National Radon Program

Health Canada

CARST 2016 Symposium-Montreal, April 24-27, 2016

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YOUR HEALTH AND SAFETY... OUR PRIORITY.
NATIONAL RADON PROGRAM

National Radon Lab

Education & Public Awareness

Radon Testing Projects

Database & Mapping

Radon Research

National Radon Program
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Technical Operations Highlights:

- **Federal Building Testing Program** – more than 20,000 buildings tested to-date - roughly 4% above the 200 Bq/m³ Canadian guideline
- **2010 National Building Code** for protection against radon ingress, and support for provincial and municipal building code changes
- **Residential surveys**: Cross Canada Radon and a smaller Radon-Thoron survey
- Development of **radon measurement and mitigation guidance documents**
- Data provision to support **radon potential mapping methodology, various research and policy changes**
- Development of **Canadian National Radon Proficiency Program (C-NRPP)** certification program for radon measurement and mitigation professionals
- Development of **National standards for radon in new and existing construction with Canadian General Standards Board (CGSB)**
Participants for both surveys were recruited by telephone using random digit dialing. Participants tested on the lowest occupied level of their home. Long-term alpha track detectors were utilized. 96% of participants conducted a test of at least 90 days duration, 0.1% tests less than 30 days duration. Raw arithmetic means comparable for the 2 surveys (97 and 96 Bq/m3 respectively). For the larger geographic-based 2-year survey, the raw arithmetic mean was stable from year 1 to year 2 at 97 Bq/m3. Open Data posting at some level this year.
Canadian National Radon Proficiency Program (C-NRPP)

- Certification program was put in place in 2011 and managed by the NRPP

- The Canadian C-NRPP program was launched in 2012 and was fully Canadianized in 2014—administered by Canadian Association of Radon Scientists and Technologists (CARST) with support from Health Canada

- QA Program Implemented

- Exam success rates and number of radon professionals continues to increase (331 Measurement/179 Mitigation)

- Working with Radiation Safety Institute to have a certified secondary radon chamber in Canada to support the C-NRPP program
Development of National Radon Mitigation Standards

• Agreement with the Canadian General Standards Board (CGSB) to develop two National Standards for Canada:
  • Radon Control Options for New Construction in Low Rise Residential Buildings - CAN/CGSB149.11
  • Radon Mitigation Options for Existing Low Rise Residential Buildings - CAN/CGSB149.12

Public Review stage for both drafts ended in the fall
Development of National Radon Mitigation Standards

- Comments were addressed and changes were made to existing construction (149.12) draft
- Redline draft for 149.12 should be ready for committee ballot shortly
- Most comments were addressed for the new construction draft (149.11)
- TC Chair waiting for several TC members to provide their input for the final items requiring TC input
- Once this is completed, a redline draft for 149.11 would be prepared for committee ballot as well
Research to Help Decide Which Way to Vent?

- Active Soil Depressurisation (ASD) Field study (REB 2013-0020) completed in fall 2015
- 52 homes with side-wall discharge/indoor fans in the Ottawa-Gatineau area
- Long-term indoor radon measurements (3-months) were performed during the heating season
- Average radon reduction ~ 90%
- Highest radon reduction ~ 99%
- Analysis of real-time continuous radon monitor (CRM) measurements near exhaust outlet to measure dissipation/dispersion
Research to Help Decide Which Way to Vent?
Arrays of continuous radon monitors (CRMs) were set up at 5 homes with highest pre-mitigation radon levels.

Generally 10-15 CRMs were setup at different distances and directions away from the ASD exhaust point.

Weather station was setup on site to record weather parameters including wind speed and direction.

One CRM was also setup to measure outdoor background radon levels far away from ASD outlet.

Outdoor CRM measurement duration was 6-8 hours.

Most instances radon reduces to BG levels in 1-2 m.

Possibility to follow-up with this cohort in future.
Research to Help Decide Which Way to Vent?

- A summary of the project was posted to the Health Canada Science Blog (subset of GC Science site) just before Christmas
- A public summary of the project has been written and we hope it is posted to the HC website soon
- Presented a poster at the Health Canada Science Forum in February
- Possibly a full scientific paper on the project as well

- Many thanks to Rob Mahoney, Marcel Brascoupè, and Bob Wood for participating in the project
Mitigation Actions Follow-up Study (REB-2014-0005)

Objectives:

- Acquire data on radon mitigation rates in Canadian homes that tested above the 200 Bq/m³ guideline in our 2 recent large residential surveys.

