

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 Sweet Home Jr. High School (DRAFT)

Kelsay Environmental performed a long-term radon survey at Sweet Home Jr. High School located at 880 22nd Ave., Sweet Home, Oregon. Sampling began on November 19, 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 of 4.0 pCi/L (picocuries per liter). If levels exceed the action level, 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. Sweet Home Jr High School 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 29 rooms were tested (see attached table for locations). In addition, 3 duplicates, one blank and one spike were submitted to the lab to ensure quality control. A total of 35 detectors kits were used. One sample placed in the Gym was lost.

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 19, 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

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 all measured radon gas concentrations were below the action level of 4.0 pCi/L.

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.

$$((\text{Measured Value} - \text{Reference Value}) / \text{Reference Value}) \times 100\%$$

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

$$((\text{Initial Result} - \text{Duplicate Result}) / \text{Average of Both Results}) \times 100\%$$

TABLE 1
SPIKE/DUPLICATE/BLANK SAMPLE RESULTS
SWEET HOME JUNIOR HIGH SCHOOL

Sample No.	Sample Variety	Location	Results (pCi/L)	Relative Percentage Error/Difference	Acceptance
4327094	Spike	NA	6.2	1.63%	Yes
4326922/ 4326923	Duplicate/Original	Room 13	1.5 – 1.4	6.89%	Yes
4327036/ 4326911	Duplicate/Original	Room 9	0.5 – 0.6	-0.18%	Yes
4326957/ 4326834	Duplicate/Original	Room 18	0.5 – 0.6	-0.18%	Yes
4327084	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

Recommendations

Radon levels throughout the structure were all below the EPA Action Level of 4.0 pCi/L and therefore remediation procedures are not required now. Oregon Health Authority (ORS 332.166-167) requires schools to re-test for radon every 10 years regardless of initial testing results or whether mitigation was done.

Sincerely,



Lisa Janik
Industrial Hygienist

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

Radon Sampling Table
Sweet Home Junior High School
880 22nd Ave.
Sweet Home, Oregon

DEVICE NUMBER	START DATE	STOP DATE	Total Days	LOCATION	RADON pCi/L
4326916	11/19/2019	3/26/2020	128	Office Area	2.2
4327077	11/19/2019	3/26/2020	128	Vice Principal's Office	1.8
4326920	11/19/2019	3/26/2020	128	Principal's Office	1.2
4326919	11/19/2019	3/26/2020	128	Health Room	1.7
4326918	11/19/2019	3/26/2020	128	Counseling	2.1
4326917	11/19/2019	3/26/2020	128	Lunch Room	1.7
4326821	11/19/2019	3/26/2020	128	Room 1	1.4
4326823	11/19/2019	3/26/2020	128	Room 2	0.5
4326824	11/19/2019	3/26/2020	128	Room 14	2.0
4326822	11/19/2019	3/26/2020	128	Room 3	0.5
4326925	11/19/2019	3/26/2020	128	Room 4	0.4
4326923	11/19/2019	3/26/2020	128	Room 13	1.4
4326922	11/19/2019	3/26/2020	128	Room 13 Duplicate	1.5
4326924	11/19/2019	3/26/2020	128	Room 12	1.3
4326825	11/19/2019	3/26/2020	128	Room 5	0.7
4327037	11/19/2019	3/26/2020	128	Room 6	0.6
4326921	11/19/2019	3/26/2020	128	Room 11	0.4
4327038	11/19/2019	3/26/2020	128	Room 10	0.4
4327039	11/19/2019	3/26/2020	128	Room 7	0.8
4327040	11/19/2019	3/26/2020	128	Room 8	<0.4
4326911	11/19/2019	3/26/2020	128	Room 9	0.9
4327036	11/19/2019	3/26/2020	128	Room 9 Duplicate	1.0
4326956	11/19/2019	3/26/2020	128	Room 17	0.7

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

Radon Sampling Table
Sweet Home Junior High School
880 22nd Ave.
Sweet Home, Oregon

