May 15, 2023

Joe Crelier
Director of Risk Management
Portland Public Schools

Via email: jcrelier@pps.net

Regarding: Electronic Radon Monitor Results
Alliance High School at Meek
4039 NE Alberta Court
Portland, Oregon
PBS Project 25000.241

Mr. Crelier:

In February 2023, PBS performed short-term radon monitoring at the Meek facility at the request of Portland Public Schools. Results of short-term testing identified elevated radon in select areas. In April 2023, PBS performed follow-up testing in those areas with electronic Continuous Radon Monitors (CRMs) to determine hour-by-hour radon concentrations and provide additional information on mitigation strategies.

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 Sun Nuclear 1028 CRMs to monitor in select areas and identify the dynamics of radon concentration over time.

Testing was conducted at the end of the winter heating season and during the school week when building uses and operations were normal. Given that testing was done as heating was being reduced in the buildings, test results may not fully reflect concentrations during colder periods of time when radon tends to be the most elevated in buildings. Occupied hours were considered to be 6:00 AM to 6:00 PM and unoccupied hours were 6:00 PM to 6:00 AM.

RESULTS

The following table lists the results of radon concentrations at all tested locations.

Table 1: CRM Data Summary

Facility	Location	Test Dates	Overall Average Radon Level*	Average Radon Level During Occupied Hours*	Average Radon Level During Unoccupied Hours*	Average Identified During Feb/Mar 2023 Short-Term Testing*
Meek	Room 111	4/18-4/21	3.1	2.1	4.2	5.4
Meek	Room 113	4/18-4/21	2.7	1.9	3.5	4.1

* - units are pCi/L

Overall, concentrations were found to be lower than during initial testing. Concentrations were below the EPA action level of 4.0 pCi/L in all locations. Testing occurred in April after the end of the traditional winter heating season of October-March when radon tends to be at its highest interior concentrations. PBS found that concentrations tended to be lower during occupied hours in the tested areas, which is typically observed as building HVAC systems turn on and introduce fresh air during the day. Radon concentrations in the tested locations above are unlikely to exceed the action level again until the winter heating season resumes later in the year.

PBS recommends the District retest these areas with CRMs in the Fall of 2023, during the winter heating season which will begin after October 1, 2023, and determine mitigation requirements using information from those results.

See the attached CRM printouts for additional information on each 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. 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 503.515.7489 or james.mastanduno@pbsusa.com with any questions or comments.

Sincerely,

James Mastanduno
Project Manager

Attachment: Individual Summary Reports

Radon Inspection Report

Test Location:

Alliance High School at Meek
4039 NE Alberta Ct
Portland, OR

Bldg. Type: Educational

Test For:

Type: Pre-Mitigation

Inspected By:

PBS Engineering and Environmental

Test Result: Pass

Overall Average:	EPA Average:
3.1 pCi/l	**3.0 pCi/l**

Test Device Details:

Serial Number:	238738020
Model Number:	1028XP
Last Calibration:	10/12/2022
Next Calibration:	10/12/2023
Cal-Factors:	2.55
Motion Error:	Yes

Test Site Condition:

Test Summary:

CRM Location:	Start:	Stop:	Interval:	Duration:
Room 111	04/18/2023 06:57 AM	04/21/2023 05:57 AM	1 hr	71 hr

*First 4 hrs of data excluded	Min:	Max:	Average:	Measurement Units:
Radon Concentration:	0.0	9.8	3.0	pCi/l

Comments:

