

INDUSTRIAL HYGIENE REPORT

RADON TESTING REPORT

Candalaria Elementary School

Report to: Vonnie B. Good, EHS Salem-Keizer Public Schools

By: Kathy Ellis, Senior Industrial Hygiene Consultant

Reviewed By: DeEtta Burrows, MSPH, CIH – Wise Steps, Inc.

On-site: November 9 –12, 2021

Report: November 27, 2021

PURPOSE

After initial testing in showed radon levels above EPA's Action Level of 4.0 picoCuries/L (pCi/L) in a number of rooms at Candalaria Elementary School, three radon mitigation systems were installed in August of 2010. To ensure that the systems are functioning properly and levels are well below EPA's Action Level, annual radon testing is performed.

CONCLUSION AND RECOMMENDATION

All classrooms had low to non-detectable levels of radon. Only one test location was at or above the EPA's action level of 4 picoCuries per liter (pCi/l) this location is: "Dungeon" or storage room @ 14.6 pCi/L. The room had a radon level @ 3.3 pCi/L which is above the Salem-Keizer Public Schools target level of 2.7 pCi/L where retesting should be done.

Neither the "dungeon" nor the fan room are occupied.

TESTING

Radon testing was conducted using protocols recommended by the Oregon Health Authority per OAR 332.341-345. Radon Air-Chek short-term test devices were used in the rooms by suspending the device in each room. The testing occurred from November 9-12, 2021 during normal and routine school ventilation system operation, as well as with the radon mitigation system in operation. Weather conditions during the weeks prior of testing had been generally wet with cold to moderate temperatures.

This testing was conducted under COVID-19 recommended precautions of having increased outside air supplied to the building.

Quality assurance testing was also conducted by utilizing blank (QCB) test devices, and duplicate samples per the recommendations found in OAR 332.341-345.

EPA RADON GUIDELINES

The EPA has set an Action Level of 4.0 pCi/L (picoCuries per liter) for schools. If classrooms or buildings have radon levels at or above 4.0 pCi/L, EPA recommends that schools take action to reduce the level. These actions include:

Step 1. If your result is 4.0 pCi/L or higher, take a follow-up test (Step 2) to be sure.

Step 2. Follow up with either a long-term test or a second short-term test.

The World Health Organization has set their action level at 2.7 pCi/L. Salem-Keizer Public Schools has determined that 2.7 pCi/L is a target level where retesting should be done.

CONTROL OF RADON LEVELS IN SCHOOLS

The major control mechanism for lowering radon levels within school buildings is the use of dilution ventilation. If the amount of outside air delivered into a building increases, the radon levels should decrease.

Sample Data Attached

Radon test result report for:**CANDALARIA
MAIN**

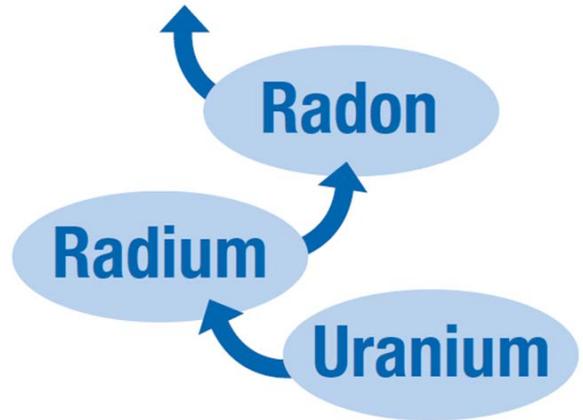
Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9601900	CUSTODIAN	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	3.3 ± 1.0	2021-11-22
9601901	DUNGEON	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	14.6 ± 1.7	2021-11-22
9601914	GYM E	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601913	GYM W	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601915	PE OFFICE	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601921	QCB 1	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601903	RM 1 S	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601902	RM 1 W	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	1.3 ± 0.9	2021-11-22
9601904	RM 2	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	1.3 ± 0.9	2021-11-22
9601896	RM 20 OFFICE MANAGER	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601905	RM 3	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601906	RM 4	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601907	RM 5 E	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601908	RM 5 W	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601911	RM 6 A	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	2.2 ± 1.0	2021-11-22
9601909	RM 6 E	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	2.1 ± 0.9	2021-11-22
9601910	RM 6 W	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	1.5 ± 0.9	2021-11-22
9601899	SCHOOL OFFICE	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	< 0.3	2021-11-22
9601898	SPEECH	2021-11-09 @ 10:00 am	2021-11-12 @ 10:00 am	2.4 ± 1.0	2021-11-22

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498

Note: QCB1 is a blank sample and part of the quality control process for radon testing.

Radon in schools

Fact Sheet on Radon Exposure for Students and Staff



What is radon?

Radon is a radioactive gas you can't see, smell or taste. It is a decay product of uranium and is found all over the world. Uranium and its decay products are naturally found in the soil and rocks beneath buildings. Our school image (right) shows how uranium naturally decays into radium that further breaks down into radon gas. Radon moves up through the soil and enters buildings in contact.

Why is radon a problem in Oregon schools?

Radon is the 2nd leading cause of lung cancer, after smoking. The Environmental Protection Agency (EPA) estimates around 21,000 radon-related lung cancer deaths occur each year. Breathing high levels of radon in combination with smoking is even more dangerous and increases your risk by ten times.

Home is likely the most significant source for breathing radon. According to the EPA, 1 out of 15 homes has high radon levels. School is likely the second largest source of radon exposure for students and staff. The only way to know your radon levels is to test. The EPA recommends that **all** homes and schools be tested for radon.

EPA
ACTION
LEVEL

4.0 **Picocuries**
Liter of air

Testing at Home

Radon testing at home can be simple and inexpensive. You can find do-it-yourself test kits at most local hardware stores and online from the [American Lung Association](http://www.AmericanLungAssociation.org). Oregon Health Authority (OHA) Radon Program also offers FREE test kits to those living in areas where little data is available. To find out if you are eligible, contact radon.program@state.or.us.

Testing in Oregon Schools

By law (ORS 332.166-167), all Oregon schools are required to test for radon before January 1, 2021.

School radon testing involves the placement of small testing devices in all frequently occupied rooms on the lowest level of the building. Initial testing is short-term and lasts between 2 and 7 days. Test devices are not dangerous in any way.

Rooms that test at or above 4.0 picocuries per liter of air (pCi/L) (EPA recommended action level) are subject to longer confirmation testing and radon reduction systems.

*Test results for your school can be found at:

For more information about radon, visit www.healthoregon.org/radon.

If you have other questions or concerns about radon testing at your school, contact _____ at _____.

