



March 14, 2024

Lelisa Rozendal
Beaverton School District
2180 SW 170th Avenue
Beaverton, OR 97003

Via email: lelisa_rozendal@beaverton.k12.or.us

Regarding: Follow-Up Radon Testing
 Ridgewood Elementary School
 10100 SW Inglewood Street
 Beaverton, Oregon 97225
 PBS Project 27121.030

Dear Ms. Rozendal:

From February 26, through February 29, 2024, PBS Engineering and Environmental Inc. (PBS) performed follow-up short-term radon testing at Ridgewood Elementary School, located at 10100 SW Inglewood Street in Beaverton, Oregon.

The purpose of the follow-up testing was to measure radon concentrations to compare against January 2023 sampling, following the installation of a radon mitigation system at the school.

The Environmental Protection Agency (EPA) recommends, and the Oregon Health Authority (OHA) requires, that school buildings be tested for radon and that radon concentrations be maintained below 4.0 picocuries per liter (pCi/L) of air. PBS used Radonova, brand single-use, short-term radon test kits to measure radon levels in all frequently occupied rooms that are in contact with the ground or above unoccupied basements or crawlspaces.

All samples were below the limit of detection or revealed very low concentrations of radon. All samples were below 4.0 pCi/L of air.

Each of the rooms that had elevated radon concentrations, above 4 pCi/L of air in January 2023, including rooms A114, B108, and C116, tested below the limit of detection.

Please see the attached laboratory analysis report for more details.

In addition to the EPA recommendation that radon concentrations not exceed 4.0 pCi/L, OHA recommends that the following steps be conducted based on the results of a room's initial short-term test:

- **If the result is less than 2.0 pCi/L**, school districts are required to test again every 10 years, per Oregon Revised Statute 332.166-167.
- **If the result is between 2.0 pCi/L and 4.0 pCi/L**, consider fixing (i.e., lowering) the radon in that room.

- **If the result is from 4.0 pCi/L to 8.0 pCi/L**, perform a follow-up measurement of that room using a long-term test. This test should be conducted over as much of a nine-month school year as possible, when the room is likely to be occupied. If that result is equal to or greater than 4.0 pCi/L, the radon in the room should be fixed (i.e., lowered).
- **If the initial short-term test result is equal to or greater than 8.0 pCi/L**, conduct a second short-term test and average its result with the initial short-term test result. If the average of the two is equal to or greater than 4.0 pCi/L, radon in the room should be fixed (i.e., lowered).

Note: A great difference in the results of the short-term tests may indicate a flaw in the testing process. Investigate and consider retesting. For situations in which one of the test results is equal to or greater than 4.0 pCi/L, if the higher result is two or more times the lower result, repeat the test.

LIMITATIONS OF SCOPE

This study was limited to the tests and locations as previously indicated. The site as a whole may have other environmental concerns that will not be characterized by this study. The findings and conclusions of this work are not scientific certainties, but probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. PBS is not able to represent conditions on the site or adjoining sites beyond those detected or observed by PBS.

Please feel free to contact me at 503.417.7603 or rich@pbsusa.com with any questions or comments.

Sincerely,

Rich Dufresne
Senior Project Manager
PBS Engineering and Environmental Inc.

Attachment: Radonova Laboratory Analysis Report

PBS Engineering

Kiera Yap

RADON MONITORING REPORT

Description of the measurement

The measurement was performed with Activated Charcoal Adsorption by Alpha Energy Laboratories (NRPP ID: 101132 AL).

The detector(s) arrived to Alpha Energy Laboratories, Inc. **03/05/2024**.

They were measured **03/05/2024**.