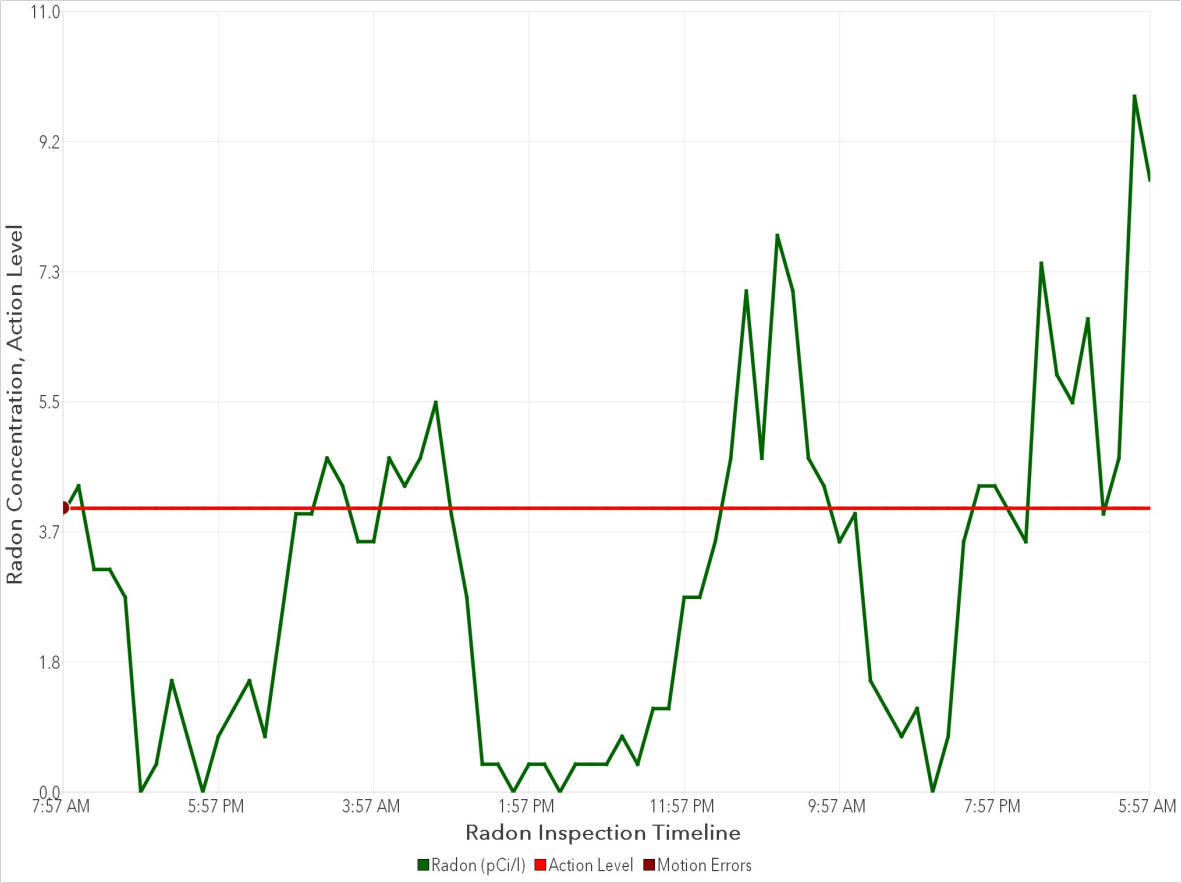
Lic/Cert Signature

Inspection Report Date: 05/02/2023

Test device manufactured by SunRADON, LLC

OneRADON™ Version 2.3.12

Radon Inspection Chart



Test Result: Pass

Test Location: 4039 NE Alberta Ct Portland, OR

Inspection Report Date: 05/02/2023

Test device manufactured by SunRADON, LLC

Test Checklist

- ☑ The location of the detector was selected so the detector was not to be disturbed during testing.
- ☑ The monitor was not placed in an area of high humidity such as: Kitchen, laundry room, cellar, spa room, garage, crawl space or sump area.
- ☑ The detector was not located near drafts caused by HVAC vents, windows and doors.
- ☑ The detector was not placed near areas of excessive heat, such as a fireplace or in direct sunlight.
- ☑ Portable window fans were removed or sealed in place prior to testing.
- ☑ The detector was placed within the breathing zone of at least 20 inches to 6 feet above the floor and at least 1 foot below the ceiling if suspended.
- ☑ The detector was not placed within 1 foot of outside walls of the home or within 3 feet of any windows or doors to the exterior of the home.
- ☑ Ceiling fans, portable dehumidifiers, portable humidifiers, portable air filters, and all window air conditioners are not operated within 20 feet of the detector.

