



Radon in Schools Screening: Final Report

Prepared by: Health Protection
Vancouver Coastal Health
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Executive Summary

Introduction

- Radon is a naturally occurring, colourless and odourless radioactive gas that is produced by the decay of uranium found in rock, soil or water. Radon gas enters buildings through cracks in the foundation, walls or floors and gaps around cables or pipes. Indoors, radon can accumulate to concentrations much higher than the outdoor air. Long-term exposures to radon have been linked to an increased risk of lung cancer.
- In a previous survey of radon concentrations in homes conducted by Health Canada, homes within the Vancouver Coastal Health (VCH) boundaries had low radon concentrations in comparison to the rest of the province. However, some homes in the North Shore/Coast Garibaldi regions of VCH had concentrations above the Canadian guideline (about 3%) and World Health Organization (WHO) recommended action level (about 10%).

Methods

- Public schools in the North Shore/Coast Garibaldi regions of VCH (North Vancouver, West Vancouver, Sea-to-Sky, Sunshine Coast, Powell River and Central Coast) were screened for radon during the 2017/2018 school year.
- Approximately 1850 alpha track detectors were deployed in 92 schools for a minimum of 91 days during the winter months.

Results, Conclusions and Next Steps

- This school screening initiative found that 10% of schools had at least one room above the WHO recommended action level of 100Bq/m³ and 3% had at least one room above the Canadian guideline of 200Bq/m³. The percentage of schools with radon concentrations above the Canadian and/or WHO guideline is similar to that found in homes in the region in the Health Canada Cross Canada Survey of Radon Concentrations in Homes.
- School buildings with radon concentrations at or above the Canadian or WHO guideline levels are currently undergoing follow-up testing to determine if levels are elevated during the day when the building is occupied. If radon concentrations are above guideline levels during the hours that the building is occupied mitigation measures will be recommended to reduce exposures.
- Given that 10% of schools had at least one screening detector above the WHO recommended action level, and the health effects of radon are from long-term exposures, it is important for homeowners in the North Shore/Coast Garibaldi region of VCH to test their homes for radon and mitigate when necessary.

Introduction

Radon is a naturally occurring, colourless and odourless radioactive gas produced by the decay of uranium found in rock, soil or water. Radon gas enters buildings through cracks in the foundation, walls or floors and gaps around cables or pipes. Indoors, radon can accumulate to concentrations much higher than the outdoor air. Radon levels are often highest in basements or lower levels of buildings as they are closer to the source of radon. Long-term exposures to radon have been linked to an increased risk of lung cancer. Radon can be found in any building including homes, workplaces and schools.

The risk of health impacts due to radon exposure is greatest from exposures in buildings where people spend the majority of their time, and exposure over many years. Given that people spend the majority of their time in their homes, Health Canada recommends that everyone test their homes for radon.

The Canadian guideline for remedial action is 200Bq/m³. Ideally, we want radon levels to be as low as practical. Some jurisdictions, including the World Health Organization (WHO), recommend taking action if concentrations are above 100Bq/m³.¹

In a previous survey of radon concentrations in homes conducted by Health Canada, homes within Vancouver Coastal Health (VCH) boundaries were found to have low concentrations in comparison to the rest of the province. However, some homes in the North Shore/Coast Garibaldi regions of VCH had concentrations above the WHO recommended action level (8%) and the Canadian guideline (about 3%) (Table 1). This percentage is still much lower than many other areas of BC or Canada. For comparison, 8% of BC homes tested above the Canadian guideline and 29% of homes in the Kootenay-Boundary area tested above this guideline (Health Canada, 2012).

Table 1. Data from the Cross-Canada Survey of Radon Concentrations in Homes for Vancouver Coastal Health, 2009-2011. (Data provided by Health Canada)

Health Service Delivery Area	Number of participants	% below 100 Bq/m ³	% at or above 100 Bq/m ³	% at or above 200 Bq/m ³
Vancouver	104	99%	0%	1%
Richmond	63	100%	0%	0%
North Shore/Coast Garibaldi	96	92%	8%	3%

The objective of this initiative was to screen public schools for radon in the North Shore/Coast Garibaldi region of VCH (North Vancouver, West Vancouver, Sea-to-Sky, Sunshine Coast, Powell River and Central Coast). Schools within VCH have not previously been tested for radon and school environments have the potential to expose a large number of people over a significant period of time. This school screening initiative was undertaken to confirm that radon concentrations are low in schools and to encourage people to confirm levels are low in their own homes. The hope is that school facility testing programs could encourage parents, teachers and community members to test their homes for radon.

