



September 15, 2022

Brent Paul, Director of Facility Operations  
Lake Oswego School District  
2455 Country Club Road  
Lake Oswego, Oregon 97034

Via email: paulb@loswego.k12.or.us

Regarding: Radon Testing  
Westridge Elementary School  
3400 Royce Way  
Lake Oswego, Oregon 97034  
PBS Project 21600.051

Dear Mr. Paul:

From March 15 to March 17, 2022, PBS Engineering and Environmental Inc. (PBS) performed short-term radon testing at Westridge Elementary School located at 3400 Royce Way in Lake Oswego, Oregon.

The Environmental Protection Agency (EPA) and Oregon Health Authority (OHA) recommend that 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 activated charcoal adsorption detector 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 crawl spaces. The test kits were shipped under chain-of-custody to Alpha Energy Laboratories (National Radon Proficiency Program ID: 101132 AL) for analysis.

**Laboratory results indicated that all short-term radon tests at Westridge Elementary School were below 4.0 pCi/L.**

See the attached laboratory analysis report for sample locations and additional details.

In addition to the EPA recommendation that radon concentrations do 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 503.417.7607 or [bob.kleckner@pbsusa.com](mailto:bob.kleckner@pbsusa.com) with any questions or comments.

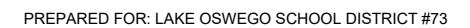
Sincerely,

Bob Kleckner  
Sr. Project Manager

Attachment: Floor Plan  
Radonova Laboratory Analysis Radon Monitoring Report

1. THIS DRAWING IS DIAGRAMMATIC. IT IS FOR GENERAL INFORMATION AND SAMPLE LOCATIONS.

● RK# RADON TEST AND KIT NUMBER

[illegible]

DRAWN BY JAB
CHECKED: BK
DATE: SEPTEMBER 2022
PROJECT NUMBER: 21600.051
SHEET DRAWING NO: <b>RA18</b>
SHEET <b>18</b> OF <b>18</b>

S. Eckes  
Lake Oswego

BY  
PBS Engineering & Environmental

REPORT RECEIVER(S)  
alex.johnson@pbsusa.com;lindsey.peterson@pbsusa.com  
S. Eckes

## RADON MONITORING REPORT

### Description of the measurement

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

The detector(s) arrived to Alpha Energy Laboratories, Inc. **03/22/2022**.  
They were measured **03/22/2022**.

*Test data have been given by S. Eckes*

### Property data and address

MEASURE SITE ADDRESS  
Westridge ES

BUILDING ID  
21600.051

### Test results

DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK109597 [QuickScreen]	03/15/2022 07:08 AM – 03/17/2022 01:08 PM	under veridesk, Main office	First	< 0.6 pCi/L
RK109581 [QuickScreen]	03/15/2022 07:09 AM – 03/17/2022 01:18 PM	next to printer, "Room 172, prinicpals office"	First	< 0.6 pCi/L
RK109616 [QuickScreen]	03/15/2022 07:10 AM – 03/17/2022 01:10 PM	on fridge, "Room 173, staff room"	First	< 0.6 pCi/L
RK109621 [QuickScreen]	03/15/2022 07:10 AM – 03/17/2022 01:17 PM	paper towel dispenser, Health room	First	< 0.6 pCi/L
RK109599 [QuickScreen]	03/15/2022 07:11 AM – 03/17/2022 01:10 PM	paper towel dispenser, Workroom off of office	First	< 0.7 pCi/L
RK110407 [QuickScreen]	03/15/2022 07:15 AM – 03/17/2022 02:06 PM	bookshelf of west wall, CR14	First	< 0.7 pCi/L
RK110444 [QuickScreen]	03/15/2022 07:17 AM – 03/17/2022 02:08 PM	bookshelf behind desk, CR15	First	< 0.6 pCi/L

### Comment to the results

This report replaces 6349920:1. Reason: new or corrected measurement information has been received.