Test Result: Pass

Test Location: 4039 NE Alberta Ct Portland, OR **Inspection Report Date:** 05/02/2023

Test device manufactured by SunRADON, LLC

Test Table

* Data from first 4 hours excluded from EPA calculations

Date/Time	Radon(pCi/l)	Flags
04/18/23 07:57 AM	3.9	M
04/18/23 08:57 AM	4.3	-
04/18/23 09:57 AM	3.1	-
04/18/23 10:57 AM	3.1	-
04/18/23 11:57 AM	2.7	-
04/18/23 12:57 PM	0.0	-
04/18/23 01:57 PM	0.4	-
04/18/23 02:57 PM	1.6	-
04/18/23 03:57 PM	0.8	-
04/18/23 04:57 PM	0.0	-
04/18/23 05:57 PM	0.8	-
04/18/23 06:57 PM	1.2	-
04/18/23 07:57 PM	1.6	-
04/18/23 08:57 PM	0.8	-
04/18/23 09:57 PM	2.4	-
04/18/23 10:57 PM	3.9	-
04/18/23 11:57 PM	3.9	-
04/19/23 12:57 AM	4.7	-
04/19/23 01:57 AM	4.3	-
04/19/23 02:57 AM	3.5	-
04/19/23 03:57 AM	3.5	-
04/19/23 04:57 AM	4.7	-
04/19/23 05:57 AM	4.3	-
04/19/23 06:57 AM	4.7	-
04/19/23 07:57 AM	5.5	-
04/19/23 08:57 AM	3.9	-
04/19/23 09:57 AM	2.7	-
04/19/23 10:57 AM	0.4	-
04/19/23 11:57 AM	0.4	-
04/19/23 12:57 PM	0.0	-
04/19/23 01:57 PM	0.4	-
04/19/23 02:57 PM	0.4	-
04/19/23 03:57 PM	0.0	-
04/19/23 04:57 PM	0.4	-
04/19/23 05:57 PM	0.4	-
04/19/23 06:57 PM	0.4	-
04/19/23 07:57 PM	0.8	-
04/19/23 08:57 PM	0.4	-
04/19/23 09:57 PM	1.2	-
04/19/23 10:57 PM	1.2	-
04/19/23 11:57 PM	2.7	-
04/20/23 12:57 AM	2.7	-
04/20/23 01:57 AM	3.5	-
04/20/23 02:57 AM	4.7	-

Test Result: Pass

Test Location: 4039 NE Alberta Ct Portland, OR **Inspection Report Date:** 05/02/2023

Test device manufactured by SunRADON, LLC

Test Table

* Data from first 4 hours excluded from EPA calculations

Date/Time	Radon(pCi/l)	Flags
04/20/23 03:57 AM	7.1	-
04/20/23 04:57 AM	4.7	-
04/20/23 05:57 AM	7.8	-
04/20/23 06:57 AM	7.1	-
04/20/23 07:57 AM	4.7	-
04/20/23 08:57 AM	4.3	-
04/20/23 09:57 AM	3.5	-
04/20/23 10:57 AM	3.9	-
04/20/23 11:57 AM	1.6	-
04/20/23 12:57 PM	1.2	-
04/20/23 01:57 PM	0.8	-
04/20/23 02:57 PM	1.2	-
04/20/23 03:57 PM	0.0	-
04/20/23 04:57 PM	0.8	-
04/20/23 05:57 PM	3.5	-
04/20/23 06:57 PM	4.3	-
04/20/23 07:57 PM	4.3	-
04/20/23 08:57 PM	3.9	-
04/20/23 09:57 PM	3.5	-
04/20/23 10:57 PM	7.5	-
04/20/23 11:57 PM	5.9	-
04/21/23 12:57 AM	5.5	-
04/21/23 01:57 AM	6.7	-
04/21/23 02:57 AM	3.9	-
04/21/23 03:57 AM	4.7	-
04/21/23 04:57 AM	9.8	-
04/21/23 05:57 AM	8.6	-

