Per **ORS 332.166-167**, Oregon School Districts shall develop a plan for testing schools under their jurisdiction for elevated levels of radon and submit it to the Oregon Health Authority on or before September 1, 2016. **ORS 332.166-167** specifies that *“at a minimum any frequently-occupied room in contact with the ground or located above a basement or crawlspace should be tested.”* Examples of such rooms include: offices, classrooms, computer rooms, conference rooms, gyms, auditoriums, cafeterias, and break rooms. This does not mean storage rooms, bathrooms, stairways, hallways, kitchens, or elevator shafts. A minimum of one detector for every 2000 sq. ft. of open floor space or portion thereof is required. **ORS 332.166-167** *requires initial testing of elevated levels of radon on or before January 1, 2021.*

Radon is a naturally occurring colorless, odorless, tasteless and radioactive gas. It travels through the soil and enters buildings through cracks and opening in the foundations. Eventually, radon decays into radioactive particles (decay products) that can be trapped in the lungs when you breathe. Prolonged exposure can cause an increased risk of lung cancer. Radon is found throughout Oregon and in a variety of structures. *The only way to know if a building has elevated radon levels is to test.*

The EPA recommends reducing the concentration of radon in indoor environments to below the **Radon Action Level** of **4.0 pCi/L.** Radon is measured and reported in **picocuries per liters of air (pCi/L**). A Curie is the amount of radioactivity released from one gram of radium. The goal is radon reduction, not elimination, as it’s not possible to reduce people’s risk of radon exposure to zero.

Using Oregon Health Authority (OHA) and Environmental Protection Agency (EPA) guidelines [see Appendices], Molalla River School District has created a radon testing plan for the following buildings:

Molalla High School 357 Francis St

Molalla River Middle School 318 Leroy Ave

Molalla Elementary School 910 Toliver Rd

Clarkes Elementary School 19100 S. Windy City Rd

Mulino Elementary School 26660 S. Highway 213

Rural Dell Elementary School 10500 S. Highway 211

Natural Resources Center 14994 S. Vaughn Rd

Molalla River School District

Administration Office and Shops 412 Sweigle Ave

Molalla River School District will begin initial radon testing with a “*short term passive*” device, which is a radon test device that does not require external power to make it work. The testing will take place over a period of 2 to 7 days in “*closed-building conditions*.” All areas in a building will be tested simultaneously when the HVAC system is operating as it does normally, usually during the months of October through March.

* If the results of the initial Short term test are **less than 2.0 pCi/L**, ORS 332.166-167 requires school districts to test again every 10 years.
* If the result is **between 2.0 and 4.0 pCi/L**, the District will work on lowering the radon level in that room or area.
* If the result is **between 4.0 and 8.0 pCi/L**, the District will conduct a follow-up measurement of that room using a *Long-Term test*. This will be conducted over as much of a nine-month school year as possible, when the rooms or areas are likely to be occupied. If that follow-up result is equal to or greater than 4.0 pCi/L, then radon mitigation will be performed.

EPA and OHA recommend that follow-up testing of rooms or areas that have results between 4.0 pCi/L and 8.0 pCi/L should be conducted before any mitigation decisions are made, ideally within one month of receiving initial testing results. The follow-up testing in a room or area should be conducted in the same locations under the same conditions as the initial testing.

OHA recommends that a School District utilize the tools found in the *Step-by-Step Guide for Planning Radon Testing in Oregon Schools.* [see Appendices].

The results of these tests will be provided to the District School Board, the Oregon Health Authority, and be made readily available to parents, guardian, students, staff, school volunteers, administrators, and community representatives at the school’s office, the District office, and on the District website.

APPENDIX A ORS 332.166-167

APPENDIX B: FAQ about Radon and Schools

APPENDIX C: Websites

APPENDIX D: Step-by-Step Guide for Planning Radon Testing

APPENDIX E: *Testing for Elevated Radon in Oregon Schools* from OHA

**APPENDIX A**

**ORS 332.166** Provision of information to school districts about elevated levels of radon. (1) The *Oregon Health Authority* shall disseminate information related to elevated levels of radon to each school district in this state. Information disseminated under this section must include:

 (a) Information about radon and the dangers associated with elevated levels of radon;

 (b) The level of radon at which the United States Environmental Protection Agency recommends schools take action to reduce indoor radon concentrations;

 (c) Processes by which schools may be tested for elevated levels of radon; and

 (d) Model plans developed pursuant to **ORS 332.167**.

(2) Dissemination of information under subsection (1)(c) of this section must take into account industry standards for testing buildings for elevated levels of radon.

 (3) Upon request, the *State Board of Education* shall assist the authority in disseminating the information described in this section. Dissemination of information may occur by any reasonable means, including posting the information on a website maintained by the authority or the Department of Education and providing each school district with instructions on how to access the information*. [2015 c.729 §1]*

Note: **332.166** and **332.167** were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 332 or any series therein by legislative action. See *Preface to Oregon Revised Statutes* for further explanation.

