



March 30, 2017

Joe Crelier
Director of Risk Management
Portland Public Schools
501 N Dixon Street
Portland, Oregon 97227

Via email: jcrelier@pps.net

Regarding: Continuous Radon Monitor Measurement Report
Ockley Green
Portland, Oregon
PBS Project No. 06500.618, Phase 0002

Dear Mr. Crelier:

From March 22, to March 27, 2017, PBS Engineering and Environmental Inc. (PBS) conducted continuous radon monitor (CRM) testing in the Ockley Green Gym. This measurement was performed in response to elevated radon levels identified during previous short-term radon monitoring and CRM radon monitoring. This test represents conditions in the gym following the installation of a temporary mitigation system and HVAC adjustments and repairs.

Testing was performed with Sun Nuclear Model 1027 continuous radon monitors, EPA- and industry-approved testing devices. The CRM monitor was placed at the north end of the bleachers in the gym at the same location as previous testing. The device was placed on the morning of March 22, 2017, and collected March 27, 2017. The devices recorded radon level and tilt (an anti-tampering indication) data for 90 hours. Closed building conditions were not verified during the course of this testing.

The following table summarizes radon data collected:

Test Location	Start Time	Stop Time	Total Time*	Average Radon Concentration (pCi/L = picocuries per liter)
Ockley Green – Gym	03/22/2017 11:33 APM	03/27/2017 01:35 PM	90 Hours	2.3 pCi/l

* Units log data once per hour for a maximum of the first 90 hours. Data for all hours between start and stop times may not be logged.

For more detail, please see the Report Graphs with Detailed Hourly Data for each test location (attached).

Joe Crelier, Director of Risk Management
Continuous Radon Monitor Measurement Report: Ockley Green Gym
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Please feel free to contact me at 503.417.7694 or chris.boyce@pbsusa.com with any questions or comments.

