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Radon Testing and Reporting Plan

David Douglas School District
Portland, Oregon

Prepared for:

David Douglas School District
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August 2016 – Updated January 2018
23179.043 Phase 0001

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For

DAVID DOUGLAS SCHOOL DISTRICT

Prepared by

PBS Engineering and Environmental Inc.
4412 SW Corbett Avenue
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Introduction:

In 2015, the Oregon Legislature passed Oregon Revised Statute (ORS) 332.166-167 which, in part, requires school districts to develop a plan for testing district-owned buildings for radon, test for radon, and report test results to parents, school boards, district staff, and the Oregon Health Authority (OHA). This Radon Testing and Reporting Plan is designed to meet statute requirements for developing a radon testing plan for submittal to OHA by the deadline of September 1, 2016.

David Douglas School District is committed to providing a safe environment for students and staff. As radon is the number one cause of cancer deaths in the United States among non-smokers, and schools are the second most commonly occupied buildings for children, testing for radon in schools is a priority for David Douglas School District.

This Radon Testing and Reporting Plan meets the guidelines outlined in OHA's *Testing for Elevated Radon in Oregon Schools: A Protocol and Plan Version 1.0 – 2016.* The plan will be initiated after September 1, 2016, with initial testing completed before the OHA deadline of January 1, 2021.

Any questions about this document or results of radon testing should be directed to David Callaway, Operations Manager for David Douglas School District, at (503) 261-8232.

David Callaway, Operations Manager

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1. PLAN SUMMARY

1.1 Background

David Douglas School District (District) is located in Portland, Oregon and is comprised of 15 separate school campuses. Along with administrative, maintenance, transportation, and special program sites, the district maintains approximately 33 buildings that are regularly occupied by students or staff. David Douglas School District is committed to completing initial radon testing, in accordance with ORS 332.166-167, in district-owned schools and sites prior to January 1, 2021. It is estimated that approximately 1,045 rooms will need to be tested for radon, based on the guidance outlined in the OHA *Testing for Elevated Radon in Oregon Schools: A Protocol and Plan Version 1.0 – 2016 (Plan).*

1.2 Regulatory Requirements

In 2015, the Oregon Legislature passed House Bill (HB) 2931 to bring awareness to elevated radon levels in Oregon schools. HB 2931 later became Oregon Revised Statute (ORS) 332.166-167.

This Radon Testing and Reporting Plan is designed to help school districts fulfill the requirements of (ORS) 332.166-167 of submitting a plan to the Oregon Health Authority (OHA) by September 1, 2016.

Per ORS 332.166-167, actual testing of each school for radon will be completed before January 1, 2021, and testing results will be sent to OHA and posted on the school's or school district's website.

1.3 About Radon

Radon is a naturally occurring colorless, odorless, tasteless, and radioactive gas. Radon comes from natural deposits of uranium in the soil and is found everywhere in the world. Uranium naturally decays into radium, which further breaks down into radon gas. Because radon is a gas, it can move up through the soil and enter buildings that are in contact with the soil. Radon is typically at its highest concentration in the lower portion of a building. Once radon enters a building, it is easily dispersed through the air. It then begins a radioactive decay process that leads to the creation of radon decay products. If inhaled, these radioactive particles (decay products) can be trapped in the lungs. As these particles decay further, they release small bursts of radiation, which can damage lung tissue and lead to lung cancer over the course of a lifetime.

According to EPA estimates, radon is the number one cause of lung cancer among non-smokers. No amount of radon is safe, but steps can be taken to reduce its potential for harm.

For most schoolchildren and school staff, the second largest contributor to radon exposure, next to their home is their school. As a result, both USEPA and the Oregon Health Authority (OHA) recommend that school buildings and homes be tested for radon. For schools in Oregon, this recommendation became law in the 2015 Legislature (ORS 332.166-167).

1.4 Action Level

In the US, radioactivity is measured in Curies. A Curie is the amount of radioactivity released from one gram of radium. A picocurie is a millionth of a millionth, or a trillionth, of a Curie. Radon is measured and reported in picocuries per liters of air (pCi/L).

USEPA recommends reducing the concentration of radon in indoor environments to below the Radon Action Level of 4.0 pCi/L; however, this "action level" is not health-based, since any amount of radon is considered harmful.

2. TESTING PLAN

2.1 Testing Locations

The District will develop a detailed list of rooms for each site to be tested for radon in accordance with recommendations in the OHA Plan. The District will utilize each facility's floor plan to determine testing locations in frequently occupied rooms that are in contact with the ground or located above a crawlspace or basement, as required per ORS 332.166-167. Locations to be tested will be identified on drawings to be included in final reports and future radon testing plans.

Once testing locations are identified for each site, the District will calculate the number of test kits needed for each site. One test kit or device will be used per room for rooms that are less than 2,000 square feet in size. For rooms greater than 2,000 square feet, one kit or detector will be placed for every 2,000 square feet.