**ORS 332.167** Tests of schools for elevated levels of radon; plan; results.

(1) A school district shall develop a plan for testing schools for elevated levels of radon. At a minimum, plans developed under this subsection must:

 (a) Provide for the testing of radon in any frequently occupied room in contact with the ground or located above a basement or a crawlspace; and

 (b) Provide for the testing of radon in a school at least once every 10 years.

 (2) The *Oregon Health Authority* shall develop model plans for school districts to follow in implementing the requirements of this section. The authority shall seek the input of the *Oregon School Boards Association* in developing the model plans.

 (3) Results of a test performed under this section must be:

 (a) Provided to the District School Board;

 (b) Provided to the authority in a manner prescribed by the authority; and

 (c) Made readily available to parents, guardians, students, school employees, school volunteers, administrators and community representatives at the School’s office or School District’s Office or on a website for the School or School District.

 (4) Information provided and made available under subsection (3) of this section must include the level of radon at which the *United States Environmental Protection Agency* recommends schools take action to reduce indoor radon concentrations. *[2015 c.729 §2]*

Note: **Section 3, chapter 729, Oregon Laws 2015,** provides: Sec. 3.

(1) A school district shall submit the plan developed under section 2 of this 2015 Act **[332.167]** to the *Oregon Health Authority* **on or before September 1, 2016.**

 (2) Notwithstanding section 2 (1)(b) of this 2015 Act, plans developed under section 2 of this 2015 Act shall require **initial testing of schools for elevated levels of radon on or before January 1, 2021.**

 (3) Subsection (2) of this section does not apply to any school that has been tested for elevated levels of radon on or after **January 1, 2006***. [2015 c.729 §3]*

Note: See note under **332.166**.

**APPENDIX B**

**FREQUENTLY ASKED QUESTIONS ABOUT RADON AND SCHOOLS**

1. Does radon cause headaches, eye irritation, or sick-building syndrome? *No.*

2. Do children have a greater risk of cancer from radon exposure?

*Children usually are more sensitive to environmental pollutants; however, there is no conclusive data right now that shows that children are more at risk than adults from radon exposure.*

1. Is there a hazard from touching/being near the radon test kit?

*No, although kits should be kept away from very young children (toddlers) so they don’t eat or chew on them.*

4. Do building materials emit radon? *The primary source of radon in a building or home is from the soil underneath it. However, there may be a few building materials that will emit small amounts of radon gas, such as granite, concrete, gypsum board (sheet rock), bricks, and field stone. However, this is RARELY the case because most of these materials are very dense. This means that if there is radon-producing radium in these materials, only a small amount of the radon gas near the surface ever makes it out into the environment.*

1. Should testing be delayed if the school is planning major renovations to the building or the HVAC system?

*Initial and follow up tests should be conducted prior to major HVAC or installed as a part of renovation. Testing must also be done after renovation.*

6. Should upper floors of a school or building be tested? Does this mean that upper floors never have elevated levels*? Upper floors may indeed have elevated levels of radon. However, measurements in ground floor rooms are likely to be a good indicator of radon levels for all floors.*

7. In schools with a basement level (below ground level), the first floor is often built at ground level, and therefore is in contact with the soil, only along its outside edge. Should this floor be tested?

*Although this floor appears to have limited contact with the soil, the outside rooms may have openings permitting radon entry and should be tested if they are frequently occupied. ORS 332.166-167 requires that all frequently occupied rooms in contact with the soil or above a basement or crawlspace be tested.*

8. Nearby homes and schools have reported no elevated levels of radon. Should we still test? *Yes, radon levels vary with geology, building structure, HVAC systems, etc. The only way to know if radon is present is to test. ORS 332.166-167 states school buildings shall be tested every 10 years, current national guidelines (ANSI/AARST, 2014) recommend that school buildings be re-tested every five years (or whenever there is significant renovation or change to a building’s the HVAC system).*

 9. What are the costs of testing in schools for radon?

*The cost may be dependent upon the number of rooms to be tested and the type of test kit used, but on average, radon testing of schools in Oregon costs about $10 per tested room. This assumes short-term test kits are purchased in bulk and that school staff perform the testing.*

 10. If a room’s short term initial test result is very high (for example

 Above 100 pCi/L) should a follow-up measurement be taken?

*Yes, follow up measurements, even if the initial ones are high, are recommended before making any further decisions.*

 11. Should a room be retested if there evidence of tampering? *Yes.*

12. How do you place radon test kits in large, open spaces such as cafeterias, gymnasiums, or auditoriums? *Test kits may be hung from the ceiling and or wall using string and masking/duct tape. Be sure to hang them per the “Test Kit Placement Guide.”*

13. How do we test partitioned classrooms? *Classrooms with movable* *partitions should be individually tested.*

14. Can you test during unusual weather conditions (heavy rain, snow or wind)? *Avoid testing during these conditions.*

15. Should we take quality assurance duplicates and blanks during the follow up tests? *Yes, per the “Interpretation of Results” section above. However, there are generally fewer samples taken for follow-up testing.*

16. When two devices (duplicates) are placed in a room during initial testing, which measurement result is taken as the test result?