#### Trygve Rönqvist (Electronically signed)

Signature Radonova Laboratories Laboratory Measurement Specialist

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK110469 [QuickScreen]	03/15/2022 07:18 AM – 03/17/2022 02:08 PM	shelf above sink, CR16	First	< 0.6 pCi/L
RK109844 [QuickScreen]	03/15/2022 07:19 AM – 03/17/2022 01:54 PM	top of shelf, RM134	First	< 0.7 pCi/L
RK109851 [QuickScreen]	03/15/2022 07:21 AM – 03/17/2022 01:56 PM	top of small shelf by entrance, Rm138	First	0.9 pCi/L
RK109661 [QuickScreen]	03/15/2022 07:22 AM – 03/17/2022 02:09 PM	shelf above microwave, CR17	First	0.7 pCi/L
RK109631 [QuickScreen]	03/15/2022 07:23 AM – 03/17/2022 02:10 PM	shelf above sink, CR18	First	< 0.5 pCi/L
RK109607 [QuickScreen]	03/15/2022 07:23 AM – 03/17/2022 02:11 PM	shelf above sink, CR19	First	< 0.8 pCi/L
RK109598 [QuickScreen]	03/15/2022 07:25 AM – 03/17/2022 02:12 PM	shelf above sink, CR21	First	< 0.6 pCi/L
RK109639 [QuickScreen]	03/15/2022 07:25 AM – 03/17/2022 02:12 PM	shelf by outside door, CR20	First	< 0.7 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK109590 [QuickScreen]	03/15/2022 07:25 AM – 03/17/2022 02:12 PM	shelf by outside door / DUP, CR20	First	< 0.8 pCi/L
RK109634 [QuickScreen]	03/15/2022 07:28 AM – 03/17/2022 02:13 PM	top of filing cabinet by desk, CR22	First	< 0.8 pCi/L
RK109641 [QuickScreen]	03/15/2022 07:31 AM – 03/17/2022 01:52 PM	top of room divider, "Library, north"	First	< 0.6 pCi/L
RK109652 [QuickScreen]	03/15/2022 07:31 AM – 03/17/2022 01:52 PM	top of room divider / DUP, "Library, north"	First	< 0.5 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK110398 [QuickScreen]	03/15/2022 07:34 AM – 03/17/2022 02:16 PM	"top of cabinet, NW corner", Maker space room C01/C02	First	< 0.6 pCi/L
RK110397 [QuickScreen]	03/15/2022 07:34 AM – 03/17/2022 02:18 PM	"top of brown bookshelf, NW corner", RM126	First	< 0.8 pCi/L
RK109605 [QuickScreen]	03/15/2022 07:37 AM – 03/17/2022 02:20 PM	"on filing cabinet, NE corner", RM125	First	0.9 pCi/L
RK109646 [QuickScreen]	03/15/2022 07:38 AM – 03/17/2022 02:20 PM	filing cabinet in NE corner, RM124	First	< 0.5 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK109567 [QuickScreen]	03/15/2022 07:38 AM – 03/17/2022 02:20 PM	filing cabinet in NE corner, RM123	First	< 0.7 pCi/L
RK109645 [QuickScreen]	03/15/2022 07:40 AM – 03/17/2022 02:22 PM	filing cabinet in NE corner, RM122	First	< 0.9 pCi/L
RK109642 [QuickScreen]	03/15/2022 07:42 AM – 03/17/2022 02:24 PM	shelf above sink, CR13	First	< 0.7 pCi/L
RK109609 [QuickScreen]	03/15/2022 07:43 AM – 03/17/2022 02:24 PM	shelf above sink, CR12	First	< 0.6 pCi/L
RK109570 [QuickScreen]	03/15/2022 07:43 AM – 03/17/2022 02:23 PM	"by paper cutter, west wall", RM114	First	< 1.0 pCi/L
RK110459 [QuickScreen]	03/15/2022 07:44 AM – 03/17/2022 02:24 PM	by red fridge, CR11	First	< 0.7 pCi/L
RK109592 [QuickScreen]	03/15/2022 07:46 AM – 03/17/2022 02:25 PM	"above sink, high on shelf", CR10	First	< 0.4 pCi/L
RK109588 [QuickScreen]	03/15/2022 07:50 AM – 03/17/2022 02:26 PM	bookshelf behind desk, CR9	First	< 0.7 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK109583 [QuickScreen]	03/15/2022 07:51 AM – 03/17/2022 02:27 PM	shelf above sink, CR8	First	< 0.6 pCi/L
RK109569 [QuickScreen]	03/15/2022 07:52 AM – 03/17/2022 02:27 PM	shelf (hidden) above sink, CR7	First	< 0.6 pCi/L
RK109618 [QuickScreen]	03/15/2022 07:53 AM – 03/17/2022 02:29 PM	top of microwave, RM108	First	< 0.7 pCi/L
RK109573 [QuickScreen]	03/15/2022 07:53 AM – 03/17/2022 02:29 PM	top of microwave / DUP, RM108	First	< 0.7 pCi/L
RK109617 [QuickScreen]	03/15/2022 07:54 AM – 03/17/2022 02:30 PM	SW corner rolling closet, CR6	First	< 0.7 pCi/L
RK109651 [QuickScreen]	03/15/2022 07:55 AM – 03/17/2022 02:30 PM	on short gray filing cabinet, RM107	First	< 0.6 pCi/L
RK109644 [QuickScreen]	03/15/2022 07:57 AM – 03/17/2022 02:31 PM	filing cabinet under globe, CR5	First	< 0.8 pCi/L
RK109636 [QuickScreen]	03/15/2022 07:58 AM – 03/17/2022 02:32 PM	top of white bookshelf on north wal, CR4	First	< 0.7 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK109628 [QuickScreen]	03/15/2022 07:59 AM – 03/17/2022 02:32 PM	top of microwave, RM106	First	< 0.8 pCi/L
RK109629 [QuickScreen]	03/15/2022 07:59 AM – 03/17/2022 02:32 PM	top of microwave / DUP, RM106	First	< 0.7 pCi/L
RK109625 [QuickScreen]	03/15/2022 08:01 AM – 03/17/2022 02:33 PM	by printer, CR3	First	< 0.6 pCi/L
RK109657 [QuickScreen]	03/15/2022 08:04 AM – 03/17/2022 02:04 PM	paper towel holder, Music room E23	First	< 0.6 pCi/L
RK109666 [QuickScreen]	03/15/2022 08:06 AM – 03/17/2022 02:02 PM	under TV cabinet, C24 auxillary room	First	< 0.6 pCi/L
RK109610 [QuickScreen]	03/15/2022 08:07 AM – 03/17/2022 02:01 PM	on top of white speaker box, "Gym, north"	First	< 0.6 pCi/L
RK109602 [QuickScreen]	03/15/2022 08:07 AM – 03/17/2022 02:01 PM	on top of white speaker box, "Gym, south"	First	< 0.7 pCi/L
RK109626 [QuickScreen]	03/15/2022 08:08 AM – 03/17/2022 02:01 PM	top of fridge, "RM161, PE office"	First	< 0.5 pCi/L