¹ Bq/m³ is a measure of the number of radioactive disintegrations per second in a cubic meter of air.

Methods

Testing methods recommended in the Health Canada Guide for Radon Measurement in Public Buildings were followed for this screening initiative (Health Canada, 2016). Alpha track detectors were placed in all occupied classrooms in contact with the ground or directly above unoccupied areas of the basement, where students spend more than 4 hours per day. Occupied upper floor rooms built into the side of a hill were also tested. For rooms larger than 200m², one detector was placed for every 200m². Detectors were also placed in occupied school portables. Blanks and duplicates were deployed for quality control purposes. The detectors remained in the classrooms for at least 91 days before being sent to the lab for analysis.

The alpha track detectors were deployed and retrieved by VCH Environmental Health Officers. A training presentation was given before deployment to ensure consistent methods were used. In addition, senior environmental health officers coordinated the deployment and were available to answer questions or address concerns as they came up.

Detectors were located in the classrooms where they were not likely to be disturbed by students for the duration of the measurement period. Ideally, detectors were placed at breathing height and in an area with normal air flow, but this was not always possible. Stickers reading “Please Do Not Disturb, Radon Measurement Device” with contact information were placed by each detector. Datasheets provided by the lab were used to document the detector location.

Before the alpha track detectors were rolled out, a letter with an FAQ document was sent to parents and staff to provide information on radon and explain the screening initiative. As part of this communication, information was provided to parents on how to test their homes, including information on a Citizen Science project at Simon Fraser University that provides low cost or free detection kits in exchange for providing their results to the SFU researchers. Examples of the communication materials can be found in Appendix B.

Once the results were received from the lab and analyzed, they were communicated with the school district. A plan was developed to conduct follow-up testing where elevated results were detected. Letters explaining the screening results and next steps were sent to parents and staff including a table summarizing the results for each school. This communication again encouraged parents and guardians to test their own homes for radon, explaining that a large portion of time is spent in the home environment.

Results

Approximately 1850 alpha track detectors were deployed in 92 schools. Fifteen-percent of the detectors deployed were either a blank or a duplicate. Upon pickup, 6% of the detectors were missing across all of the schools. The percentage of detectors missing within each school ranged from 0% to 33%.

The majority of the school districts had one or two schools with at least one room above the WHO recommended action level of 100 Bq/m³. Three school districts had a school with at least one room above the Canadian guideline of 200 Bq/m³. A summary of the results from this screening initiative is presented in Table 1. Individual school results for each of the school districts can be found in Appendix A.

Table 2. Summary of radon screening results by school district

School District	Number of schools tested	Number of schools with at least one room at or above 100 Bq/m ³	Number of schools with at least one room at or above 200 Bq/m ³
Central Coast	4	1	0
North Vancouver	32	1	0
Powell River	8	1	1
Sea to Sky	14	2	1
Sunshine Coast	15	1	0
West Vancouver	17	2	1
Other	2	1	0
Total	92	9 (10%)	3 (3%)

Conclusions and Next Steps

The percentage of schools with radon concentrations above the Canadian and/or WHO guidelines is similar to that found in homes in the region in the Cross Canada Survey of Radon Concentrations in Homes. This school screening found that 10% of schools had at least one room above the WHO recommended action level and 3% had at least one room above the Canadian guideline. For the Cross Canada Survey of Radon Concentrations in Homes, 8% of homes in this region tested above the WHO recommended action level with 3% above the Canadian guideline (Health Canada, 2012).

This screening provided an average of radon concentrations over the 3 month testing period; however radon concentrations are variable over time and can be impacted by the heating, ventilation and air-conditioning (HVAC) systems of large buildings such as schools. For this reason, school districts with buildings with at least one detector at or above the WHO recommended action level have been undergoing follow-up testing to determine if levels are elevated during the day when the building is occupied. This involves setting up continuous radon monitors to understand the daily variation in radon concentrations. Many of the schools have initiated follow-up testing using certified radon testing professional and are finding that radon concentrations are higher during the evenings and weekends when the HVAC systems are off and decrease during the day when the HVAC system is on.