Test Result: Pass

Test Location: 4039 NE Alberta Ct Portland, OR **Inspection Report Date:** 05/02/2023

Test device manufactured by SunRADON, LLC

Radon Test Information

Understanding Radon Test Results

Recommended Action Levels vary by country and typically range from 3 pCi/l (100 Bq/m3) to 8 pCi/l (300 Bq/m3). Recommendations below are based on test results by a Continuous Radon Monitor (CRM) Test of at least 48h duration and are based on recommendations by the EPA.

Measured Average Radon Level:

- At or above 4.0 pCi/l (148 Bq/m3): Corrective measures to reduce exposure to radon gas is strongly recommended (ANSI MAH2014)
- Between 2-4 pCi/l (74-148 Bq/m3): Consider mitigation or periodic retest as indoor Radon levels vary by season and weather conditions
- Below 2 pCi/l (74 Bq/m3): Consider bi-annual retest or whenever significant changes to the home structure or mechanical systems occurred

Test Result: Pass

Test Location: 4039 NE Alberta Ct Portland, OR **Inspection Report Date:** 05/02/2023

Test device manufactured by SunRADON, LLC

Radon Inspection Report

Test Location:

Alliance High School at Meek
4039 NE Alberta Court
Portland, OR

Bldg. Type: Educational

Test For:

Type: Pre-Mitigation

Inspected By:

PBS Engineering and Environmental

Test Result: Pass

Overall Average:	EPA Average:
2.7 pCi/l	**2.7 pCi/l**

Test Device Details:

Serial Number:	245421005
Model Number:	1027
Last Calibration:	12/02/2021
Next Calibration:	12/02/2022
Correction Factor:	1.02
Motion Error:	Yes

Test Site Condition:

Test Summary:

CRM Location:	Start:	Stop:	Interval:	Duration:
Room 113	04/18/2023 06:35 AM	04/21/2023 07:35 AM	1 hr	73 hr

*First 4 hrs of data excluded	Min:	Max:	Average:	Measurement Units:
Radon Concentration:	0.0	6.7	2.7	pCi/l

Comments:

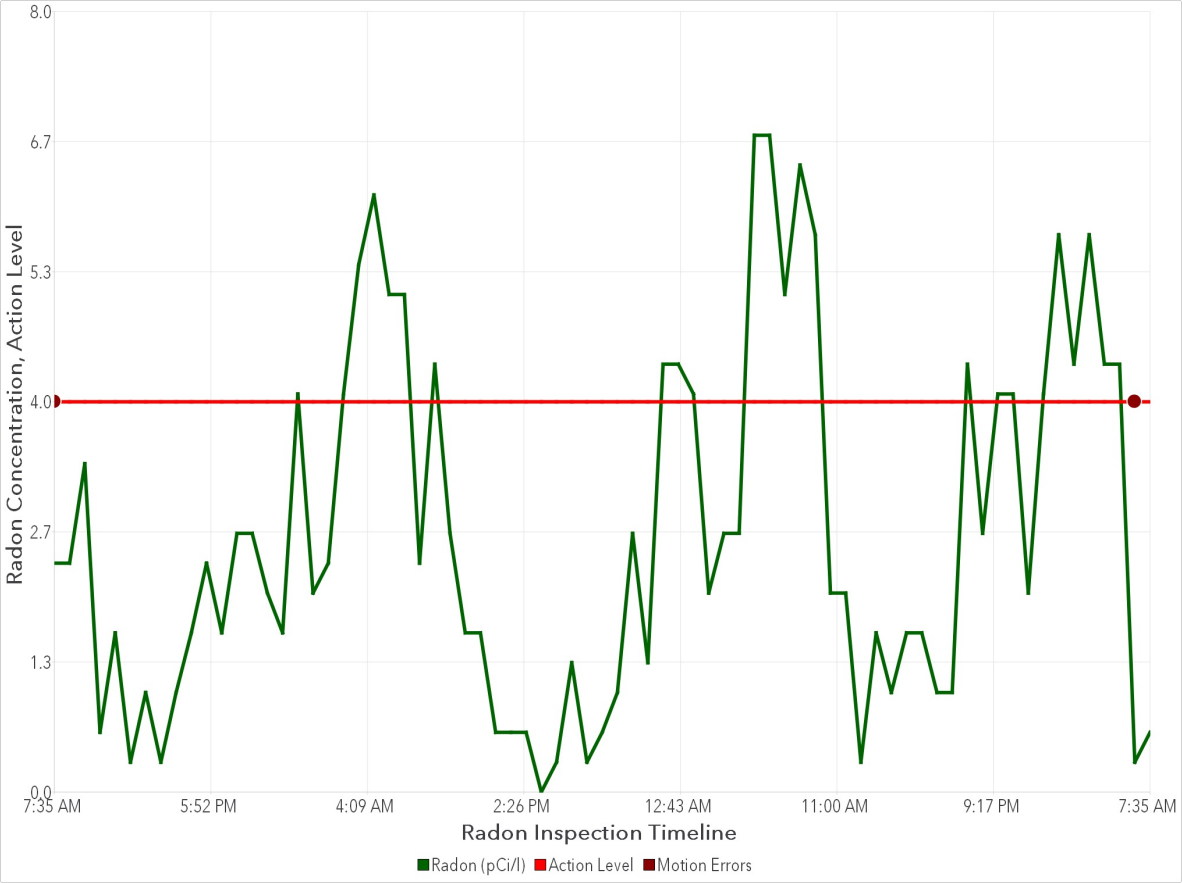
Lic/Cert Signature

Inspection Report Date: 05/09/2023

Test device manufactured by SunRADON, LLC

OneRADON™ Version 2.3.12

Radon Inspection Chart



Test Result: Pass

Test Location: 4039 NE Alberta Court Portland, OR

Inspection Report Date: 05/09/2023

Test device manufactured by SunRADON, LLC

Test Checklist

- ☑ The location of the detector was selected so the detector was not to be disturbed during testing.
- ☑ The monitor was not placed in an area of high humidity such as: Kitchen, laundry room, cellar, spa room, garage, crawl space or sump area.
- ☑ The detector was not located near drafts caused by HVAC vents, windows and doors.
- ☑ The detector was not placed near areas of excessive heat, such as a fireplace or in direct sunlight.
- ☑ Portable window fans were removed or sealed in place prior to testing.
- ☑ The detector was placed within the breathing zone of at least 20 inches to 6 feet above the floor and at least 1 foot below the ceiling if suspended.
- ☑ The detector was not placed within 1 foot of outside walls of the home or within 3 feet of any windows or doors to the exterior of the home.
- ☑ Ceiling fans, portable dehumidifiers, portable humidifiers, portable air filters, and all window air conditioners are not operated within 20 feet of the detector.

Test Result: Pass

Test Location: 4039 NE Alberta Court Portland, OR **Inspection Report Date:** 05/09/2023