- Gather data on typical radon reductions achieved by various categories of mitigation strategies in Canadian housing stock/climates.

- Gather data on reasons why Canadians have or have not mitigated high radon levels.
Mitigation Actions Follow-up Study (REB-2014-0005)

Methodology:

• Recruitment: Participants from 2 large residential radon surveys who tested above the 200 Bq/m3 guideline

• Telephone survey of participants regarding what mitigation actions were taken and/or why mitigation actions were not taken

• Offer a free post-mitigation radon test to harvest statistics on the radon reductions achieved by various mitigation strategies

• Possibility of longer-term follow-up with this cohort
Mitigation Actions Follow-up Study (REB-2014-0005)

Study status:

- 64.5% of the valid sample participated in this telephone survey.
- Overall ~29% (327/1132) of survey participants indicated they had performed some form of mitigation.
- ~26% (294/1132) who performed some form of mitigation also agreed to participate in our free post-mitigation test.
- ~90% of test kits were returned.
- ~78% of these confirmed they tested on the same floor and were usable for statistical analysis of radon reductions.
Mitigation Actions Follow-up Study (REB-2014-0005)

Radon Reduction Trends:

Entry point sealing - not very effective ~ 11% average radon reduction

ASD - Mostly effective except for self-mitigated
Self-mitigated ~ 19% average radon reduction
Contractors ~ 81% average radon reductions
Certified Mitigators ~ 88% average radon reduction

Broad ventilation category ~25% average radon reduction
Study on Indoor Air Quality and Its Determinants in Housing (IAQDH study) (REB 2014-0014)

- Characterize & evaluate IAQ parameters in 3 areas: Montreal, Ottawa, & Chaudière-Appalaches (rural area south of Quebec city)
- Partnered with HC Water and Air Quality Bureau (WAQB) staff for this study
- Field study: Radon testing along with other IAQ tests (CO, NO₂, Formaldehyde, particulates, RH, ventilation) in 144 residences (n=48 per geographic area)
- 135 radon tests were completed (94% completion rate)
- Similar % of homes above the radon guideline in these 3 areas as found in the cross-Canada residential survey
- Data was reported to participants by the Principal Investigator in late fall
Assessment of Indoor Environmental Quality in Toronto Community Housing Buildings (REB 2014-0040)

- Determine impact of energy retrofit measures (windows, faucets, lighting, some heating, etc) in Toronto high-rise social housing on indoor environmental quality parameters (CO$_2$, ozone, formaldehyde, VOCs, heavy metals, temp, RH, radon)
- Partnered with University of Toronto Civil Engineering Dept./Toronto Atmospheric Fund (TAF)/Toronto Community Housing – multi-year project
- Occupant pre-retrofit questionnaire response data will also be used as guidance for some of the retrofit measures
- After the energy retrofits are completed the same indoor environmental quality parameter measurements will be repeated during the same time of year to study the effect of the retrofits on indoor environmental quality parameters
- Pre-retrofit measurement results currently being analyzed-radon results were low (98% <30 Bq/m$^3$), high =40 Bq/m$^3$
The project is now in the energy retrofit stage

Our REB certificate was renewed for another year in February

The retrofits will happen during 2016 and hopefully be completed in late 2016

Current schedule is to conduct the post-retrofit IAQ parameter testing, including radon, in early 2017
Revised Testing Guide For Public Buildings

• Both the Guide for Testing of Public Buildings and the Guide for Testing Homes were published in 2008 and hence both of these documents were due for an update.
• Much of the updating was centered around information that we gained from the testing of Federal buildings.
• There was also some updating to provide information regarding the need for QA/QC in testing programs.
• Also revisions to the guidance on testing devices with a particular re-emphasis on the need for long-term testing.
Revised Testing Guide For Public Buildings

• The Guide for Testing Public Buildings has now been published and resides here:

• The Guide for Testing of Homes is undergoing modifications currently and should be published in the near future
CHBA Videos

- Established a contract with CHBA for the production of several videos related to radon in new construction
- Worked with Jon Eakes who created the videos
- There are 5 videos in total ranging from terminology through to sealing, passive stacks, and active systems

http://www.joneakes.com/learning-curve/146-radon-in-english
http://www.joneakes.com/learning-curve/152-radon-en-francais
On-Demand ASD