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DETECTOR	MEASUREMENT PERIOD	DESCRIPTION / LOCATION	FLOOR	RADON RESULT
RK109582 [QuickScreen]	03/15/2022 08:10 AM – 03/17/2022 01:12 PM	"Main area, paper towel holder", Kitchen	First	< 0.7 pCi/L
RK109654 [QuickScreen]	03/15/2022 08:11 AM – 03/17/2022 01:12 PM	office desk, Kitchen	First	< 0.5 pCi/L
RK109660 [QuickScreen]	03/15/2022 08:11 AM – 03/17/2022 01:12 PM	office desk /DUP, Kitchen	First	< 0.6 pCi/L
RK110365 [QuickScreen]	03/15/2022 01:15 AM – 03/17/2022 01:15 PM	BLANK, BLANK	First	< 0.8 pCi/L
RK110327 [QuickScreen]	03/15/2022 01:15 AM – 03/17/2022 01:15 PM	BLANK, BLANK	First	< 0.8 pCi/L
RK110361 [QuickScreen]	03/15/2022 01:15 AM – 03/17/2022 01:15 PM	BLANK, BLANK	First	< 0.7 pCi/L

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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  $4.0 \pm 0.5$  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.

## Codes on non-reportable detectors

<b>DNR</b>	Not Reported – Detector Not Returned
<b>ERR</b>	Not Reported – See comment

## 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 AARST and EPA 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.
- EPA Radon Measurements in Schools, EPA 402-R-92-014, July 1993.

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 EPA 402-R-95-012. 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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