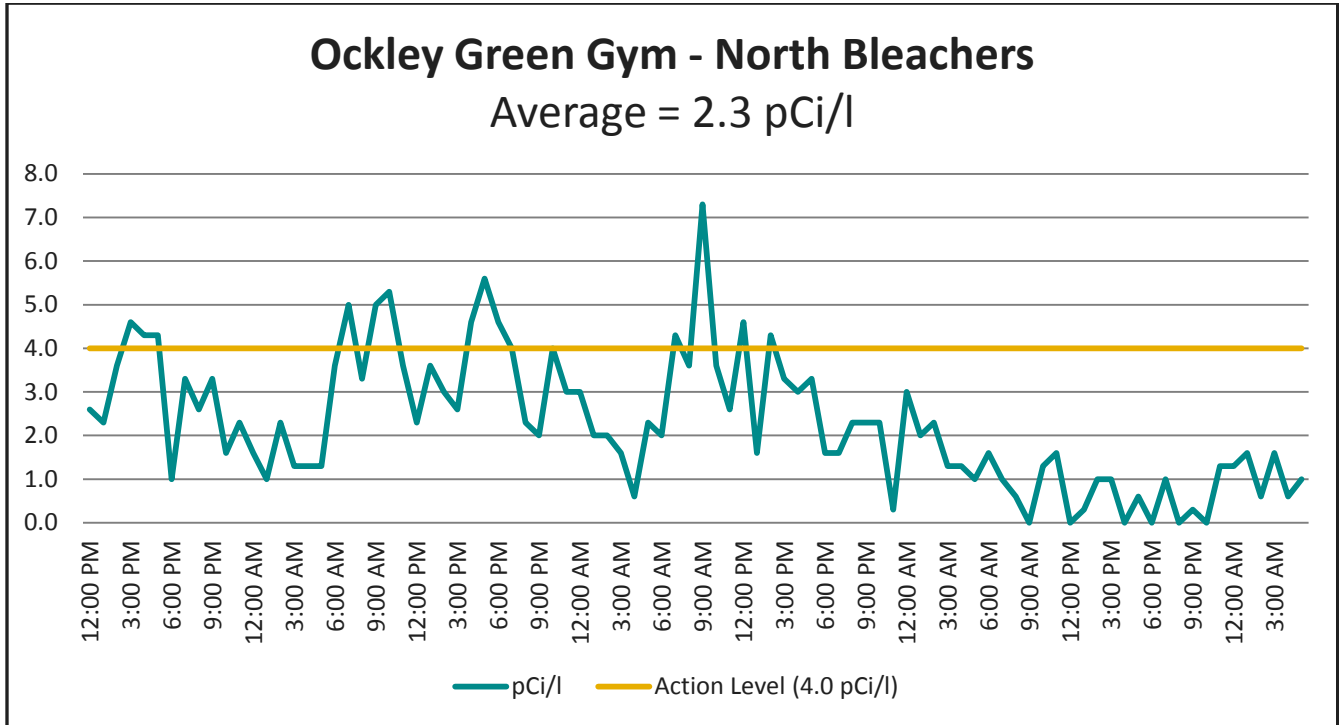
Sincerely,

A handwritten signature in black ink, appearing to read "Chris Boyce".

Chris Boyce
Project Manager

Attachments: Report Graphs with Detailed Hourly Data
CRM Statement of Calibration (Serial Number: 1407176)

Unit Type: Sun Nuclear Model 1027
 Serial Number: 1407176



Date:	Time:	Radon (pCi/l)
March 22, 2017	12:00 PM	2.6
March 22, 2017	1:00 PM	2.3
March 22, 2017	2:00 PM	3.6
March 22, 2017	3:00 PM	4.6
March 22, 2017	4:00 PM	4.3
March 22, 2017	5:00 PM	4.3
March 22, 2017	6:00 PM	1.0
March 22, 2017	7:00 PM	3.3
March 22, 2017	8:00 PM	2.6
March 22, 2017	9:00 PM	3.3
March 22, 2017	10:00 PM	1.6
March 22, 2017	11:00 PM	2.3
March 23, 2017	12:00 AM	1.6
March 23, 2017	1:00 AM	1.0
March 23, 2017	2:00 AM	2.3
March 23, 2017	3:00 AM	1.3
March 23, 2017	4:00 AM	1.3

March 23, 2017	5:00 AM	1.3
March 23, 2017	6:00 AM	3.6
March 23, 2017	7:00 AM	5.0
March 23, 2017	8:00 AM	3.3
March 23, 2017	9:00 AM	5.0
March 23, 2017	10:00 AM	5.3
March 23, 2017	11:00 AM	3.6
March 23, 2017	12:00 PM	2.3
March 23, 2017	1:00 PM	3.6
March 23, 2017	2:00 PM	3.0
March 23, 2017	3:00 PM	2.6
March 23, 2017	4:00 PM	4.6
March 23, 2017	5:00 PM	5.6
March 23, 2017	6:00 PM	4.6
March 23, 2017	7:00 PM	4.0
March 23, 2017	8:00 PM	2.3
March 23, 2017	9:00 PM	2.0
March 23, 2017	10:00 PM	4.0
March 23, 2017	11:00 PM	3.0
March 24, 2017	12:00 AM	3.0
March 24, 2017	1:00 AM	2.0
March 24, 2017	2:00 AM	2.0
March 24, 2017	3:00 AM	1.6
March 24, 2017	4:00 AM	0.6
March 24, 2017	5:00 AM	2.3
March 24, 2017	6:00 AM	2.0
March 24, 2017	7:00 AM	4.3
March 24, 2017	8:00 AM	3.6
March 24, 2017	9:00 AM	7.3
March 24, 2017	10:00 AM	3.6
March 24, 2017	11:00 AM	2.6
March 24, 2017	12:00 PM	4.6
March 24, 2017	1:00 PM	1.6
March 24, 2017	2:00 PM	4.3
March 24, 2017	3:00 PM	3.3
March 24, 2017	4:00 PM	3.0
March 24, 2017	5:00 PM	3.3
March 24, 2017	6:00 PM	1.6
March 24, 2017	7:00 PM	1.6
March 24, 2017	8:00 PM	2.3
March 24, 2017	9:00 PM	2.3