- Assess energy savings potential of speed-controlled fans for Active Soil Depressurization systems
- Estimated an annual energy savings for two test sites:
  - **Site 1 (higher flow system):**
    - 57% electrical savings = 271 kWh
    - 66% reduced exhaust flow volume = 2307 kWh
  - **Site 2 (lower flow system):**
    - 29% electrical savings = 105 kWh
    - 59% reduced exhaust flow volume = 350 kWh
- Payback period would depend on the cost of the control loop system and whether running continuously at very low speed and then at higher speed as required has any impact on fan life
OTHER RADON RESEARCH - NRC

National Research Council (NRC)

- Passive stack geometries and insulation (CCHT)
- Research on radon entry into building envelope using the Radon Infiltration Building Envelope Test System (RIBETS)
- Gable-ended roof ASD discharge (IARL) to support CGSB standards
- Downdraft fans
- CCHT Renewal project - MURB
RADON RISK COMMUNICATION CHALLENGE

- Nobody knows about it – unfamiliar (not so much anymore😊)
- You can’t see it, smell it or taste it
- There’s no bad guy – it’s naturally occurring
- The health risk is long term – not immediate
- It targets everyone – no at-risk population (like kids)
- Need for long term testing – everyone wants an immediate answers
- The risks that kill people and the risks that concern people are often completely different!
RADON E&A PROGRAM IN A NUTSHELL

• **2008-2010 – PROGRAM DEVELOPMENT** - focus was on developing materials, increasing availability of testing resources, engaging stakeholders and establishing public outreach programs

• **2011-2013 – DEPTH & BREADTH / REVIEW and ADVANCEMENT** - strengthened partnerships, refined risk messaging, developed targeted outreach programs and establishing RAM

• **2014-2016 – WATERSHED PROGRESS** – CBC special report in June 2014, Mike Holmes PSA, growth of RAM, significant increase in provincial/territorial/municipal and community engagement and action

AMAZING PROGRESS THANKS TO THE INCREDIBLE STAKEHOLDER INVOLVEMENT AND ACTION!!

• **2016 and Beyond** – Continue building on progress and what is working – Provinces, municipalities, industry and NGOs start taking the lead
RADON OUTREACH

National
- Promotion and Distribution of radon outreach materials
- NOVEMBER is Radon Action Month
- Canada Post’s SmartMoves program to 650,000 + homeowners
- Pro-active radon engagement with P&Ts
- Events and conferences: home shows, health care, real estate and home builders

Targeted
- Physicians Online - Radon: Another Reason to Quit
- MacHealth – Radon accredited continuing medical education course
- Pro-active engagement with at risk regions and communities
- 3 Point Home Safety Checklist campaign – targeting families and childcare sector
- Canadian Real Estate Association - co-branded radon publication
Health Canada continues to see an increase in the number of public inquiries, outreach activities, demand for radon materials and visits to the radon web pages.

In June of 2015 The House of Commons Standing Committee undertook a study of the main causes of lung cancer beyond smoking, including radon gas.

- Health Canada along with CPCHE, CELA, CAREX and BCCDC were all asked to appear as witnesses as a part of this study.
- Demonstrates the recognition of radon as a serious contributor to lung cancer in Canada thanks to all of the work that is done by all of the Radon Stakeholders!

Successful 3rd Radon Action Month – advancement and improvements

- Establishment of Provincial Leads
- Communication with stakeholder committee early and more regularly
- National advertising and promotion
- Great stakeholder engagement
2015-16 Regional Highlights

BC
• Building code amended - passive stack for new constructions in radon rich areas
• Radon mitigation manuals in over 60 public libraries
• 5th Annual Radon Workshop
• RadonAware provincial program

ON
• Municipalities that have made or are considering changes to their building codes – Guelph, Thunder Bay, Windsor, St. Thomas and Elgin
• Radon article in the Journal of the Ontario Building Officials Association
• National Radon Webcast by the Canadian Cancer Society during RAM – Reached ~80 lung cancer survivors and their families

AB and the North
• Yukon Govt took action in November to increase radon awareness & radon testing
• Media story in the Calgary Herald had tremendous impact on radon awareness, public inquiries and requests for radon test kits
• Collaborations progressing with industry and NGO stakeholders