DEVICE NUMBER	START DATE	STOP DATE	Total Days	LOCATION	RADON pCi/L
4326835	11/19/2019	3/26/2020	128	Room 16	1.9
4326834	11/19/2019	3/26/2020	128	Room 18	0.6
4326957	11/19/2019	3/26/2020	128	Room 18 Duplicate	0.5
4326832	11/19/2019	3/26/2020	128	Room 15	1.7
4326833	11/19/2019	3/26/2020	128	Room 19	0.9
4326831	11/19/2019	3/26/2020	128	Room 20	0.9
4326958	11/19/2019	3/26/2020	128	Library Office	3.3
4326960	11/19/2019	3/26/2020	128	Library	1.2
4326959	11/19/2019	3/26/2020	128	Gym	Not Found
4326979	11/19/2019	3/26/2020	128	Gym	1.0
4326980	11/19/2019	3/26/2020	128	Gym	1.0
4327094	11/19/2019	3/26/2020	128	Spike	6.2
4327084				Blank	TBD

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:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Sweet Home Junior High School
880 22nd Avenue
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673919	4326916	11/19/2019	03/26/2020	Office Area	2.2
2673920	4327077	11/19/2019	03/26/2020	Vice Principal Office	1.8
2673921	4326920	11/19/2019	03/26/2020	Principal Office	1.2
2673922	4326919	11/19/2019	03/26/2020	Health Room	1.7
2673923	4326918	11/19/2019	03/26/2020	Counseling	2.1
2673924	4326917	11/19/2019	03/26/2020	Lunch Room	1.7
2673925	4326821	11/19/2019	03/26/2020	Room 1	1.4
2673926	4326823	11/19/2019	03/26/2020	Room 2	0.5
2673927	4326824	11/19/2019	03/26/2020	Room 14	2.0
2673928	4326822	11/19/2019	03/26/2020	Room 3	0.5
2673929	4326925	11/19/2019	03/26/2020	Room 4	0.4

Comment: Device 4326959 listed on the COC was not received. 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: 

Disclaimer:

Shawn Price, Director of Laboratory Operations, AccuStar Labs

The uncertainty of this radon measurement is $\sim \pm 15\%$. 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.

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NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Alpha Track
NRPP Device Code 8205
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Laboratory Report for:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Sweet Home Junior High School
880 22nd Avenue
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673930	4326923	11/19/2019	03/26/2020	Room 13	1.4
2673931	4326922	11/19/2019	03/26/2020	Room 13 Duplicate	1.5
2673932	4326924	11/19/2019	03/26/2020	Room 12	1.3
2673933	4326825	11/19/2019	03/26/2020	Room 5	0.7
2673934	4327037	11/19/2019	03/26/2020	Room 6	0.6
2673935	4326921	11/19/2019	03/26/2020	Room 11	0.4
2673936	4327038	11/19/2019	03/26/2020	Room 10	0.4
2673937	4327039	11/19/2019	03/26/2020	Room 7	0.8
2673938	4327040	11/19/2019	03/26/2020	Room 8	< 0.4
2673939	4326911	11/19/2019	03/26/2020	Room 9	0.9
2673940	4327036	11/19/2019	03/26/2020	Room 9 Duplicate	1.0

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Laboratory Report for:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Sweet Home Junior High School
880 22nd Avenue
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result pCi/L
2673941	4326956	11/19/2019	03/26/2020	Room 17	0.7
2673942	4326835	11/19/2019	03/26/2020	Room 16	1.9
2673943	4326834	11/19/2019	03/26/2020	Room 18	0.6
2673944	4326957	11/19/2019	03/26/2020	Room 18 Duplicate	0.5
2673945	4326832	11/19/2019	03/26/2020	Room 15	1.7
2673946	4326833	11/19/2019	03/26/2020	Room 19	0.9
2673947	4326831	11/19/2019	03/26/2020	Room 20	0.9
2673948	4326958	11/19/2019	03/26/2020	Library Office	3.3
2673949	4326960	11/19/2019	03/26/2020	Library	1.2
2673950	4326979	11/19/2019	03/26/2020	Gym	1.0
2673951	4326980	11/19/2019	03/26/2020	Gym	1.0