If concentrations are above guideline levels when the building is occupied, there are a number of extremely effective approaches to mitigating buildings with elevated radon concentrations. Mitigation efforts may include: modifications to the HVAC system, such as increasing ventilation or modifying the times the system is on; or installing a venting system to direct the radon gas from underneath the building to the outside air where it is quickly diluted to low levels and is no longer a health concern.

Given that 10% of schools had at least one screening detector above the WHO recommended action level, and the health effects of radon are from long-term exposure, it is important for homeowners within the North Shore/Coast Garibaldi region of VCH to test their homes for radon and mitigate when necessary. For new buildings, effective design and construction approaches are available to minimized indoor radon exposure.

References

Health Canada. 2012. Cross-Canada Survey of Radon Concentrations in Homes: Final Report. Ottawa, ON. Available at: https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/radiation/radon/survey-sondage-eng.pdf

Health Canada. 2016. Guide for Radon Measurements in Public Buildings. Ottawa, ON. Available at: https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/radiation/radon_building-edifices/27-15-1468-RadonMeasurements_PublicBuildings-EN13.pdf

Appendix A: Individual School Results

Table 3. Radon school screening results for the Central Coast School District.

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100 Bq/m ³	# (%) of results above or equal to 100 Bq/m ³ but below 200 Bq/m ³	# (%) of results above or equal to 200 Bq/m ³ but below 600 Bq/m ³	# (%) of results above or equal to 600 Bq/m ³
Bella Coola Elementary School	9	9 (100%)	0 (0%)	0 (0%)	0 (0%)
Nusatsum Education School	8	8 (100%)	0 (0%)	0 (0%)	0 (0%)
Shearwater Elementary School	1	0	1*	0	0
Sir Alexander MacKenzie Secondary School	10	10 (100%)	0 (0%)	0 (0%)	0 (0%)
Wuikinuwx Elementary School	To be tested in the following year				

*result was at 100 Bq/m³

Table 4. Radon school screening results for the North Vancouver School District.

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100 Bq/m ³	# (%) of results above or equal to 100 Bq/m ³ but below 200 Bq/m ³	# (%) of results above or equal to 200 Bq/m ³ but below 600 Bq/m ³	# (%) of results above or equal to 600 Bq/m ³
Argyle Secondary School	35	35 (100%)	0 (0%)	0 (0%)	0 (0%)
Blueridge Elementary School	19	19 (100%)	0 (0%)	0 (0%)	0 (0%)
Boundary Elementary School	16	16 (100%)	0 (0%)	0 (0%)	0 (0%)
Braemar Elementary	14	14 (100%)	0 (0%)	0 (0%)	0 (0%)
Brooksbank Elementary	25	25 (100%)	0 (0%)	0 (0%)	0 (0%)
Canyon Heights School	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Capilano Elementary	12	9 (75%)	3 (25%)	0 (0%)	0 (0%)
Carisbrooke Elementary School	15	15 (100%)	0 (0%)	0 (0%)	0 (0%)
Carson Graham Secondary	23	23 (100%)	0 (0%)	0 (0%)	0 (0%)
Cleveland Elementary School	16	16 (100%)	0 (0%)	0 (0%)	0 (0%)
Cove Cliff Elementary School	19	19 (100%)	0 (0%)	0 (0%)	0 (0%)
Dorothy Lynas Elementary School	34	34 (100%)	0 (0%)	0 (0%)	0 (0%)
Eastview Elementary	21	21 (100%)	0 (0%)	0 (0%)	0 (0%)
Handsworth Secondary School	31	31 (100%)	0 (0%)	0 (0%)	0 (0%)
Highlands Elementary School	18	18 (100%)	0 (0%)	0 (0%)	0 (0%)

Table 4 cont'd. Radon school screening results for the North Vancouver School District.