Test device manufactured by SunRADON, LLC

Test Table

* Data from first 4 hours excluded from EPA calculations

Date/Time	Radon(pCi/l)	Flags
04/18/23 07:35 AM	2.3	M
04/18/23 08:35 AM	2.3	-
04/18/23 09:35 AM	3.4	-
04/18/23 10:35 AM	0.6	-
04/18/23 11:35 AM	1.6	-
04/18/23 12:35 PM	0.3	-
04/18/23 01:35 PM	1.0	-
04/18/23 02:35 PM	0.3	-
04/18/23 03:35 PM	1.0	-
04/18/23 04:35 PM	1.6	-
04/18/23 05:35 PM	2.3	-
04/18/23 06:35 PM	1.6	-
04/18/23 07:35 PM	2.7	-
04/18/23 08:35 PM	2.7	-
04/18/23 09:35 PM	2.0	-
04/18/23 10:35 PM	1.6	-
04/18/23 11:35 PM	4.1	-
04/19/23 12:35 AM	2.0	-
04/19/23 01:35 AM	2.3	-
04/19/23 02:35 AM	4.1	-
04/19/23 03:35 AM	5.4	-
04/19/23 04:35 AM	6.1	-
04/19/23 05:35 AM	5.1	-
04/19/23 06:35 AM	5.1	-
04/19/23 07:35 AM	2.3	-
04/19/23 08:35 AM	4.4	-
04/19/23 09:35 AM	2.7	-
04/19/23 10:35 AM	1.6	-
04/19/23 11:35 AM	1.6	-
04/19/23 12:35 PM	0.6	-
04/19/23 01:35 PM	0.6	-
04/19/23 02:35 PM	0.6	-
04/19/23 03:35 PM	0.0	-
04/19/23 04:35 PM	0.3	-
04/19/23 05:35 PM	1.3	-
04/19/23 06:35 PM	0.3	-
04/19/23 07:35 PM	0.6	-
04/19/23 08:35 PM	1.0	-
04/19/23 09:35 PM	2.7	-
04/19/23 10:35 PM	1.3	-
04/19/23 11:35 PM	4.4	-
04/20/23 12:35 AM	4.4	-
04/20/23 01:35 AM	4.1	-
04/20/23 02:35 AM	2.0	-

Test Result: Pass

Test Location: 4039 NE Alberta Court Portland, OR **Inspection Report Date:** 05/09/2023

Test device manufactured by SunRADON, LLC

Test Table

* Data from first 4 hours excluded from EPA calculations

Date/Time	Radon(pCi/l)	Flags
04/20/23 03:35 AM	2.7	-
04/20/23 04:35 AM	2.7	-
04/20/23 05:35 AM	6.7	-
04/20/23 06:35 AM	6.7	-
04/20/23 07:35 AM	5.1	-
04/20/23 08:35 AM	6.4	-
04/20/23 09:35 AM	5.7	-
04/20/23 10:35 AM	2.0	-
04/20/23 11:35 AM	2.0	-
04/20/23 12:35 PM	0.3	-
04/20/23 01:35 PM	1.6	-
04/20/23 02:35 PM	1.0	-
04/20/23 03:35 PM	1.6	-
04/20/23 04:35 PM	1.6	-
04/20/23 05:35 PM	1.0	-
04/20/23 06:35 PM	1.0	-
04/20/23 07:35 PM	4.4	-
04/20/23 08:35 PM	2.7	-
04/20/23 09:35 PM	4.1	-
04/20/23 10:35 PM	4.1	-
04/20/23 11:35 PM	2.0	-
04/21/23 12:35 AM	4.1	-
04/21/23 01:35 AM	5.7	-
04/21/23 02:35 AM	4.4	-
04/21/23 03:35 AM	5.7	-
04/21/23 04:35 AM	4.4	-
04/21/23 05:35 AM	4.4	-
04/21/23 06:35 AM	0.3	M
04/21/23 07:35 AM	0.6	-

Test Result: Pass

Test Location: 4039 NE Alberta Court Portland, OR **Inspection Report Date:** 05/09/2023

Test device manufactured by SunRADON, LLC

Radon Test Information

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- Between 2-4 pCi/l (74-148 Bq/m3): Consider mitigation or periodic retest as indoor Radon levels vary by season and weather conditions
- Below 2 pCi/l (74 Bq/m3): Consider bi-annual retest or whenever significant changes to the home structure or mechanical systems occurred

Test Result: Pass

Test Location: 4039 NE Alberta Court Portland, OR **Inspection Report Date:** 05/09/2023

Test device manufactured by SunRADON, LLC