

Sherwood Charter School

2016 Radon Test Results

SHERWOOD CHARTER SCHOOL

SAFETY COMMITTEE

Principal – Joy Raboli

Parent Volunteers – Amy Verkest, Shari Scholz, and Renée Simas

Sherwood Charter School

2016 Radon Test Results

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.

In accordance with ORS § 332.167, which requires that school districts (including charter schools) develop a plan to test for elevated levels of radon in schools and submit to the Oregon Health Authority (OHA) by September 1, 2016, and complete initial testing for elevated levels of radon by January 1, 2021, the Sherwood Charter School (SCS) Board of Directors, in cooperation with the SCS Safety Committee, took these important steps to ensure that SCS buildings do not contain elevated levels of radon:

1. On September 1, 2016, SCS submitted its *Radon Testing and Reporting Plan* to OHA.
2. The SCS Board of Directors directed the Safety Committee to proceed with initial testing for radon at its September 29, 2016, meeting in accordance with the *SCS Radon Testing and Reporting Plan* (available on SCS website).
3. On October 4, 2016, the Safety Committee reviewed the recommended step-by-step guide for planning for radon testing at SCS. (See Appendix A: “Step-by-Step Guide for Planning Radon Testing in Oregon Schools” in OHA’s *Testing for Elevated Radon in Oregon Schools*.)

SCS is comprised of a single school campus leasing space and land from Sherwood Community Friends Church, located at 23264 SW Main Street, in Sherwood, Oregon. School classrooms, offices, and support services are located in the main building shared with the church; four additional modular buildings (portables) are located on site for a total of five (5) buildings that are occupied by students and staff. All five buildings were included in the testing plan.

The Safety Committee utilized facility floor plans to plot testing locations and initially tracked these locations in a placement log and subsequently transferred them to an electronic spreadsheet. (See Appendices B and C.) These floor plans were included in SCS’s *Radon Testing and Reporting Plan* to OHA. For the safety of our students, however, these floor plans will not be publicly posted on the SCS website; they will, instead, be made available for parents, faculty and staff in the school office.

The committee identified 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. The following 17 rooms were identified for

testing: 11 classrooms (K, 1, 2, 3, 4, 5, math, art, science, humanities) and 6 offices/work spaces (Principal, main school office, copy room, reading specialist/work room, counselor's office, and staff room/back office). Detector kits required: 17.

The number of quality control measurements needed were then determined. Three types of quality assurance measures were conducted to ensure reliable readings:

Duplicates: Team determined the number of duplicate measurements that need to be deployed during measurement. Rooms to be tested $\times 0.10$ (10%) = 1.7 or a minimum of **one duplicate kit per building is required**. Duplicate kits required: 5.

Blanks: Team determined the number of blank measurements that need to be deployed during measurement. Rooms to be tested $\times 0.05\%$ (5%) = .85 (1). **A minimum of one duplicate kit per building is required**. Duplicate kits required: 5.

Spikes: Team determined the number of spike measurements that need to be deployed during measurement. Rooms to be tested $\times 0.03\%$ (3%) = .51 – round up to the next whole number (1). Spike kits required: 1. However, SCS conducted 2 additional spike measurements for additional quality assurance. Spike kits tested: 3.

4. Upon receipt of the radon detector kits from Air Chek, Inc., on October 13, 2016, five (5) detector kits were opened and immediately closed. On the placement logs, these kits are identified as “blanks:” 7136415, 7136416, 7136417, 7136418, and 7136419.
5. Per Air Chek's recommendation, Safety Committee then contacted Bowser-Morner, a spiking company, to determine the spiking schedule and their fees. Air Chek's calibration is performed using the Bowser-Morner Radon Reference Laboratory; therefore, Air Chek recommends only Bowser-Morner spiking services are used to ensure that there is no conflict of interest.
6. Bowser-Morner exposed/spiked three (3) of the charcoal devices with radon for 2-3 days for quality assurance. The fee for this service was \$270. The charge for shipping and handling was \$38.94. The total prepayment of \$308.94 was submitted in advance as required.
7. The three (3) detector kits that were spiked with known concentrations of radon are identified on the placement logs as: 7136404, 7136420, and 7136421. (See Appendix D: “Exposure in Bowser-Morner Radon Chamber” for supporting documentation.)
8. Spike kits were received by SCS on October 24, 2016, and coincided with placement of remaining detector kits.
9. Initial short-term testing using activated charcoal adsorption test kits was performed over 70-72 hours beginning October 25, 2016. Placement of test kits followed the protocol outlined in *Testing for Elevated Radon in Oregon Schools*, an OHA publication. Parents

