KELSAY
Environmental Consulting

June 22, 2020

Mr. Kevin Strong
Business Manager
Sweet Home School District Office
1920 Long Street
Sweet Home, Oregon 97386

RE: Long-Term Radon Sampling at Crawfordsville Elementary School (DRAFT)

Kelsay Environmental performed a long-term radon survey at Crawfordsville Elementary School located at 38420 Glass Ave., Crawfordsville, Oregon. Sampling began on November 21, 2019 as a screening for potential Radon concerns in compliance with Oregon Revised Statute (ORS) 332.116-167. *Long-term sampling* is defined by a minimum of 90 days which helps account for normal fluctuations in building conditions over time.

Under ORS 332.166-167, radon testing in Oregon Schools must be performed by January 1st, 2021. The sampling protocol was derived from a document produced by the Oregon Health Authority called "Testing for Elevated Radon in Oregon Schools, A Protocol and Plan". The screening was performed to determine if radon levels in the building were above the Environmental Protection Agency's (EPA) action level (AL) of 4.0 pCi/L (picocuries per liter). If levels exceed the AL, a remediation process must be enacted to mitigate exposure levels. This survey would be the basis of that remediation plan.

Testing locations included every occupied room on the first floor of the structure. According to ORS 332.166-167, it specifies that "at a minimum, any frequently-occupied room in contact with the ground or located above a basement or crawlspace" should be tested.

Sampling Procedures
Kelsay Environmental conducted sampling for radon gas in all occupied rooms that were bordered by ground or soil. Crawfordsville Elementary consists of a concrete foundation with one floor. Samples were collected using Alpha Track AT-100 diffusion-based track radon monitors from Accustar Labs. A total of 8 rooms were tested (see attached table for locations). In addition, one duplicate, one spike and a blank were submitted to the lab to ensure quality control. A total of 13 detector kits were used.

Radon detectors were placed in each occupied space, particularly within the height of the normal breathing zone (between 2 and 6 feet in height) on November 21, 2019. The conditions of the building were such that the HVAC system was operating under normal occupancy conditions and the building was occupied as usual on a day-to-day basis. Samples were retrieved on March 26, 2020, providing for 128 total days of sampling, and then submitted to the Accustar Laboratory for analysis, a NELAP accredited lab, using electrochemical etching to process it's alpha track foils

503 705-0514 CCB#196361 833 SE Main St., Suite 410
bradkelsay@comcast.net Portland, Oregon 97214

which are subsequently counted with computer-aided image analysis equipment.
Samples to be spiked for quality control are sent to the Bowser-Morner Radon Reference Laboratory. Samples are exposed to specific concentrations of radon in a radon reference chamber and are then submitted to the Accustar Labs for analysis. The results are compared to the known spike concentration to ensure quality control.

Results and Discussion
Radon gas is generally always present in varying quantities, inside and outside of buildings. According to the EPA, radon gas averages 1.3 pCi/L inside buildings across the country, with 0.4 pCi/L generally considered background level. The background level is also the analytical level of detection for AccuStar Labs, levels below which cannot be accurately measured.

Laboratory results indicate that the sample in Classroom 6 is 4.1 pCi/L. This is slightly above the 4.0 pCi/L Action Level. All other samples were below the Action Level.

Spiked samples were within acceptable parameters for quality assurance based on the Relative Percentage Error (RPE). 6.1 pCi/L is the analytical result for the spikes from Bowser-Morner.

((Measured Value – Reference Value)/Reference Value) X 100%

Duplicate and blank samples were as well within acceptable parameters based on the Relative Percent Difference:

((Initial Result – Duplicate Result)/Average of Both Results) X 100%

TABLE 1
SPIKE/DUPLICATE/BLANK SAMPLE RESULTS
CRAWFORDSVILLE ELEMENTARY SCHOOL

Sample No.	Sample Variety	Location	Results (pCi/L)	Relative Percentage Error/Difference	Acceptance
4327091	Spike	NA	6.4	4.91%	Yes
4326974/ 4326896	Duplicate/Original	Classroom 7	1.8 - 1.4	25%	Yes
4327090	Blank				TBD

*Blanks should be close to 0.00 pCi/L or near the laboratory analytical level of detection
*A trend in RPE values over +/-30 pCi/L should be investigated
*RPD values of >27% should be questioned for results over 4.0 pCi/L
*RPD values of >49% should be questioned for results between 2.0-3.9 pCi/L

503 705-0514
bradkelsay@comcast.net
CCB#196361
833 SE Main St., Suite 410
Portland, Oregon 97214

Recommendations

Radon levels in Classroom 6 measured 4.1 pCi/L. The EPA recommends that follow-up testing of rooms greater than 4.0 or greater be conducted before any remediation decisions are made.