Test data have been given by PBS Engineering

Property data and address

MEASURE SITE ADDRESS

Portland Public Schools

10100 SW Inglewood Street

Beaverton OR 97225

BUILDING ID

Ridgewood Elementary School

Test results

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	ROOM	FLOOR	RADON RESULT
RK134788 [QuickScreen]	02/26/2024 06:29 AM – 02/29/2024 06:34 AM	Room A100, Standard			1.0 ± 0.8 pCi/L
RK134828 [QuickScreen]	02/26/2024 06:31 AM – 02/29/2024 06:35 AM	Room A102, Standard			< 1.1 pCi/L
RK134753 [QuickScreen]	02/26/2024 06:33 AM – 02/29/2024 06:36 AM	Room A104, Standard			< 1.0 pCi/L
RK135145 [QuickScreen]	02/26/2024 06:33 AM – 02/29/2024 06:36 AM	Room A104, Duplicate			< 0.7 pCi/L
RK134837 [QuickScreen]	02/26/2024 06:35 AM – 02/29/2024 06:37 AM	Room A108, Standard			< 0.9 pCi/L
RK134437 [QuickScreen]	02/26/2024 06:36 AM – 02/29/2024 06:38 AM	Room 108, Standard			< 0.6 pCi/L
RK134798 [QuickScreen]	02/26/2024 06:40 AM – 02/29/2024 06:39 AM	Room A114, Standard			< 1.0 pCi/L

Comment to the results

Trygve Rönqvist (Electronically signed)

Signature Radonova Laboratories Laboratory Measurement Specialist

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1 EAST 22nd STREET, SUITE 200

LOMBARD, IL 60148

331.814.2200, help@radonova.com

PBS Engineering
Kiera Yap

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	ROOM	FLOOR	RADON RESULT
RK134797 [QuickScreen]	02/26/2024 06:42 AM – 02/29/2024 06:40 AM	Gym, Standard			1.1 ± 0.8 pCi/L
RK135237 [QuickScreen]	02/26/2024 06:43 AM – 02/29/2024 06:41 AM	Gym, Standard			< 0.8 pCi/L
RK135099 [QuickScreen]	02/26/2024 06:45 AM – 02/29/2024 06:43 AM	A103, Standard			1.0 ± 0.4 pCi/L
RK135073 [QuickScreen]	02/26/2024 06:47 AM – 02/29/2024 06:45 AM	Multipurpose room, Standard			< 0.8 pCi/L
RK135075 [QuickScreen]	02/26/2024 06:47 AM – 02/29/2024 06:45 AM	Multipurpose room, Standard			< 0.8 pCi/L
RK135174 [QuickScreen]	02/26/2024 06:53 AM – 02/29/2024 06:46 AM	Kitchen, Standard			< 0.9 pCi/L
RK134765 [QuickScreen]	02/26/2024 06:55 AM – 02/29/2024 06:47 AM	Cafeteria, Standard			< 1.0 pCi/L
RK135170 [QuickScreen]	02/26/2024 06:55 AM – 02/29/2024 06:47 AM	Cafeteria, Standard			< 0.7 pCi/L
RK134822 [QuickScreen]	02/26/2024 06:58 AM – 02/29/2024 06:50 AM	Social worker, Standard			< 0.5 pCi/L