March 24, 2017	10:00 PM	2.3
March 24, 2017	11:00 PM	0.3
March 25, 2017	12:00 AM	3.0
March 25, 2017	1:00 AM	2.0
March 25, 2017	2:00 AM	2.3
March 25, 2017	3:00 AM	1.3
March 25, 2017	4:00 AM	1.3
March 25, 2017	5:00 AM	1.0
March 25, 2017	6:00 AM	1.6
March 25, 2017	7:00 AM	1.0
March 25, 2017	8:00 AM	0.6
March 25, 2017	9:00 AM	0.0
March 25, 2017	10:00 AM	1.3
March 25, 2017	11:00 AM	1.6
March 25, 2017	12:00 PM	0.0
March 25, 2017	1:00 PM	0.3
March 25, 2017	2:00 PM	1.0
March 25, 2017	3:00 PM	1.0
March 25, 2017	4:00 PM	0.0
March 25, 2017	5:00 PM	0.6
March 25, 2017	6:00 PM	0.0
March 25, 2017	7:00 PM	1.0
March 25, 2017	8:00 PM	0.0
March 25, 2017	9:00 PM	0.3
March 25, 2017	10:00 PM	0.0
March 25, 2017	11:00 PM	1.3
March 26, 2017	12:00 AM	1.3
March 26, 2017	1:00 AM	1.6
March 26, 2017	2:00 AM	0.6
March 26, 2017	3:00 AM	1.6
March 26, 2017	4:00 AM	0.6
March 26, 2017	5:00 AM	1.0



RADON REFERENCE LABORATORY

STATEMENT OF CALIBRATION



Client Information:

PBS Engineering & Environmental Inc.
4412 Southwest Corbett Avenue
Portland, Oregon 97239
Attn: Chris Boyce

BMI Control Information:

Statement No.: 17581705
Issue Date: July 25, 2016
Calibrated on: July 25, 2016
Calibrated by: JPN
Calibration site: BMI Dayton

Description of Continuous Radon Monitor:

Manufacturer: Sun Nuclear **Model:** 1027 **Serial No.:** 1407176

The monitor was found to be in good physical condition.

Initial Checks:

<u>Visual Inspection</u>	<u>Batteries</u>	<u>Power Adapter</u>	<u>High Voltage</u>	<u>Software Version</u>
Ok	Replaced	11.0 VDC (Ok)	1144 VDC (Ok)	N5A

Result of Background Exposure (16 hr): 0.1 pCi/liter

Radon Chamber Conditions:

<u>Exposure Duration</u>	<u>Radon Concentration</u>	<u>Relative Humidity</u>	<u>Temperature</u>
48 hr	25.8 ± 0.5 pCi/liter	49.9 ± 0.5 %	70.0 ± 0.1 °F

The values listed above for the radon concentration, relative humidity and temperature are the means and standard deviations of the hourly average measurements of these parameters. The calibration of Bowser-Morner's Radon Monitoring System is maintained through comparisons with the USEPA radon laboratory in Las Vegas using a NIST traceable radium standard. The estimated total uncertainty of Bowser-Morner's average chamber concentration is ± 6.4% at the 95% confidence level.

Results of Calibration:

<u>Average Monitor Reading</u>	<u>Relative Error As Received</u>	<u>Relative Error After Change of Calibration Factor</u>
28.0 pCi/liter	8.1%	-1.7%

Based on the results of the calibration, the monitor's internal calibration factor was changed to the most accurate available setting. The background value listed above should be subtracted from the radon measurement and the result multiplied by the correction factor of 1.017.

The calibration was performed using BMI procedure number 42-001.

Authorized Signature *Jill P. Newton*, Manager Radon Reference Lab

All Reports Remain The Confidential Property of Bowser-Morner and No Publication Or Distribution Of Reports May be Made Without Our Express Written Consent, Except As Authorized by Contract. Results contained in this Report are Reflective Only of the Items Calibrated or Tested.