Mitigation for radon can most easily be controlled through adjustments of the heating, ventilation, and air-conditioning (HVAC) system that serves each room. Increasing the air exchange rate can help provide fresh air that effectively dilutes high radon levels to safe levels. If follow-up samples fail to indicate levels below 4.0 pCi/L, remediation is required.

Sincerely,

Lisa Janik

Lisa Janik
Industrial Hygienist

Attachments: Long-Term Radon Sampling Table
Lab Results/Chain of Custody
Exposure in Bowser-Morner Radon Chamber

503 705-0514
bradkelsay@comcast.net
CCB#196361

833 SE Main St., Suite 410
Portland, Oregon 97214

Radon Sampling Table
Crawfordsville Elementary School
38420 Glass Ave.
Crawfordsville, Oregon

DEVICE NUMBER	START DATE	STOP DATE	Total Days	LOCATION	RADON pCi/L
4326985	11/21/2019	3/27/2020	128	Main Office	1.6
4326886	11/21/2019	3/27/2020	128	Office Room	1.6
4326887	11/21/2019	3/27/2020	128	Classroom 5	2.9
4326888	11/21/2019	3/27/2020	128	Break Room	2.1
4326889	11/21/2019	3/27/2020	128	Classroom 6	4.1
4326896	11/21/2019	3/27/2020	128	Classroom 7	1.4
4326974	11/21/2019	3/27/2020	128	Classroom 7 Duplicate	1.8
4326895	11/21/2019	3/27/2020	128	Gym	2.0
4326893	11/21/2019	3/27/2020	128	Gym	2.1
4326894	11/21/2019	3/27/2020	128	Gym	2.4
4326891	11/21/2019	3/27/2020	128	Gym Fun Room (corner)	2.2
4327091	11/21/2019	3/27/2020	128	Spike	6.4
4327090				Blank	TBD

Bold - Indicates Exceeds Action Level
EPA Action Level: 4.0 pCi/L
"<": Below the level of detection

Kelsay Environmental
833 SE Main St., Suite 410
Portland, Oregon 97214

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NRPP Device Code 8205
NRSB Device Code 12001

Laboratory Report for:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Property Tested:

Crawfordsville Elementary
38420 Glass Avenue
Crawfordsville OR 97336

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673886	4326985	11/21/2019	03/27/2020	Main Office	1.6
2673887	4326886	11/21/2019	03/27/2020	Office Room	1.6
2673888	4326887	11/21/2019	03/27/2020	Classroom 5	2.9
2673889	4326888	11/21/2019	03/27/2020	Break Room	2.1
2673890	4326889	11/21/2019	03/27/2020	Class 6	4.1
2673891	4326896	11/21/2019	03/27/2020	Class 7	1.4
2673892	4326974	11/21/2019	03/27/2020	Class 7 Duplicate	1.8
2673893	4326895	11/21/2019	03/27/2020	Gym	2.0
2673894	4326893	11/21/2019	03/27/2020	Gym	2.1
2673895	4326894	11/21/2019	03/27/2020	Gym	2.4
2673896	4326891	11/21/2019	03/27/2020	Gym Fun Room Corner	2.2

Comment: Confidential: Release results to client only. Kelsay Environmental was emailed a copy of this report.

Test Performed By: Placed: Lisa Janik Retrieved: Lisa Janik

Distributed by: Kelsay Environmental

Date Received: 04/07/2020 Date Logged: 04/22/2020 Date Analyzed: 05/06/2020 Date Reported: 05/19/2020

Report Reviewed By: 

Report Approved By: 

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is ~+/- 15 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques, and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NRPP Device Code 8205
NRSB Device Code 12001

Laboratory Report for:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Property Tested:

Crawfordsville Elementary
38420 Glass Avenue
Crawfordsville OR 97336

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673897	4327091	11/21/2019	03/27/2020	Spike	6.4

Comment: Confidential: Release results to client only. Kelsay Environmental was emailed a copy of this report.