and staff were notified by office staff via email on October 25 that testing had begun and notes were hung with devices to ensure devices were not disturbed. Per OHA recommendations and the SCS *Radon Testing and Reporting Plan*, the testing occurred in October to allow time for follow-up, long-term testing beginning in November, if needed. Testing occurred during normal school days when the HVAC system was functioning as usual.

10. Detector kits, blanks, duplicates, and spikes were retrieved and sent via UPS on 10/28/16 and received by Air Chek, Inc. on November 1, 2016.
11. All analysis was completed on November 1, 2016.
12. The results were communicated to Sherwood Charter School principal and Safety Committee on November 3, 2016. Air Chek's test results are included in this report as Appendix E.
13. The results were reviewed and discussed by the SCS Safety Committee on November 8, 2016, prior to submission to SCS Board of Directors.

ACTION LEVEL and RESULTS

In the US, radioactivity is measured in curies. A curie is approximately the amount of radioactivity produced by one gram of radium. A picocurie is one trillionth of a curie. Radiation from radon is expressed in picocuries per liters of air (pCi/L). US EPA has set the action level for radon at 4.0 pCi/L and recommends reducing the concentration of radon in indoor environments to below this action level.

The Safety Committee is pleased to report that all detector kits indicate levels of radon well below the action level for radon in schools. All readings in the main building of SCS fall in the range of 1.0 to 1.5 pCi/L (± 0.3). All readings in the portables range between <0.3 to 0.5. The lab was unable to provide analysis for detector kit# 7136422 due to missing information on the start date. However, because eleven (11) other radon detection devices were deployed in the portables (including two (2) detection kits in an adjoining classroom) and all of those results consistently detected similar, extremely low levels of radon, the Safety Committee feels confident in current test results and does not recommend retesting the fourth grade classroom.

A full discussion of the steps that SCS will take for elevated radon levels is available in the SCS *Radon Testing and Reporting Plan*; however, that discussion is unnecessary here. **No further testing needs to be performed at this time, and no mitigation efforts are necessary.**

Because the results are less than 2.0 pCi/L, SCS will test again every 10 years (as required by ORS §332.166-167); the next radon test will be conducted in October 2026.

COMMUNICATION OF RESULTS TO SCS COMMUNITY

Following Safety Committee review, these radon test results were emailed to the board on Tuesday, November 8, 2016. The final report of the Safety Committee will be presented to the SCS school board at its next, regularly scheduled meeting on November 16, 2016.

Results of these initial tests were then emailed to parents, faculty and staff on November 10, 2016, and posted to the SCS website on November 17, 2016. Results (in hardcopy) were made readily available to parents, guardians, students, school employees, school volunteers, administrators and community representatives at the school's office and on the SCS website as required by law.

A copy of this report will be provided to OHA and the Sherwood School District, with whom we have entered into our charter agreement, on November 17, 2016, following approval of the final report at the Sherwood Charter School Board of Directors Meeting. Thereafter, the SCS Board of Directors will provide the testing results to the Sherwood Community Friends Church, from whom it leases space and land.

Sherwood Charter School is committed to providing a safe environment for students and staff, and the swift completion of radon testing in its facility, five years ahead of the required deadline, demonstrates that commitment.

ATTACHMENTS:

- Appendix A:** "Step-by-Step Guide for Planning Radon Testing in Oregon Schools" in OHA's *Testing for Elevated Radon in Oregon Schools.*)
- Appendix B:** SCS Floor Plans for Main Building and Portables **Unavailable online.**
- Appendix C:** SCS Radon Test Kit Detector Log
- Appendix D:** Exposure in Bowser-Morner Radon Chamber
- Appendix E:** Air Chek, Inc., Laboratory Analysis Report

Appendix A: Step-by-step guide for planning radon testing in Oregon schools

Per ORS 332.166-167, Oregon school districts shall develop a plan for testing schools under their jurisdiction for elevated levels of radon. They shall submit it to the Oregon Health Authority on or before **Sept. 1, 2016**.