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100 Bq/m ³	# (%) of results above or equal to 100 Bq/m ³ but below 200 Bq/m ³	# (%) of results above or equal to 200 Bq/m ³ but below 600 Bq/m ³	# (%) of results above or equal to 600 Bq/m ³
Larson Elementary	18	18 (100%)	0 (0%)	0 (0%)	0 (0%)
Lynn Valley Elementary	14	14 (100%)	0 (0%)	0 (0%)	0 (0%)
Lynnmour Elementary School	20	20 (100%)	0 (0%)	0 (0%)	0 (0%)
Montroyal Elementary	11	11 (100%)	0 (0%)	0 (0%)	0 (0%)
Mountainside Learning Centre	13	13 (100%)	0 (0%)	0 (0%)	0 (0%)
Norgate Elementary	15	15 (100%)	0 (0%)	0 (0%)	0 (0%)
Queen Mary Elementary	5	5 (100%)	0 (0%)	0 (0%)	0 (0%)
Queensbury Elementary	13	13 (100%)	0 (0%)	0 (0%)	0 (0%)
Ridgeway School	17	17 (100%)	0 (0%)	0 (0%)	0 (0%)
Ross Road Elementary	23	23 (100%)	0 (0%)	0 (0%)	0 (0%)
Seycove School	32	32 (100%)	0 (0%)	0 (0%)	0 (0%)
Seymour Heights Elementary School	19	19 (100%)	0 (0%)	0 (0%)	0 (0%)
Sherwood Park Elementary School	16	16 (100%)	0 (0%)	0 (0%)	0 (0%)
Sutherland School	22	22 (100%)	0 (0%)	0 (0%)	0 (0%)
Upper Lynn Elementary	13	13 (100%)	0 (0%)	0 (0%)	0 (0%)
Westview School	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Windsor Secondary	23	23 (100%)	0 (0%)	0 (0%)	0 (0%)

Table 5. Radon school screening results for the Powell River School District.

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100Bq/m ³	# (%) of results above or equal to 100Bq/m ³ but below 200Bq/m ³	# (%) of results above or equal to 200Bq/m ³ but below 600Bq/m ³	# (%) of results above or equal to 600Bq/m ³
Brooks Secondary School	27	27 (100%)	0 (0%)	0 (0%)	0 (0%)
Edgehill Elementary	15	15 (100%)	0 (0%)	0 (0%)	0 (0%)
Henderson Elementary	5	5 (100%)	0 (0%)	0 (0%)	0 (0%)
James Thomson Elementary	10	10 (100%)	0 (0%)	0 (0%)	0 (0%)
Kelly Creek Elementary	9	9 (100%)	0 (0%)	0 (0%)	0 (0%)
Ocean View Learning Center	16	16 (100%)	0 (0%)	0 (0%)	0 (0%)
Texada Elementary	6	0 (0%)	4 (67%)	2 (33%)	0 (0%)
Westview Elementary School	8	8 (100%)	0 (0%)	0 (0%)	0 (0%)

Table 6. Radon school screening results for the Sea-to-Sky School District.

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100Bq/m ³	# (%) of results above or equal to 100Bq/m ³ but below 200Bq/m ³	# (%) of results above or equal to 200Bq/m ³ but below 600Bq/m ³	# (%) of results above or equal to 600Bq/m ³
Blackwater Creek Elementary	2	2 (100%)	0 (0%)	0 (0%)	0 (0%)
Brackendale Elementary	24	24 (100%)	0 (0%)	0 (0%)	0 (0%)
Don Ross Middle School	11	11 (100%)	0 (0%)	0 (0%)	0 (0%)
Garibaldi Highlands Elementary	28	28 (100%)	0 (0%)	0 (0%)	0 (0%)
Howe Sound Secondary	27	27 (100%)	0 (0%)	0 (0%)	0 (0%)
Mamquam Elementary	18	18 (100%)	0 (0%)	0 (0%)	0 (0%)
Myrtle Philip Elementary	23	23 (100%)	0 (0%)	0 (0%)	0 (0%)
Pemberton Secondary	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Signal Hill Elementary	29	29 (100%)	0 (0%)	0 (0%)	0 (0%)
Spring Creek Elementary School	11	5 (45%)	6 (55%)	0 (0%)	0 (0%)
Squamish Elementary	15	15 (100%)	0 (0%)	0 (0%)	0 (0%)
Stawamus Elementary	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Valleycliffe Elementary	16	4 (25%)	9 (56%)	3 (19%)	0 (0%)
Whistler Secondary School	20	20 (100%)	0 (0%)	0 (0%)	0 (0%)

Table 7. Radon school screening results for the Sunshine Coast School District.