Test Performed By: Placed: Lisa Janik Retrieved: Lisa Janik

Distributed by: Kelsay Environmental

Date Received: 04/07/2020 Date Logged: 04/22/2020 Date Analyzed: 05/06/2020 Date Reported: 05/19/2020

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is ~+/- 15 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques, and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

Spike

1/2

AccuStar AccuStar Labs
2 Saber Way
Ward Hill, MA 01835
888-480-8812

Alpha Track Test Datasheet

Send Written Report To: (print clearly)

Kelsay Environmental
8338 SE Main Ste 410
Portland, OR 97214

Contact: _____ Tel: 503-995-2557

E-Mail Address: LJANIK.kes@gmail.com
BKelsay.kes

Project Number: _____

Site Name: Crawfordsville Elementary

Address: 38420 Glass Ave

City State Zip: Crawfordsville, OR 97336

Technician Name: Lisa Janik

Technician Signature: _____ (if required) Tech Certification #: _____ (if required)

Start your test before the expiration date shown on your device or your test results will be invalid.

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	**Start Date** Month/Day/Year	**Stop Date** Month/Day/Year	Lab Use
	4326985 ✓		1		Main office	11/21	3/20	
	4326886 ✓		2		office Room			
	4326887 ✓		3		CLASSroom 5			
	4326888 ✓		4		BreakRoom			
★ 4.1	*4326889* ✓		5		CLASS 6 ★			
	4326896 ✓		6		CLASS 7			
	4326974 ✓		7		CLASS 7 Duplicate			
	4326895 ✓		8		Gym			
	4326893 ✓		9		Gym			
	4326894 ✓		10		Gym			

Place up to 10 devices together with the matching datasheet in a plastic "zip lock" bag. Please see the back of this datasheet for test instructions.

Rev 180628

AccuStar Labs
2 Saber Way
Ward Hill, MA 01835
888-480-8812

2/2

Alpha Track Test Datasheet

Send Written Report To: (print clearly)

_____

_____

_____

Contact: _____ Tel: _____

E-Mail Address: _____

Project Number: _____

Site Name / Address: Crawfordsville Elementary

City State Zip: _____

Technician Name: _____

Technician Signature: _____ (If required) Tech Certification #: _____ (If required)

Start your test before the expiration date shown on your device or your test results will be invalid.

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	**Start Date** Month/Day/Year	**Stop Date** Month/Day/Year	Lab Use
	4326891 ✓		11		Gym Fun Room (corner)			
	4327091		12		SPIKE			

Place up to 10 devices together with the matching datasheet in a plastic "zip lock" bag. Please see the back of this datasheet for test instructions.

Rev 180628

AccuStar AccuStar Labs
11 Awl Street
Medway MA 02053
888-480-8812 fax 508-533-8831

Start test before expiration date on device or result will be invalid.

Radon in Air Test Data Sheet

Send Written Report To:

Kelsay Environmental

Contact: Tel:

E-Mail Address: LJANIK.KES@gmail.COM
BKELSAY.KES@gmail.COM

Project Number:

Site Name: Crawfordsville Elementary

Address: 38420 Glass Ave.

City State Zip: Crawfordsville, OR

Person Conducting Test: Lisa Janik

Start Date: **Stop Date:**

Start and Stop Times and Dates must be entered

Lab Use Only	Device Number	Building #	Unit #	Floor	Name of Room	**Start Time**	**Stop Time**	Lab Use
	4327090		13		BLANK			

Please include this data sheet with your recapped test vials. Return test devices to **AccuStar immediately.** If the test devices are not returned promptly the test may be invalid.

rev 12_28_10

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT Kelsay Environmental Job Number 194065

NOMINAL Conditions: Radon Conc 25.9 pCi/L Rel. Hum 50.1 % Temp. 70.2 F

777.9 pCi: -012

Date Start: 2/9/20 Date Stop: 3/10/20

Time Start: 0817 Time Stop: 0817

Device No.'s: (24) Alpha Tracks -
4326967, 4326968, 4327065, 4326966,
4327143, 4326953, 4327142, 4326955,
4327063, 4327061, 4327064, 4327141,
4327092, 4327093, 4327094, 4327091,
4326970, 4327095, 4326954, 4327059
MS Right 4327060, 4327062, 4326969, 4327144

Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____

Device No.'s: _____

128 Day Conversion: $30 \times 25.9 / 128 = 6.0$