February 12, 2025

Molly Howell
Project Coordinator
Beaverton School District

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

Regarding: Short-Term Radon Testing
Sato Elementary School
7775 NW Kaiser Road
Portland, Oregon 97229

Ms. Howell:

From January 27 to January 30, 2025, PBS Engineering and Environmental Inc. (PBS) performed short-term radon testing at Sato Elementary School in Portland, Oregon.

METHODOLOGY

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, Inc., 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. These rooms include classrooms, offices, break rooms, conference rooms, gyms, and cafeterias. Restrooms, hallways, stairwells, storage rooms, and closets are not tested. Testing was completed during the winter heating season and during a regular school week when building use and operations are normal.

PBS endeavored to use sample location names based on existing room numbers or common-sense descriptions. In buildings or areas where no room number or other designation was available, PBS assigned names or numbers to the rooms. In some circumstances, small numbers of test kits go missing during the testing period and those locations are not tested. PBS will evaluate whether or not the missing area should be retested based on the results of surrounding areas.

RESULTS

Laboratory results found concentrations below the EPA action level of 4 pCi/L in all tested locations in the building. Please see the attached laboratory analysis report for more details and testing locations.

In addition to the EPA recommendation that radon concentrations be maintained below 4.0 pCi/L, OHA recommends the following steps 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,

Digitally signed by Rich Dufresne
Date: 2025.02.12 09:42:29 -08'00'

Rich Dufresne
Senior Project Manager

Attachment: Radonova Laboratory Analysis Report

radonova
The global leader in radon measurement

REPORT NUMBER
6689301:1

REPORT DATE
02/07/2025

REPORT PAGE
1 of 7

PRINT DATE
02/07/2025

OWN ID
24010915

BY
Apex Companies LLC (Portland)

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. **02/03/2025**.
They were measured **02/03/2025**.

The detectors were deployed by Rich Dufresne and retrieved by Rich Dufresne

Property data and address

MEASURE SITE ADDRESS
Sato Elementary School

BUILDING ID

Test results

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	ROOM	FLOOR	RADON RESULT
RK150509 [QuickScreen]	*01/27/2025 11:02 AM – 01/30/2025 02:09 PM*	*Front office, Standard*			< 0.6 pCi/L
RK149066 [QuickScreen]	*01/27/2025 11:08 AM – 01/30/2025 02:20 PM*	*A103 workroom, Standard*			1.1 pCi/L
RK150542 [QuickScreen]	*01/27/2025 11:10 AM – 01/30/2025 02:20 PM*	*A114 staff lounge, Standard*			< 0.6 pCi/L
RK150508 [QuickScreen]	*01/27/2025 11:11 AM – 01/30/2025 02:09 PM*	*A112 assistant principal, Standard*			< 0.5 pCi/L
RK150557 [QuickScreen]	*01/27/2025 11:12 AM – 01/30/2025 02:10 PM*	*A110 office, Standard*			0.7 pCi/L
RK149068 [QuickScreen]	*01/27/2025 11:13 AM – 01/30/2025 02:18 PM*	*A108 office, Standard*			< 0.9 pCi/L
RK149015 [QuickScreen]	*01/27/2025 11:14 AM – 01/30/2025 03:06 PM*	*A106 conference, Standard*			< 0.6 pCi/L

Comment to the results

Steve Leslie (Electronically signed)

Signature Radonova Laboratories Laboratory Measurement Specialist

RADONOVA INC.
1 EAST 22nd STREET, SUITE 200
LOMBARD, IL 60148
331.814.2200, help@radonova.com

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RK149078 [QuickScreen]	*01/27/2025 11:17 AM – 01/30/2025 02:14 PM*	*A104 principal office, Standard*			< 0.6 pCi/L
RK150582 [QuickScreen]	*01/27/2025 11:18 AM – 01/30/2025 02:14 PM*	*A105 health room, Standard*			0.7 pCi/L
RK149024 [QuickScreen]	*01/27/2025 11:19 AM – 01/30/2025 02:39 PM*	*B102A multipurpose room, Standard*			< 0.6 pCi/L
RK149057 [QuickScreen]	*01/27/2025 11:20 AM – 01/30/2025 02:40 PM*	*B103 office, Standard*			< 0.5 pCi/L
RK148982 [QuickScreen]	*01/27/2025 11:20 AM – 01/30/2025 02:39 PM*	*B102B, Standard*			0.8 pCi/L
RK150530 [QuickScreen]	*01/27/2025 11:21 AM – 01/30/2025 02:40 PM*	*B106, Standard*			0.7 pCi/L
RK150559 [QuickScreen]	*01/27/2025 11:21 AM – 01/30/2025 02:40 PM*	*B108, Standard*			< 0.6 pCi/L
RK148983 [QuickScreen]	*01/27/2025 11:21 AM – 01/30/2025 02:38 PM*	*B107, Standard*			< 0.6 pCi/L
RK147714 [QuickScreen]	*01/27/2025 11:22 AM – 01/30/2025 02:38 PM*	*B111, Standard*			0.6 pCi/L