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100 Bq/m ³	# (%) of results above or equal to 100 Bq/m ³ but below 200 Bq/m ³	# (%) of results above or equal to 200 Bq/m ³ but below 600 Bq/m ³	# (%) of results above or equal to 600 Bq/m ³
Cedar Grove Elementary	16	16 (100%)	0 (0%)	0 (0%)	0 (0%)
Chatelech Secondary School	40	40 (100%)	0 (0%)	0 (0%)	0 (0%)
Davis Bay Elementary	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Elphinstone Secondary	27	27 (100%)	0 (0%)	0 (0%)	0 (0%)
Gibsons Elementary	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Halfmoon Bay Elementary	15	15 (100%)	0 (0%)	0 (0%)	0 (0%)
Heritage Learning Centre	3	3 (100%)	0 (0%)	0 (0%)	0 (0%)
Kinnikinnick Elementary School	24	24 (100%)	0 (0%)	0 (0%)	0 (0%)
Langdale Elementary	9	9 (100%)	0 (0%)	0 (0%)	0 (0%)
Madeira Park Elementary	11	11 (100%)	0 (0%)	0 (0%)	0 (0%)
Pender Harbour Secondary School	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Phoenix School Building	2	1 (50%)	1 (50%)	0 (0%)	0 (0%)
Roberts Creek Elementary	17	17 (100%)	0 (0%)	0 (0%)	0 (0%)
Sechelt Elementary	13	13 (100%)	0 (0%)	0 (0%)	0 (0%)
West Sechelt Elementary	15	15 (100%)	0 (0%)	0 (0%)	0 (0%)

Table 8. Radon school screening results for the West Vancouver School District.

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100Bq/m ³	# (%) of results above or equal to 100Bq/m ³ but below 200Bq/m ³	# (%) of results above or equal to 200Bq/m ³ but below 600Bq/m ³	# (%) of results above or equal to 600Bq/m ³
Bowen Island Community School	19	19 (100%)	0 (0%)	0 (0%)	0 (0%)
Caulfield Elementary School	8	8 (100%)	0 (0%)	0 (0%)	0 (0%)
Cedardale Elementary	13	11 (85%)	2 (15%)	0 (0%)	0 (0%)
Chartwell Elementary	15	15 (100%)	0 (0%)	0 (0%)	0 (0%)
Cypress Park Primary School	7	5 (71%)	1 (14%)	1 (14%)	0 (0%)
Eagle Harbour Primary	7	7 (100%)	0 (0%)	0 (0%)	0 (0%)
Gleneagles Elementary School	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Hollyburn Elementary School	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Irwin Park Elementary	13	13 (100%)	0 (0%)	0 (0%)	0 (0%)
Lions Bay Community School	5	5 (100%)	0 (0%)	0 (0%)	0 (0%)
Pauline Johnson Elementary School	12	12 (100%)	0 (0%)	0 (0%)	0 (0%)
Ridgeview Elementary School	14	14 (100%)	0 (0%)	0 (0%)	0 (0%)
Rockridge Secondary	14	14 (100%)	0 (0%)	0 (0%)	0 (0%)
Sentinel Secondary School	29	29 (100%)	0 (0%)	0 (0%)	0 (0%)
West Bay Elementary	17	17 (100%)	0 (0%)	0 (0%)	0 (0%)
West Vancouver Secondary School	59	59 (100%)	0 (0%)	0 (0%)	0 (0%)
Westcot Elementary	8	8 (100%)	0 (0%)	0 (0%)	0 (0%)

Table 9. Radon school screening results for other public schools within the geographic boundaries of the North Shore/Coast Garibaldi Health Service Delivery Area

School	# of test devices (excluding blanks, duplicates and missing)	# (%) of results below 100Bq/m ³	# (%) of results above or equal to 100Bq/m ³ but below 200Bq/m ³	# (%) of results above or equal to 200Bq/m ³ but below 600Bq/m ³	# (%) of results above or equal to 600Bq/m ³
Anahim Lake Elementary and Junior Secondary School	8	8 (100%)	0 (0%)	0 (0%)	0 (0%)
Island Discovery	5	3 (60%)	2 (40%)	0 (0%)	0 (0%)

Appendix B: Sample Communication Materials

Sample Testing Notification Letter



December 15, 2017

Dear Parents and Guardians,

North Vancouver Schools will be working in partnership with Vancouver Coastal Health to screen for radon in all district schools this winter. Radon is a naturally occurring, colourless and odourless radioactive gas that is produced by the decay of uranium found in rock, soil or water. Although we have no evidence that radon is a problem in any of our schools, we want to be sure that levels are below recommended guidelines. This is part of our ongoing commitment to the health and safety of students and staff.