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RK135057 [QuickScreen]	02/26/2024 07:01 AM – 02/29/2024 06:52 AM	Conference room 1, Standard			< 0.8 pCi/L
RK135083 [QuickScreen]	02/26/2024 07:02 AM – 02/29/2024 06:52 AM	Conference room 1A, Standard			1.0 ± 0.5 pCi/L
RK134800 [QuickScreen]	02/26/2024 07:03 AM – 02/29/2024 06:53 AM	Speech psychologist, Standard			2.2 ± 0.6 pCi/L
RK135211 [QuickScreen]	02/26/2024 07:05 AM – 02/29/2024 06:54 AM	Resource room, Standard			1.8 ± 0.6 pCi/L
RK135077 [QuickScreen]	02/26/2024 07:05 AM – 02/29/2024 06:54 AM	Resource room, Duplicate			1.8 ± 0.5 pCi/L
RK135042 [QuickScreen]	02/26/2024 07:07 AM – 02/29/2024 06:56 AM	Staff room, Standard			< 0.9 pCi/L
RK134741 [QuickScreen]	02/26/2024 07:09 AM – 02/29/2024 07:29 AM	Office, Standard			1.1 ± 0.7 pCi/L
RK135091 [QuickScreen]	02/26/2024 07:11 AM – 02/29/2024 07:31 AM	Health, Standard			< 0.7 pCi/L
RK135071 [QuickScreen]	02/26/2024 07:13 AM – 02/29/2024 07:31 AM	Workroom, Standard			< 0.6 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	ROOM	FLOOR	RADON RESULT
RK135178 [QuickScreen]	02/26/2024 07:15 AM – 02/29/2024 06:59 AM	B118, Standard			< 0.6 pCi/L
RK135130 [QuickScreen]	02/26/2024 07:15 AM – 02/29/2024 06:59 AM	B118, Duplicate			0.8 ± 0.5 pCi/L
RK135183 [QuickScreen]	02/26/2024 07:18 AM – 02/29/2024 07:35 AM	Conference room 2B, Standard			< 0.6 pCi/L
RK135052 [QuickScreen]	02/26/2024 07:19 AM – 02/29/2024 07:01 AM	Production room B, Standard			< 0.6 pCi/L
RK135065 [QuickScreen]	02/26/2024 07:20 AM – 02/29/2024 07:02 AM	Room B116, Standard			< 0.8 pCi/L
RK134793 [QuickScreen]	02/26/2024 07:21 AM – 02/29/2024 07:03 AM	Room B114, Standard			< 0.8 pCi/L
RK134744 [QuickScreen]	02/26/2024 07:22 AM – 02/29/2024 07:04 AM	Room B112, Standard			< 1.1 pCi/L
RK135209 [QuickScreen]	02/26/2024 07:23 AM – 02/29/2024 07:05 AM	Room B110, Standard			< 0.7 pCi/L
RK134790 [QuickScreen]	02/26/2024 07:24 AM – 02/29/2024 07:06 AM	Room B108, Standard			< 1.0 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	ROOM	FLOOR	RADON RESULT
RK135064 [QuickScreen]	02/26/2024 07:27 AM – 02/29/2024 07:11 AM	Library, Standard			< 0.7 pCi/L
RK135043 [QuickScreen]	02/26/2024 07:27 AM – 02/29/2024 07:11 AM	Library, Standard			< 0.6 pCi/L
RK135234 [QuickScreen]	02/26/2024 07:28 AM – 02/29/2024 07:12 AM	B120, Standard			< 0.8 pCi/L
RK134785 [QuickScreen]	02/26/2024 07:29 AM – 02/29/2024 07:12 AM	B120, Duplicate			< 0.9 pCi/L
RK135173 [QuickScreen]	02/26/2024 07:31 AM – 02/29/2024 07:14 AM	C118, Standard			< 0.8 pCi/L
RK135242 [QuickScreen]	02/26/2024 07:32 AM – 02/29/2024 07:15 AM	C116, Standard			< 0.7 pCi/L
RK135223 [QuickScreen]	02/26/2024 07:33 AM – 02/29/2024 07:16 AM	C114, Standard			< 0.9 pCi/L
RK135163 [QuickScreen]	02/26/2024 07:35 AM – 02/29/2024 07:17 AM	C112, Standard			< 0.8 pCi/L
RK135128 [QuickScreen]	02/26/2024 07:36 AM – 02/29/2024 07:18 AM	C110, Standard			< 0.7 pCi/L

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RK135066 [QuickScreen]	02/26/2024 07:37 AM – 02/29/2024 07:19 AM	C108, Standard			< 0.7 pCi/L
RK135188 [QuickScreen]	02/26/2024 07:38 AM – 02/29/2024 07:20 AM	Room C106, Standard			< 0.6 pCi/L
RK134769 [QuickScreen]	02/26/2024 07:40 AM – 02/29/2024 07:20 AM	Room C106, Duplicate			< 1.0 pCi/L
RK135120 [QuickScreen]	02/26/2024 07:42 AM – 02/29/2024 07:21 AM	Room C104, Standard			< 0.7 pCi/L
RK135159 [QuickScreen]	02/26/2024 07:47 AM – 02/29/2024 07:29 AM	Principals office, Standard			< 0.8 pCi/L
RK134745 [QuickScreen]	02/26/2024 07:50 AM – 02/29/2024 07:33 AM	PE office, Standard			1.3 ± 0.7 pCi/L
RK135103 [QuickScreen]	02/26/2024 07:50 AM – 02/29/2024 07:36 AM	BLANK, Blank			< 0.6 pCi/L

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What Does My Result Mean?

