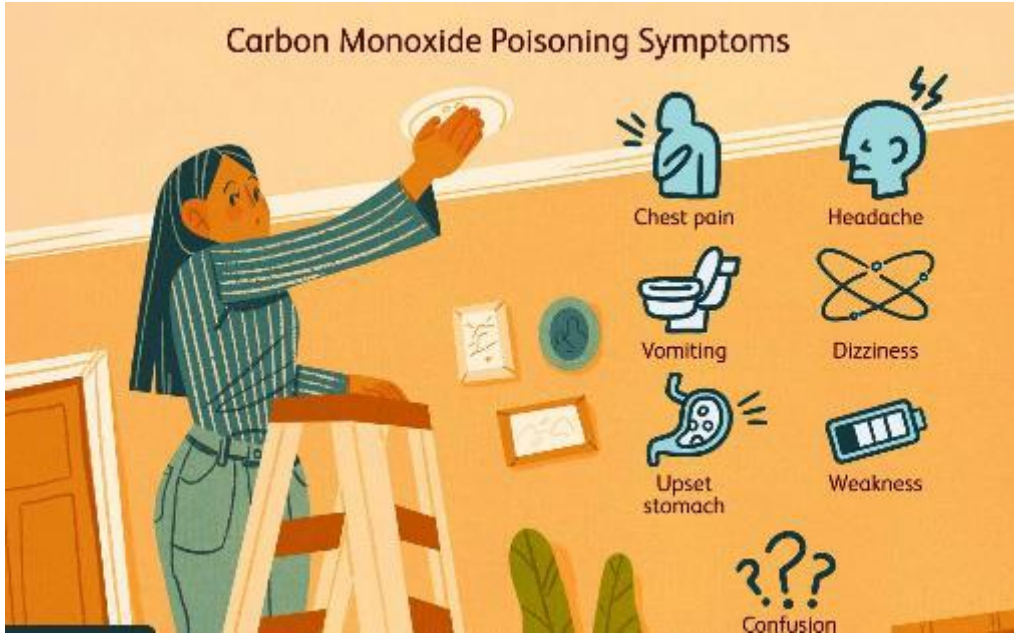
- ✓ Polyethylene soil gas barrier required under slab
- ✓ Slab perimeter sealed to air barrier of the wall
- ✓ All penetrations (mostly pipes) sealed
- ✓ Sump pit cover required to be airtight



Indoor Air Quality – Carbon Monoxide

What is it?

- An odorless, tasteless, colorless gas
- Only detectable by a carbon monoxide alarm



<u>Dangerous!</u>

- Can cause coma or death at high enough levels
- Lower levels can cause dizziness, headaches, tiredness, shortness of breath
- Ask people if they get seasonal symptoms…

Indoor Air Quality – Carbon Monoxide

Main Source = Combustion

Vehicles

- Cars, Trucks, ATV's, Motorcycles

Any fuel burning appliances

- Wood, charcoal, propane or oil stoves
- Furnaces
- Generators
- Lawnmowers
- Snowblowers

Indoor Air Quality – Carbon Monoxide

Prevention

- CO Detector
  - Not just your house, anywhere you run equipment in an enclosed space
  - Workshops, Sheds, Garages, etc.

- Ventilation
  - Ensure Vents are not blocked by snow or debris
  - Clean as needed

- Inspection of Appliances
  - WETT Inspections
  - Leaks
  - Cracks
  - Broken or torn tubes or pipes

Formaldehyde in Indoor Air

- **Off-gassing** from building/renovation materials and furniture:
  - Glues, paints, varnishes, floor finishes, wallpaper, cardboard, paper products, permanent press fabrics (drapery)
  - Composite wood products: particleboard, MDF, plywood
- **Combustion (burning materials):**
  - Tobacco smoke, Gas/oil appliances (improperly vented), Fireplaces, wood stoves, Vehicle exhaust from attached garages

Reducing Exposure:

- Off-gassing decreases over time, the hotter it is the faster it will be released
- Will be higher in new homes

Health Effects:

- Irritates **eyes, nose, throat**
- Can worsen **asthma** (esp. children)
- Classified as **carcinogenic** (high exposure, industrial settings)

Environmental Public Health Officer (EPHO) Career Outreach

First Nations Inuit Health Branch,
Indigenous Services Canada

What is Environmental Public Health and what do Environmental Public Health Officers (EPHO) Do?

- Environmental public health refers to conditions in the environment, both natural and human-built, that can affect a person's ability to achieve and maintain good health.
  - A healthy environment includes safe water and food supplies, suitably built and maintained housing and community facilities, as well as proper treatment and disposal of wastewater and solid waste.

- Every day as an EPHO is different! Some activities include:
  - health inspections of homes, public buildings and community events such as pow-wows
  - monitoring community drinking water supplies
  - providing public education
  - planning for and responding to emergencies
  - investigating disease outbreaks

- EPHOs get to make a difference in the communities they serve while travelling; spending time outdoors; working independently while also developing relationships with a wide variety of people, and applying their skills in many different settings

Day in the Life of an EPHO

[Environmental Public Health Officer Career Video: Margaret Coady]

Day in the Life of an EPHO

[Environmental Public Health Officer Career Video: Shannon Imhoff]

How to Become an EPHO?

- EPHOs must complete an accredited bachelor's degree program including a 12-week practicum and become a certified public health inspectors with the Canadian Institute of Public Health Inspectors (CIPHI)

- There are degree options available for students entering directly from high school (typically 4-years) and for those already possessing a Bachelor's Degree in Science (typically 1.5-2 years)

- To learn more about becoming certified please visit: https://ciphi.ca/certification/

- Indigenous Services Canada (ISC) offers practicum positions and all positions with ISC are paid

Financial Assistance for Schooling is Available!

- Indigenous Services Canada and the Environmental Health Foundation of Canada are offering a bursary for Indigenous students to attend any CIPHI-accredited program in Canada
  - The bursary covers ALL tuition and some living costs (approx. $15-20,000 per year) and will support recipients for the duration of their degree
  - For more information & to be notified when the bursary application cycle opens please visit : Bursaries Information | ehfc

- Additional funding opportunities for Indigenous students may be available through:
  - www.canada.ca/en/services/indigenous-peoples/education-training-jobs.html
  - www.indspire.ca
  - Your band council or community leadership

- Scholarships and bursaries for all students may also be available directly through the university or program
- Provincial student assistance programs, such as the Ontario Student Assistance Program (OSAP) are also available

Additional Resources

- To learn more about
  - what an EPHO working in a First Nation community does, please visit: Environmental Public Health Services in First Nations
  - How to become and EPHO : http://canada.ca/epho-isc
  - Environmental Public Health and being an EPHO generally, please visit: What is environmental health? – ciphi

- For specific questions related to EPHO careers at ISC please contact: ephocareer_carriereasep@sac-isc.gc.ca

- Indigenous Services Canada has also developed various resources to support building awareness of the career aimed at youth and adults, if you are an educator, community leader, work in social services, or similar and would be interested in receiving these resources please contact: ephocareer_carriereasep@sac-isc.gc.ca