The testing will take approximately four months starting in January 2018 and will have no impact on school activities. We will inform you of the results once the screening program is completed, likely toward the end of the school year. If radon levels are found to be elevated, affected buildings will be remediated.

Radon can be found in any building so Vancouver Coastal Health encourages you to also test your home this winter. As we are generally in our homes 60-75% of the time, it is important to ensure that radon concentrations at home are below recommended guideline levels. The risk of health impacts is greatest following exposure over many years.

Please refer to the fact sheet attached for more information on this screening initiative and how you can test for radon at home. If you have questions or concerns contact -----, Senior Environmental Health Officer at Vancouver Coastal Health at -----, or -----, Communications Manager for the North Vancouver School District at -----.

Sincerely,

Dr. Mark Lysyshyn
Medical Health Officer
Vancouver Coastal Health

Mr. Mark Pearmain
Superintendent of Schools
North Vancouver School District

Sample FAQ Document



Radon Screening in Schools Fact Sheet

What is radon?

Radon is a naturally occurring, colourless and odourless radioactive gas that is produced by the decay of uranium found in rock, soil or water. Radon gas enters buildings through cracks in the foundation, walls or floors and gaps around cables or pipes. Indoors, radon can accumulate to concentrations much higher than the outdoor air. Long-term exposures to radon have been linked to an increased risk of lung cancer. Radon can be found in any building including homes, workplaces and schools. Given that we spend the majority of our time at home and the health effects of radon are from long term exposures, Health Canada recommends that everyone test their home for radon. Testing is easy and effective mitigation measures exist.

What schools are being tested and why?

Radon concentrations across Vancouver Coastal Health have typically been low in comparison to the rest of the province. This school screening initiative is being undertaken to confirm this in schools and to encourage people to confirm levels are low in their own homes.

Public schools in North Vancouver, West Vancouver, Sea-to-Sky, Sunshine Coast, Powell River and Central Coast will be tested for radon. In a previous survey of radon concentrations in homes conducted by Health Canada, the homes within the Vancouver Coastal Health boundaries had low concentrations in comparison to the rest of the province. However, slightly more homes in the Coastal regions of Vancouver Coastal Health had concentrations above the Canadian guideline (about 3%). This percentage is still much lower than many other areas of BC or Canada; for comparison 8% of British Columbia homes tested above the Canadian guideline and 29% of homes in the Kootenay-Boundary area tested above this guideline.

Table 1. Data from the Cross-Canada Survey of Radon Concentrations in Homes for Vancouver Coastal Health, 2009-2011. Canadian guideline: 200Bq/m³. World Health Organization recommended guideline: 100Bq/m³. (Data provided by Health Canada)

Health Service Delivery Area	Number of participants	% Below 100 Bq/m ³	% Between 100 and 200 Bq/m ³	% Above 200 Bq/m ³
Vancouver	104	99%	0%	1%
Richmond	63	100%	0%	0%
North Shore/Coast Garibaldi	96	92%	5%	3%

Where will the detectors be placed in the schools?

Radon levels are often highest in basements or lower levels of buildings as they are closer to the source of radon; therefore, this testing will be conducted in classrooms that are in contact with the ground or directly above unoccupied areas of the basement.

How long will the testing take?

The detectors must remain in the classrooms for at least 91 days and are then sent off to the lab for analysis.

When will we get the results?

If all goes smoothly with the detector rollout, we expect to receive test results in May or June.

Will the detectors pose a risk to students or disrupt classroom activities?

No. The testing will be done using Alpha Track detectors that are about the size of a hockey puck. These detectors operate on the principle of diffusion and do not require a pump or other form of electricity. (see image)



What are the radon guidelines?

Canadian guideline for remedial action is 200Bq/m³.

As our knowledge of the health effects from radon increases, so does our understanding of the risk of exposure to lower concentrations. Ideally, we want radon levels to be as low as practical. Some jurisdictions, including the World Health Organization, recommend taking action if concentrations are above 100Bq/m³.

What happens if the radon levels are high?