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RK150495 [QuickScreen]	*01/27/2025 11:22 AM – 01/30/2025 02:43 PM*	*B110, Standard*			< 0.6 pCi/L
RK150503 [QuickScreen]	*01/27/2025 11:22 AM – 01/30/2025 02:43 PM*	*B112, Standard*			< 0.5 pCi/L
RK149067 [QuickScreen]	*01/27/2025 11:24 AM – 01/30/2025 02:36 PM*	*F101 kitchen, Standard*			< 0.7 pCi/L
RK150570 [QuickScreen]	*01/27/2025 11:24 AM – 01/30/2025 02:36 PM*	*F101 kitchen, Standard*			< 0.7 pCi/L
RK149048 [QuickScreen]	*01/27/2025 11:26 AM – 01/30/2025 02:22 PM*	*Cafeteria commons, Standard*			< 0.8 pCi/L
RK149039 [QuickScreen]	*01/27/2025 11:26 AM – 01/30/2025 02:22 PM*	*Cafeteria commons, Standard*			< 0.6 pCi/L
RK150546 [QuickScreen]	*01/27/2025 11:29 AM – 01/30/2025 02:25 PM*	*C118, Standard*			< 0.6 pCi/L
RK150522 [QuickScreen]	*01/27/2025 11:38 AM – 01/30/2025 02:27 PM*	*G114, Standard*			1.0 pCi/L
RK146988 [QuickScreen]	*01/27/2025 11:40 AM – 01/30/2025 02:28 PM*	*G102, Standard*			< 0.6 pCi/L

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RK147043 [QuickScreen]	*01/27/2025 11:40 AM – 01/30/2025 02:28 PM*	*G104, Standard*			< 0.8 pCi/L
RK147021 [QuickScreen]	*01/27/2025 11:41 AM – 01/30/2025 02:30 PM*	*G106, Standard*			0.7 pCi/L
RK146998 [QuickScreen]	*01/27/2025 11:41 AM – 01/30/2025 02:30 PM*	*G106 DUP, Duplicate*			< 0.6 pCi/L
RK150531 [QuickScreen]	*01/27/2025 11:42 AM – 01/30/2025 02:30 PM*	*G108, Standard*			< 0.7 pCi/L
RK149056 [QuickScreen]	*01/27/2025 11:42 AM – 01/30/2025 02:34 PM*	*G112, Standard*			< 0.9 pCi/L
RK150517 [QuickScreen]	*01/27/2025 11:43 AM – 01/30/2025 02:31 PM*	*Library, Standard*			< 0.6 pCi/L
RK150590 [QuickScreen]	*01/27/2025 11:43 AM – 01/30/2025 02:31 PM*	*Library, Standard*			< 0.6 pCi/L
RK150502 [QuickScreen]	*01/27/2025 11:46 AM – 01/30/2025 02:49 PM*	*Gym, Standard*			< 0.6 pCi/L
RK146963 [QuickScreen]	*01/27/2025 11:46 AM – 01/30/2025 02:49 PM*	*Gym, Standard*			< 0.4 pCi/L

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RK147013 [QuickScreen]	*01/27/2025 11:47 AM – 01/30/2025 02:49 PM*	*Gym office C111, Standard*			< 0.6 pCi/L
RK147019 [QuickScreen]	*01/27/2025 11:51 AM – 01/30/2025 02:50 PM*	*Stage, Standard*			< 0.5 pCi/L
RK146985 [QuickScreen]	*01/27/2025 11:52 AM – 01/30/2025 02:55 PM*	*D118 music room, Standard*			< 0.4 pCi/L
RK146980 [QuickScreen]	*01/27/2025 11:52 AM – 01/30/2025 02:55 PM*	*D118 music room DUP, Duplicate*			< 0.5 pCi/L
RK146962 [QuickScreen]	*01/27/2025 11:53 AM – 01/30/2025 03:01 PM*	*Music office/storage room, Standard*			0.7 pCi/L
RK146989 [QuickScreen]	*01/27/2025 11:54 AM – 01/30/2025 02:59 PM*	*D102, Standard*			< 0.6 pCi/L
RK147036 [QuickScreen]	*01/27/2025 11:56 AM – 01/30/2025 02:59 PM*	*D104, Standard*			< 0.7 pCi/L
RK147045 [QuickScreen]	*01/27/2025 11:56 AM – 01/30/2025 02:59 PM*	*D104 DUP, Duplicate*			0.7 pCi/L
RK147040 [QuickScreen]	*01/27/2025 11:58 AM – 01/30/2025 02:55 PM*	*D112 flex commons, Standard*			< 0.5 pCi/L

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RK148985 [QuickScreen]	*01/27/2025 11:59 AM – 01/30/2025 02:56 PM*	*D110, Standard*			< 0.7 pCi/L
RK149069 [QuickScreen]	*01/27/2025 12:00 PM – 01/30/2025 02:56 PM*	*D108 DUP, Duplicate*			< 0.7 pCi/L
RK149026 [QuickScreen]	*01/27/2025 12:00 PM – 01/30/2025 02:56 PM*	*D108 DUP, Duplicate*			< 0.6 pCi/L
RK150540 [QuickScreen]	*01/27/2025 12:00 PM – 01/30/2025 02:56 PM*	*D106, Standard*			< 0.5 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 least 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 result applies only to the sample tested as received by the laboratory.

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 per-formed 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-RMP, NY ELAP ID: 11430

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