For quality assurance purposes, the District will also calculate the number of kits or devices needed to allow for blanks, duplicates, and spikes. Blanks will be deployed in five percent of the rooms to be tested at each site. Duplicates will be deployed in ten percent of rooms to be tested at each site. Blanks and duplicates will be deployed following the same methodology as the actual test kits. Spike samples are used for laboratory quality control and are not deployed on site. Test kits from the same batch as the kits used for on-site testing are sent to a third-party laboratory and "spiked" with a known concentration of radon. These test kits are then returned to the user and submitted to the testing laboratory along with the test kits from each school. Spikes will be submitted at a rate of three percent of the rooms to be tested at each site. Delivery of spike samples will coincide with the collection of test kits, duplicates, and blanks. A minimum of one blank, one duplicate, and one spike will be deployed per site.

For specific details and guidance, see sections "What rooms should be tested?" "Quality Assurance Procedures for a School Radon Measurement Program," and "APPENDIX D: STEP-BY-STEP GUIDE FOR PLANNING RADON TESTING" in the attached OHA Plan.

Initial Short-Term Testing:

All locations identified will be tested using short-term activated charcoal adsorption test kits. Test kit, duplicate, and blank locations will be plotted on a building floor plan and tracked in a placement log or electronic database. Ideally, initial short-term testing will occur in October to allow time for follow-up long term testing beginning in November, if needed. If possible, testing will occur during normal school days or days when the HVAC system is functioning in the same manner as normal school days.

Specific details and guidance outlining best practices for placing test kits and when to deploy test kits is not included in the scope of this plan. See "APPENDIX A: RADON TEST PLACEMENT PROTOCOL CHECKLIST" in the attached OHA Plan for details and guidance.

Results of the initial short-term tests that are ≥4.0 pCi/L will be evaluated using the quality assurance calculations listed in the "INTERPRETATION OF RESULTS" section of the attached OHA Plan.

The David Douglas School District will schedule a second short-term test, or long-term follow-up test based on the initial short-term test results as indicated below:

- If the result is less than 2.0 pCi/L, the District will test again every 10 years (as required by Oregon Revised Statute 332.166-167).
- If the result is between 2.0 pCi/L and 4.0 pCi/L, the District will test every 10 years. The District may investigate options for fixing (lowering) the radon in that room (e.g., adjustments to HVAC, sealing entry routes, etc.).
- If the result is between 4.0 pCi/L to 8.0 pCi/L, the District will perform 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 rooms are likely to be occupied. If that result is equal to or greater than 4.0 pCi/L, the District will investigate options for lowering the radon in that room (e.g., adjustments to HVAC, soil depressurization, sealing entry routes, building pressurization, zone-specific ventilation, etc.).
- If the initial test result is equal to or greater than 8.0 pCi/L, the District will conduct a second short-term test within one month. The follow up result is then averaged with the result of the initial short-term test (see follow-up testing below).
- If the average result of the two short-term tests is equal to or greater than 4.0 pCi/L, the District will investigate options for lowering the radon in that room (e.g., adjustments to HVAC, soil depressurization, sealing entry routes, building pressurization, zone-specific ventilation, etc.).

- If the follow-up test is long-term, and the result is 4.0 pCi/L or above, the District will investigate options for lowering the radon in that room (e.g., adjustments to HVAC, soil depressurization, sealing entry routes, building pressurization, zone-specific ventilation etc.).

Results of any follow-up tests that are ≥4.0 pCi/L will be evaluated using the same quality assurance calculations as the initial short-term tests listed in the "INTERPRETATION OF RESULTS" section of the attached OHA "Testing for Elevated Radon in Oregon Schools: A Protocol and Plan."

CRM Use

The District may use continuous radon monitors (CRM) for follow-up long term and short term testing. The use of CRMs can help determine radon levels in a room during times it is actually occupied, which may in turn determine if adjustments to the HVAC system are adequate for reducing radon levels.

Mitigation

Mitigation measures are not specifically addressed in this plan but the District is committed to doing everything it can to reduce radon levels and provide a safe environment in every district building.

The EPA, OHA Oregon Radon Awareness Program, and numerous non-governmental groups, recommend that school districts take action to reduce the radon level in those rooms where the average of the initial and follow-up short-term kit results OR the result of the long-term kit used in follow-up is 4.0 pCi/L or more.

Although not required of school districts under ORS 332.166-167, it is recommended that school administration direct appropriate staff members to adjust building HVAC systems and retest. If this doesn't reduce the radon below 4.0 pCi/L, school districts have the option of hiring a radon mitigation professional to reduce elevated radon levels identified through testing.

Periodic Retesting

Following initial short-term radon testing, District sites will be retested every 10 years as required by ORS 332.166-167. Additional testing may be undertaken by the District, in addition to the 10 year retest cycle, should any of the conditions noted in the "When Should Periodic Retesting be Done?" section of the attached OHA Plan apply.

2.2 Reporting

All radon testing results will be made available to the District's school board, the Oregon Health Authority, and readily available to parents, guardians, students, school employees, school volunteers, administrators, and community representatives at the school office, district office, or on a website for the school or school district as required by ORS 332.166-167. Follow-up testing results, 10-year retest results, and mitigation implementation will also be made available.