*Both tests are recorded, but the average is taken as the test result.*

17. What should be done if a device is picked up late or handled incorrectly? *All test kits should be handled in accordance with manufacturer’s instructions. If there is any discrepancy or problem, the serial number of the device should be recorded and noted to the laboratory doing the analysis. The actual time device was picked up and a brief description of how the device was mishandled should be included in log.*

**APPENDIX C**

**WEBSITES**

School staff, parents, and students may be interested in additional information on radon. The Oregon Radon Awareness Program suggests the following radon websites:

1. **Environmental Protection Agency (EPA)** *[www.epa.gov/radon]* EPA’s main page on everything radon.

2. **EPA’s Radon in Schools** page *[www.epa.gov/radon/radon-schools]*

3. **National Radon Program Services** *[www.sosradon.org]* This EPA-funded program is nationally-recognized leader in radon education.

4. **National Cancer Institute’s Radon page** *[www.1.usa.gov/1qGOOtM]*

5. **Oregon Field Guide: Radon** *[http://bit.ly/1SLRgWC]*

This 12-minute episode, from Oregon Public Broadcasting, provides an excellent introduction on why elevated radon is a concern in Oregon.

6. **Oregon Health Authority’s Frequently Asked Questions on Radon** *[www.healthoregon.org/radon]* In addition to FAQ’s, OHA’s main radon page has information on radon risk in Oregon and how homes can easily be tested.

**APPENDIX D**

STEP-BY STEP GUIDE FOR PLANNING RADON TESTING

By going through well-thought out “dry-run” on paper, staff (e.g. School Radon Measurement Teams) will likely be able to identify timelines, costs (staff time & test kit costs) and unforeseen barriers. Knowing these, before testing begins, may result in more accurate test results and decreased costs.

**1. Identify rooms to be tested**

**ORS 332.166-167** specifies that “*at a minimum, any frequently-occupied room in contact with the ground or located above a basement or a crawlspace*” should be tested.

Examples of such rooms include: offices, classrooms, computer rooms, conference rooms, gyms, auditoriums, cafeterias & break rooms. This does not mean storage rooms, bathrooms, stairways, hallways, kitchens or elevator shafts.

Staff should procure a copy of the school’s emergency escape map can be used as the floor plan, since it usually provides the most accurate and up-to-date information. The map can be used to identify the “frequently-occupied rooms” at a particular school site. As discussed below, that map can also be used to indicate which test kit types will go in which room.

Make sure all rooms in the building floor plan are individually labeled; if they are not then create labels for them.

1. Determine the number of test kits needed.
2. Count all frequently-occupied rooms, as defined in ORS 332.166-167. At the end of section 2a) you should have a rough list of rooms that need to be tested.

\_\_\_\_\_\_\_\_\_\_\_\_\_*Number of rooms*

1. Determine if any of the rooms selected are larger than 2,000 square feet.

*If YES, how many?* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Determine the number of test (detectors) kits needed to test the entire school site:

 \_\_\_\_\_\_\_\_\_\_(total number of rooms after section 2a).

 \_\_\_\_\_\_\_\_\_\_(number of rooms over 2,000 square feet).

 \_\_\_\_\_\_\_\_\_\_(number of rooms over 4,000 square feet).

 \_\_\_\_\_\_\_\_\_\_(number of rooms over 6,000 square feet).

***TOTAL***\_\_\_\_\_\_\_\_\_ ***Number of Detector Kits Needed to Test the School Site***

**3. Determine the Number of Quality Control Measurements Needed**

1. Determine the number of duplicate measurements that need to be deployed during measurement.

Rooms to be tested x 0.10 (10%) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[NOTE: Round up to the next whole number. Remember, a minimum of one duplicate kit per building.]

1. Determine the number of blank measurements that need to be deployed during measurement.

Rooms to be tested x 0.05 (5%) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[NOTE: Round up to the next whole number. Remember, a minimum of one blank kit per building.)

1. Determine the number of spike measurements that need to be deployed during measurement.

Rooms to be tested x 0.03 (3%) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

[NOTE: Round up to the next whole number.]

1. **Determine total number of test kits needed to perform all required tasks.**

\_\_\_\_\_= Number of detector kits determined in Section 2

\_\_\_\_\_= Number of duplicate tests determined in Section 3a.

\_\_\_\_\_= Number of blank tests determined in Section 3b.

\_\_\_\_\_= Number of spike tests determined in Section 3c.

 **TOTAL**\_\_\_\_\_= **Number of Test Kits Needed to Test the School Site**

1. **Use a Test Kit Location Floor Plan to create Test Kit Placement Log(s)**

To determine School Radon Measurement Teams can use a template of the school’s emergency escape plan to decide which rooms the different types of test kits (detectors, blanks & duplicates) will be placed. These documents will guide the planning of a radon testing effort as well as the actual testing itself.

The School Floor Plan is used is used to create Test Kit Placement Log(s) for the school which indicates where the detectors, duplicates, and blanks are to be placed when initial testing of the school for elevated radon begins.

IMPORTANT: Because each building on a school site should have a minimum of one detector, one duplicate and one blank, a separate Test Kit Placement Log should be created for each building on the school site.

**APPENDIX E**

See attached.