Below is a recommended step-by-step guide for planning for radon testing at a specific school site. It's intended to be used with the other information in this document.

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 and 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 and 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. It 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; create labels for them if they are not.

2. Determine the number of test kits needed.

- a) 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

- b) 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

a) 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.]

b) 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.]

c) 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.]

4. 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**

5. Use a “Test Kit Location Floor Plan” to create a “Test Kit Placement Log(s)”

The school radon measurement teams can use a template of the school’s emergency escape plan to decide in which rooms the different types of test kits (detectors, blanks and duplicates) will be placed. These documents will guide the planning of a radon testing effort as well as the actual testing itself.

SHERWOOD CHARTER SCHOOL
RADON TEST KIT PLACEMENT LOG

Appendix C

Test Kit #	Building	Current Room	Floor Plan ID	Start Date	Start Time	Stop Date	Stop Time	Floor	Kit Type	Reading
7136409	Main	Principal's Office	Principal's Office	10/25/2016	3:25 PM	10/28/2016	2:29 PM	1st	Detector	1.0 ± 0.3
7136413	Main	Principal's Office	Principal's Office	10/25/2016	3:25 PM	10/28/2016	2:21 PM	1st	Duplicate	1.1 ± 0.3
7136411	Main	School Office	Sch Main Office	10/25/2016	3:30 PM	10/28/2016	2:34 PM	1st	Detector	1.4 ± 0.3
7136415	Main	School Office	Sch Main Office	10/13/2016	4:02 PM	10/13/2016	4:02 PM	1st	Blank	???
7136412	Main	1st Grade	Classroom 1	10/25/2016	3:30 PM	10/28/2016	2:41 PM	1st	Detector	1.5 ± 0.3
7136405	Main	Kindergarten	Classroom 2	10/25/2016	3:30 PM	10/28/2016	2:44 PM	1st	Detector	1.3 ± 0.3
7136414	Main	Back Office	Sch Back Office	10/25/2016	3:30 PM	10/28/2016	2:47 PM	1st	Detector	1.2 ± 0.3
7136406	Main	Music Room	Classroom 3	10/25/2016	3:30 PM	10/28/2016	2:50 PM	1st	Detector	1.3 ± 0.3
7136430	Main	Work Rm (literacy)	Work Room	10/25/2016	3:35 PM	10/28/2016	2:52 PM	1st	Detector	1.2 ± 0.3
7136432	Main	Counselor Office	Counselor Office	10/25/2016	3:35 PM	10/28/2016	2:54 PM	1st	Detector	1.4 ± 0.3
7136431	Main	Copy Room	Copy Room	10/25/2016	3:35 PM	10/28/2016	2:57 PM	1st	Detector	1.2 ± 0.3
7136429	Portable	Art	Classroom 5	10/25/2016	4:10 PM	10/28/2016	3:04 PM	1st	Detector	<0.3
7136419	Portable	Art	Classroom 5	10/13/2016	4:05 PM	10/13/2016	4:05 PM	1st	Blank	???
7136428	Portable	Science	Classroom 4	10/25/2016	4:16 PM	10/28/2016	3:07 PM	1st	Detector	<0.3
7136410	Portable	Science	Classroom 4	10/25/2016	4:16 PM	10/28/2016	3:07 PM	1st	Duplicate	<0.3
7136407	Portable	Math	Classroom 7	10/25/2016	4:22 PM	10/28/2016	3:11 PM	1st	Detector	<0.3
7136425	Portable	Math	Classroom 7	10/25/2016	4:22 PM	10/28/2016	3:12 PM	1st	Duplicate	<0.3
7136418	Portable	Humanities	Classroom 6	10/13/2016	4:04 PM	10/13/2016	4:04 PM	1st	Blank	???
7136424	Portable	Humanities	Classroom 6	10/25/2016	4:25 PM	10/28/2016	3:16 PM	1st	Detector	<0.3
7136433	Portable	5th Grade	Classroom 9	10/25/2016	4:30 PM	10/28/2016	3:20 PM	1st	Detector	<0.3
7136427	Portable	5th Grade	Classroom 9	10/25/2016	4:30 PM	10/28/2016	3:20 PM	1st	Duplicate	<0.3
7136408	Portable	3rd Grade	Classroom 8	10/25/2016	4:35 PM	10/28/2016	3:25 PM	1st	Detector	<0.3
7136417	Portable	3rd Grade	Classroom 8	10/13/2016	4:03 PM	10/13/2016	4:03 PM	1st	Blank	???
7136426	Portable	2nd Grade	Classroom 10	10/25/2016	4:40 PM	10/28/2016	3:32 PM	1st	Detector	0.5 ± 0.2
7136423	Portable	2nd Grade	Classroom 10	10/25/2016	4:40 PM	10/28/2016	3:32 PM	1st	Duplicate	<0.3
7136422	Portable	4th Grade	Classroom 11	10/25/2016	4:42 PM	10/28/2016	3:37 PM	1st	Detector	???
7136416	Portable	4th Grade	Classroom 11	10/13/2016	3:50 PM	10/13/2016	3:59 PM	1st	Blank	???
7136404	QA								Spike	22.8 ± 1.9
7136420	QA								Spike	21.2 ± 1.8
7136421	QA								Spike	21.3 ± 1.8