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NRPP 103216 AL
NRSB ARL0017

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

Laboratory Report for:

Property Tested:

Kelsay Environmental
833 Southeast Main Street 410
Portland OR 97214

Sweet Home Junior High School
880 22nd Avenue
Sweet Home OR 97386


Log Number	Device Number	Test Exposure Duration:	Area Tested	Result pCi/L
2673952	4327094	11/19/2019 03/26/2020	Spike	6.2

Comment: Device 4326959 listed on the COC was not received. 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: 

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

Alpha Track Test Datasheet

Send Written Report To: (print clearly)

Kelsay Environmental

Contact: _____ Tel: _____

E-Mail Address: _____

Project Number: _____

Site Name

Address

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
✓	*4326916*		1		Office Area	11/19/19	3/26/20	
✓	*4327077*		2		Office: Vice Principal	11/19/19	3/26/20	
✓	*4326920*		3		Principal			
✓	*4326919*		4		Hepm Room			
✓	*4326918*		5		Counseling			
✓	*4326917*		6		Lunch Room			
✓	*4326821*		7		Room 1			
✓	*4326823*		8		Room 2			
✓	*4326824*		9		Room 14			
✓	*4326822*		10		Room 3			



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

Alpha Track Test Datasheet

Send Written Report To: (print clearly)

Project Number:

Site Name

Address

City State Zip

Technician Name:

Technician Signature:

(if required)




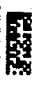






Tech Certification #:

(if required)

Contact: _____ Tel: _____

E-Mail Address: _____

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	Stop Date	Lab Use
	 *4326825*		11		Room 4	Month/Day/Year	Month/Day/Year	
	 *4326823*		12		Room 13			
	 *4326822*		13		Room 13 duplicate			
	 *4326824*		14		Room 12			
	 *4326825*		15		Room 5			
	 *4327037*		16		Room 6			
	 *4326821*		17		Room 11			
	 *4327036*		18		Room 10			
	 *4327039*		19		Room 7			
	 *4327040*		20		Room 8			

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.

3/

Alpha Track Test Datasheet

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

Send Written Report To: (print clearly)

Project Number:

Site Name

Address

City State Zip

Technician Name:

Technician Signature:

(if required)

Tech Certification #: (if required)

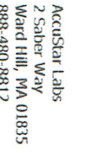
Contact: Tel:

E-Mail Address:

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
✓	*4326811*		21		Room 9			
✓	*4327036*		22		Rm 9 duplicate			
✓	*4326856*		23		Room 17			
✓	*4326835*		24		Room 16			
✓	*4326834*		25		Room 18			
✓	*4326857*		26		Room 18 duplicate			
✓	*4326832*		27		Room 15			
✓	*4326833*		28		Room 19			
✓	*4326831*		29		Room 20			
✓	*4326858*		30		Laboratory			

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.



Project Number:
Site Name
Address

Sweet Home T.H.

1

Alpha Track Test Datasheet







Contact: _____ Tel: _____
E-Mail Address: _____

Technician Name:

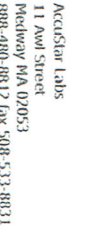
Technician Signature:

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
	✓  *4326960*		31		Library			
	 *4326959*		32		Gym			
	✓  *4326979*		33		Gym			
	✓  *4326980*		34		Gym			
		4327094	35		SPICE			
								

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.



Radon in Air Test Data Sheet

Key Switzerland

Sweet Home Junior H.S.
880 22nd Ave
Sweet Home, OR

L'Xnit. les@gmail.com

Lisa Jenik

Stop Date: PRECUT: 10/20

Start and Stop Times and Dates must be entered

[illegible]

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
777.0 pCi/L

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

Date Start: _____ Date Stop: _____

Time Start: 0817 Time Stop: 0817

Time Start: _____ Time Stop: _____

Device No.'s: (24) Alpha Tracks -

Device No.'s: _____

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

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