Once the screening is completed, buildings with radon concentrations above the guideline levels will undergo necessary further testing to determine when and where levels are elevated. If mitigation is required, there are a number of extremely effective approaches to mitigating buildings with elevated radon concentrations. Mitigation for radon often involves installing a venting system that will direct the radon gas from underneath the building to the outside air where it is quickly diluted to low levels and is no longer a health concern. Other mitigation efforts may include modifications to the heating, ventilation and air-conditioning system, such as increasing ventilation or modifying the times that the system is on.

When should action be taken?

Because we are concerned about long-term radon exposures, the goal is to remediate the building within a year or two of receiving the test results. Health Canada recommends taking remedial action within two years if concentrations are between 200Bq/m³ and 600Bq/m³ and within one year if concentrations are above 600Bq/m³. If concentrations are between 100Bq/m³ and 200Bq/m³ remedial action can be taken within two years of receiving the test results. If radon concentrations are found to be elevated in district schools, priority would first be given to schools with higher concentrations.

How do I test my own home for radon?

Vancouver Coastal Health recommends performing a long-term radon test for at least 91 days in the lowest level of your home that is occupied for more than four hours a day. Testing should be conducted in the winter months when windows in the home are closed.

A limited number of low-cost radon detection kits are available from a Citizen Science project underway at Simon Fraser University, to people who would like to test their homes for radon. Information on this project can be found at www.sfu.ca/radon. For any enquiries about this Citizen Science project, please contact sfucitizenscience@gmail.com. Otherwise, radon detection kits can be purchased online or at some hardware stores for \$30-50. When purchasing a detector, ensure that it is for a long-term test and that the cost of the lab analysis is included in the detector price.

Resources

- Health Canada: <https://www.canada.ca/en/health-canada/services/environmental-workplace-health/reports-publications/radiation/radon-reduction-guide-canadians-health-canada-2013.html>
- BC Lung Association: <http://www.radonaware.ca/>
- Take Action on Radon Public Resources: <https://www.takeactiononradon.ca/public-resources>
- SFU lead Citizen Science Project: www.sfu.ca/radon
- Canadian National Radon Proficiency Program: <http://c-nrpp.ca/>
- Cross-Canada Survey of Radon Concentrations in Homes: https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/radiation/radon/survey-sondage-eng.pdf

Sample Results Letter



September 18, 2018

Dear Staff, Students and Parents/Guardians:

Subject: Radon testing results

From January to April of this year, the North Vancouver School District worked in partnership with Vancouver Coastal Health to screen for radon in all of our schools. We are pleased to advise our school district community that test results in all schools were below the Canadian guideline for radon levels. Radon is a naturally occurring, colourless and odourless radioactive gas that is produced by the decay of uranium found in rock, soil or water. Radon can gather in buildings and long-term exposure can have health consequences. While there was no evidence that radon might be a problem in the North Vancouver School District, we proactively tested all schools as part of our ongoing commitment to the health and safety of students and staff.

Screening is now complete and the test results can be found below. The results for all schools are below the Canadian guideline of 200 Bq/m³. In one school, screening identified concentrations in some classrooms above the World Health Organization suggested action level of 100 Bq/m³. While the levels are still well below the Canadian guideline, additional detailed testing will now be conducted in that one school to assess variations in radon concentrations over the days, nights and weekends. It is possible that radon concentrations are below 100 Bq/m³ in these classrooms during the daytime when the school is in use because the ventilation system is running at these times. The school district will be engaging certified professionals to conduct this additional testing over the next few months, and the results will be shared with parents as soon as they are available. The continued use of these classrooms while further testing is being planned is not a health concern.

Vancouver Coastal Health continues to encourage families to test their homes for radon because children and adults spend most of their time at home. A child's classroom exposure represents a small portion of their overall potential radon exposure. Over a calendar year, children spend approximately 15 per cent of their time in their schools, and 60-75 per cent of their time in their homes. Testing should be done during the winter. Please refer to [this fact sheet](#) for more information on this screening initiative and how you can test your home for radon.

If you have questions or concerns, please contact -----, Senior Environmental Health Officer at Vancouver Coastal Health at -----, or -----, Communications Manager for the North Vancouver School District at-----.

Sincerely,

Dr. Mark Lysyshyn
Medical Health Officer
Vancouver Coastal Health

Mr. Mark Pearmain
Superintendent of Schools
North Vancouver School District