OCTOBER 2016

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT Sherwood Charter School Job Number 177106NOMINAL Conditions: Radon Conc 25.4 pCi/L Rel. Hum 49.6 % Temp. 79.0 FDate Start: 10/21/16 Date Stop: 10/24/16 Date Start: _____ Date Stop: _____Time Start: 0952 Time Stop: 0952 Time Start: _____ Time Stop: _____Device No.'s: (3) Char. Bags. Device No.'s: _____7136404, 7136420, 7136421G3 Left

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)
 Background = 7 μ R/h Elevation = 820 ft

November 3, 2016

**** LABORATORY ANALYSIS REPORT ****

Pg 1 of 1

I5370 / RENEE SIMAS

Kit #	pCi/L	Hours	Started	Ended	Analyzed	NOTES	MST%	°F
7136404	22.8 ± 1.9	72	2016-10-21 @ 10:00 am	2016-10-24 @ 10:00 am	2016-11-01	D	6.5%	70
7136405	1.3 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.2%	70
7136406	1.3 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.2%	70
7136407	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		8.7%	70
7136408	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		8.0%	70
7136409	1.0 ± 0.3	71	2016-10-25 @ 3:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.9%	70
7136410	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		7.9%	70
7136411	1.4 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.9%	70
7136412	1.5 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.2%	70
7136413	1.1 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.9%	70
7136414	1.2 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.2%	70
7136415	????	0	2016-10-13 @ 4:00 pm	2016-10-13 @ 4:00 pm	2016-11-01	IB2	8.6%	70
7136416	????	0	2016-10-13 @ 4:00 pm	2016-10-13 @ 4:00 pm	2016-11-01	IB2	6.5%	70
7136417	????	0	2016-10-13 @ 4:00 pm	2016-10-13 @ 4:00 pm	2016-11-01	IB2	7.9%	70
7136418	????	0	2016-10-13 @ 4:00 pm	2016-10-13 @ 4:00 pm	2016-11-01	IB2	8.6%	70
7136419	????	0	2016-10-13 @ 4:00 pm	2016-10-13 @ 4:00 pm	2016-11-01	IB2	7.2%	70
7136420	21.2 ± 1.8	72	2016-10-21 @ 10:00 am	2016-10-24 @ 10:00 am	2016-11-01	D	7.3%	70
7136421	21.3 ± 1.8	72	2016-10-21 @ 10:00 am	2016-10-24 @ 10:00 am	2016-11-01	D	6.5%	70
7136422	????	0	0000-00-00 @	2016-10-28 @ 3:00 pm	2016-11-01	MI	8.6%	70
7136423	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		9.3%	70
7136424	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		8.6%	70
7136425	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		7.2%	70
7136426	0.5 ± 0.2	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		9.3%	70
7136427	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		8.6%	70
7136428	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		8.6%	70
7136429	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		7.9%	70
7136430	1.2 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.2%	70
7136431	1.2 ± 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		7.2%	70
7136432	1.4 ± 0.3	70	2016-10-25 @ 4:00 pm	2016-10-28 @ 2:00 pm	2016-11-01		7.9%	70
7136433	< 0.3	71	2016-10-25 @ 4:00 pm	2016-10-28 @ 3:00 pm	2016-11-01		8.6%	70