MB & SK
• Community Open Houses: 10 locations very positive response, media attention and increased test kit sales
• Take Action on Radon Saskatchewan Coalition: collaborative efforts & work planning
• Red River College Applied RADON Research: Engineering tech and Environmental students and Research Chair
2015-16 Regional Highlights

QC
• Travail de proximité avec des homologues provinciaux dans 5 directions de santé publique - Capitale NTL, Bas-Saint-Laurent, Outaouais, Estrie, Montérégie)
• 2ème année de sensibilisation du nord du Nouveau Brunswick – Cinq présentations et démonstrations
• 9 activités médias

ATL
• HC, NS Govt, NS Lung, and Acadia delivered first public Radon Workshop in Atlantic Canada.
• Partnered with Halifax Regional Municipality, Bathurst and NS Lung for 2 radon education and testing projects. An estimated 700 homes were tested.
• Northern NB Francophone Outreach: a series of 4 municipal mayor meetings, 6 radon cloud chambers demonstrations and 4 radon education lectures. Results - 2 municipal radon surveys were conducted in 2015 in that region.

CHALLENGES
• Lack of provincial and territorial government engagement and radon committee / working group that includes both govt, NGO and industry
• ON and QC building codes – lack of radon protection
• Policy Change: Increased awareness has not lead to sustainable policy decisions to support radon risk reduction
• Cost / lack of financial support - There are important segments of the population (low income, young professionals and families) who are not taking action simply due to cost.
**RADON CME - CONTINUING MEDICAL EDUCATION COURSE**

- **Focus on Promotion** - reaching out to professional associations and stakeholders across the country and asking them for their help in disseminating the course

- **Digital Marketing and Social Media** - Banner ads through CMAJ, the Cdn Healthcare Network and the Cdn Journal of Respiratory Therapists. Facebook, LinkedIn and Google Ad words

- Promotion has had a positive impact on raising awareness, course registration and completions
  - Promotional campaign led to an 813% increase in web visits and a 134% increase in registrations and 500% increase in completions – compared to the previous year

- MacHealth currently host over 25 courses. In 2015 Radon ranked #8 for the number of registrants and #2 for the number of course completions
Physicians Online is a physician driven program making samples and information material available to physicians on a demand basis.

April 2015- March 2016: Radon – Another reason to quit factsheet distribution:

- 13% increase in factsheet distribution from the previous fiscal year.
- 60% increase in factsheet distribution during the month of November (RAM)
- 44% of the radon factsheets were ordered by Physician’s in the province of Ontario.
- 88% of the radon factsheets were requested by the General/Family practice specialty.
Scout Environmental – Radon Awareness and Energy Efficiency Program Pilot

As buildings are sealed for energy conservation there is a potential risk in increasing radon levels ....

PURPOSE:

• Raise awareness and promote testing within the New Brunswick Power Home Insulation Energy Savings program
  • In person discussions, distribution of radon and energy efficiency information and follow-up telephone survey.

• Explore collaboration opportunities between energy efficiency programs and radon reduction promotion
  • Evaluate effectiveness of combining radon education and testing into EE programs
  • Determine potential for integrating radon-related measures into existing utility-based rebate programs across Canada
Radon Awareness & Energy Efficiency Efficiency Pilot Program

SUCCESES & CHALLENGES

**CHALLENGE**
Utility’s concern with negative link between EE measures and high radon levels

**SOLUTION**
Promotional material with positive messaging that emphasizes utility’s intention to help customers balance energy efficiency upgrades with indoor air quality

**PROGRAM SUCCESS**
168 Conversations with NB homeowners about radon in home
145 Long-term radon test kit set-ups
2015-16 NEW OUTREACH PROJECTS

CP CHE / Pollution Probe
*Increasing radon awareness and action through workplace engagement*

- Radon testing pilot competition to challenge employers at 30 GTA workplaces to test for radon and to encourage employees to test their homes.

- Develop a radon action program for the new Healthy Communities national campaign, led by Pollution Probe, sponsored and championed by Great-West Life.

- Initially faced widespread concerns from workplaces about liability when testing.
  - Developed options for workplace testing to overcome barriers – ex. engaging OHS committees.
EXPECTATIONS EXCEEDED

- 45 participants, 150% original target
- Expanded due to national interest
- Reached seven provinces and 27 communities across Canada.
Thank You