The United States Environmental Protection Agency (EPA) recommends remediation if the results of one long-term test (greater than 90 days) or one short-term test with a continuous monitor or the average of two passive short-term (less than 90 days) tests* conducted in the lowest lived-in level of the home report at or above 4.0 pCi/L. *If an initial short-term test result is less than 4 pCi/L, a follow-up measurement is probably not needed. If an initial short-term test result is between 4 pCi/L and 8 pCi/L, a long-term or a short-term follow-up measurement is recommended. If an initial short-term test result is greater than 8 pCi/L, a short-term follow-up measurement is recommended. For more information, or to find a certified mitigation professional, contact your state radon office, the National Radon Proficiency Program (www.nrpp.info) or the National Radon Safety Board (www.nrsb.org).

Result (pCi/L)	Recommended Action
Less than 2.0	Retest the building at least every 5 years
2.0 - 3.9	Consider Mitigation, retest the building at last every 5 years
4.0 or Higher	Mitigate, test again at least every 2 years to ensure that the system remains effective

Measurement method: Activated Charcoal Adsorption

For this method using the QuickScreen detector, the airtight container with activated charcoal is opened in the area to be sampled and radon in the air adsorbs onto the charcoal granules. At the end of the sampling period, the container is sealed and may be sent to a laboratory for analysis. The gamma decay from the radon adsorbed to the charcoal is counted on a scintillation detector and a calculation based on calibration information is used to calculate the radon concentration at the sample site.

Measured radon concentrations

For each detector, the measured value of the radon concentration is provided. For each value an uncertainty associated with the measurement to a 95% confidence level is also provided. For example a measurement result of 4.0 ± 0.5 pCi/L means that the radon concentration is most likely contained in the range 3.5 - 4.5 pCi/L. If the start or end date of the measurement has not been provided, the radon concentration cannot be calculated. In such cases, the total exposure in pCi*days/L will be reported. The reported measured values are related to the detectors as received by Radonova Laboratories. Detector deployment is not performed by Radonova Laboratories. Measurement information such as monitoring period (dates) and placement location is provided to Radonova Laboratories by the end user. The presented results apply only to the samples tested.

Codes on non-reportable detectors

DNR	Not Reported – Detector Not Returned
ERR	Not Reported – See comment

Measurement method versions used when the report was created

ANSI/AARST MAH-2023, Protocol for Conducting Measurements of Radon and Radon Decay Products in Homes
ANSI/AARST MA-MFLB-2023, Protocol for Measurements of Radon in Multifamily, School, Commercial and Mixed-Use Buildings

Radon measurements in the US

The United States Environmental Protection Agency (EPA) recommends remediation if the results of one long-term test or the average of two short-term tests conducted in the lowest lived-in level of the home report at or above 4.0 pCi/L. The average yearly residential indoor radon level in the US is estimated to be around 1.3 pCi/L. Long-term tests are conducted for more than 90 days. Short-term tests are conducted between 2 and 90 days and should be performed under closed building conditions. If an initial short-term test result is less than 4 pCi/L, a follow-up measurement is probably not needed. If an initial short-term test result is greater than 10 pCi/L, a short-term follow-up measurement is recommended in order to get a fast result. If an initial short-term test result is between 4 pCi/L and 10 pCi/L, a long-term or a short-term follow-up measurement is recommended. For more information about the interpretation of your test results or about other radon related issues we suggest contacting your state radon office.

Your state radon office should have the available EPA publications:

- A Citizen's Guide to Radon
- Home Buyer's and Seller's Guide to Radon
- Consumer's Guide to Radon Reduction

Signature on the report

With the signature on the report, the Measurement specialist at Radonova Laboratories certifies that the quality control procedures follows the guidance in accordance with the AARST/ANSI Measurement Protocols. Measurement information displayed in italics on report has been provided by the customer.

Certification no:

101132-AL, 107830-RT, NY ELAP ID: 11430

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