



January 15, 2024

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

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

Regarding: Radon Testing
 Barnes Elementary School
 13730 SW Walker Road
 Beaverton, Oregon 97005
 PBS Project 27121.028, Phase 0001

Dear Ms. Rozendal:

From December 19, to December 22, 2023, PBS Engineering and Environmental Inc. (PBS) performed short-term radon testing at Barnes Elementary School, located at 13730 SW Walker Road in Portland, Oregon.

The Environmental Protection Agency (EPA) recommends, and the Oregon Health Authority (OHA) requires, that school buildings be tested for radon, and that any 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 frequently occupied rooms that are in contact with the ground or above unoccupied basements or crawlspaces.

Laboratory results indicate that all short-term radon test results at Barnes Elementary School were below 4.0 pCi/L.

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 503.209.1500 or rich@pbsusa.com with any questions or comments.

Sincerely,

Rich Dufrense
Senior Project Manager

Attachment: Radonova Laboratory Analysis Report

PBS Engineering
Ellie Dick, Taylor Cook

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. **12/26/2023**. They were measured **12/26/2023**.

Test data have been given by PBS Engineering

Property data and address

MEASURE SITE ADDRESS

*Barnes Elementary School
13730 SW Walker Rd*

BUILDING ID

27121.028

Test results

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK130475 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	main office, Standard		1.6 pCi/L
RK130892 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	main office health, Standard		1.5 pCi/L
RK130478 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	lib, Standard		< 0.8 pCi/L
RK130648 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	lib, Standard		< 0.8 pCi/L
RK129982 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	B104, Standard		0.7 pCi/L
RK130662 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	lib office B2, Standard		0.7 pCi/L
RK130490 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	B106, Standard		< 0.7 pCi/L

Comment to the results

Trygve Rönqvist (Electronically signed)

Signature Radonova Laboratories Laboratory Measurement Specialist

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331.814.2200, help@radonova.com

PBS Engineering
Ellie Dick, Taylor Cook

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK130483 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:31 AM	B108, Standard		DNR
RK129977 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	B100, Standard		1.3 pCi/L
RK130891 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	kitchen, Standard		< 1.2 pCi/L
RK130887 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	caf?, Standard		0.7 pCi/L
RK129987 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	caf?, Standard		< 0.5 pCi/L
RK130897 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	caf?, Duplicate		< 0.5 pCi/L
RK130494 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A005, Standard		< 0.5 pCi/L
RK130485 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:31 AM	A007, Standard		DNR
RK130272 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A007, Standard		0.6 pCi/L

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RK130271 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A006, Standard		< 0.6 pCi/L
RK130467 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A008, Standard		< 0.7 pCi/L
RK130476 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A011, Standard		1.9 pCi/L
RK129986 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A011, Duplicate		1.3 pCi/L
RK130862 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A110, Standard		< 1.0 pCi/L
RK130875 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	gym, Standard		1.0 pCi/L
RK130898 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	gym, Standard		< 0.7 pCi/L
RK130262 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	gym, Standard		< 0.7 pCi/L
RK127704 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	gym, Duplicate		< 0.7 pCi/L

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PBS Engineering
Ellie Dick, Taylor Cook

BY
PBS Engineering & Environmental

REPORT RECEIVER(S)
john.yuly@pbsusa.com
PBS Engineering & Environmental

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RK130618 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A111, Standard		< 0.6 pCi/L
RK127696 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A110, Standard		< 0.6 pCi/L
RK130470 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A108, Standard		< 0.5 pCi/L
RK129984 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A109, Standard		0.5 pCi/L
RK130484 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A106, Standard		0.4 pCi/L
RK130254 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A107, Standard		< 0.7 pCi/L
RK130255 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A105, Standard		< 0.6 pCi/L
RK130277 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	office A1, Standard		< 0.8 pCi/L
RK130263 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	wrk rm A1, Standard		0.7 pCi/L

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RK130276 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A103, Standard		< 0.8 pCi/L
RK130692 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A103, Duplicate		< 0.9 pCi/L
RK130493 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A101, Standard		0.8 pCi/L
RK130278 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A102, Standard		< 1.0 pCi/L
RK130256 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	A100, Standard		< 0.6 pCi/L
RK130264 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	staff rm, Standard		< 0.8 pCi/L
RK130463 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	staff mail rm, Standard		1.9 pCi/L
RK130489 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	conf, Standard		1.2 pCi/L
RK130876 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	off ?, Standard		1.6 pCi/L

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RK130657 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	princ, Standard		0.8 pCi/L
RK130251 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C101D, Standard		0.6 pCi/L
RK130244 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C101C, Standard		1.3 pCi/L
RK130291 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C100, Standard		< 1.0 pCi/L
RK130288 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C101, Standard		< 0.7 pCi/L
RK129989 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C101B, Standard		1.3 pCi/L
RK130863 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C101A, Standard		< 0.6 pCi/L
RK130880 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C102, Standard		0.7 pCi/L
RK130487 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C104, Standard		1.0 pCi/L

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RK129968 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C102, Duplicate		0.7 pCi/L
RK130882 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C103, Standard		1.2 pCi/L
RK130678 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C106, Standard		< 0.6 pCi/L
RK130614 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C105, Standard		0.7 pCi/L
RK130851 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C107, Standard		< 0.9 pCi/L
RK130451 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C109, Standard		1.1 pCi/L
RK130236 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C111, Standard		< 0.8 pCi/L
RK130884 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C113, Standard		< 0.6 pCi/L
RK130826 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C113, Duplicate		< 0.8 pCi/L

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RK130817 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C115, Standard		< 0.6 pCi/L
RK130443 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C115, Duplicate		< 0.7 pCi/L
RK130452 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	C108, Standard		< 0.8 pCi/L
RK130832 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	P4, Standard		< 0.7 pCi/L
RK130670 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	P1, Standard		0.6 pCi/L
RK130625 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	P2, Standard		< 0.8 pCi/L
RK130600 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 08:30 AM	P3, Standard		< 0.5 pCi/L
RK130518 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 01:53 PM	blank, Blank		< 0.8 pCi/L
RK130519 [QuickScreen]	12/19/2023 12:30 PM – 12/22/2023 01:53 PM	blank, Blank		< 0.7 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
<i>RK130531 [QuickScreen]</i>	<i>12/19/2023 12:30 PM – 12/22/2023 01:53 PM</i>	<i>blank, Blank</i>		<i>< 0.7 pCi/L</i>
<i>RK130729 [QuickScreen]</i>	<i>12/19/2023 12:30 PM – 12/22/2023 01:53 PM</i>	<i>blank, Blank</i>		<i>< 0.5 pCi/L</i>

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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 Multifamily Buildings, Schools and Large Buildings

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 an occupied room are 4.0 pCi/L or higher. 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 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 in order to get a fast result.

More information about radon measurements and mitigation can be found in the ANSI/AARST publications:

- ANSI/AARST Protocol for Conducting Measurements of Radon and Radon-Decay Products in Schools and Large Buildings.
- ANSI/AARST Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily Buildings.
- ANSI/AARST Radon Mitigation Standards for Schools and Large Buildings.
- ANSI/AARST Radon Mitigation Standards for Multifamily Buildings.

For more information about the interpretation of your test results or about other radon related issues we suggest contacting your state radon office.

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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