



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Westover Elementary School
Date of Test Report	4/29/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	37
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	2.8 pCi/L

Project Status:
Initial testing completed; no further action needed



April 29, 2022

Brian T. Croyle, PG, CHMM
Environmental Specialist
Montgomery County Public Schools
Gaithersburg, MD 20879

Re: **Radon Testing Services**
KCI Job # 122108316

Location: Westover Elementary School
401 Hawkesbury Lane
Silver Spring, MD 20904

Dear Mr. Croyle:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Westover Elementary, located at 401 Hawkesbury Lane, Silver Spring, MD 20904 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org> or www.epa.gov/radon.

KCI visited the site on March 7, 2022 and deployed forty-three (43) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, KCI also included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner prior to being returned to the laboratory for analysis.

KCI returned to the site on March 10, 2022 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a

NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

Evaluation of Testing Conditions:

These tests represent:

- Follow-up to initial testing.

These tests were conducted to:

- Evaluate radon concentration levels at the facility.

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility’s HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the mid 20s and high temperatures ranged from the high 70s to the low 50s Fahrenheit. Maximum sustained winds ranged from 0-32 miles per hour. Average humidity was around 65% with 1.09 inches of precipitation (rain) was recorded during testing period.

Results:

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	None	N/A
<4.0 pCi/L	See Attachment B	

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike Sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 891-1769.

Sincerely,



Tyler P. McCleaf
Radon Measurement Provider
#111004 RT
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-3, Radon Test Summary Spreadsheets
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Westover ES		
Test Period: 03/07/2022 - 03/10/2022		
Kit Number	Room / Area	Result
11132925	1	< 0.3
11132927	2	< 0.3
11132933	4	< 0.3
11132924	5	1.2
11132916	6	0.7
11132929	7	2.3
11132921	8	1.2
11132930	8	1.3
11132931	9	2.2
11132928	10	0.9
11132932	12	1.2
11134397	17	1.0
11132910	100	1.4
11132915	102	1.3
11132905	103	2.8
11134399	103	2.7
11132911	105	< 0.3
11132919	105	0.6
11132920	105	< 0.3
11132918	106	< 0.3
11132917	107	< 0.3
11132926	108	0.9
11132912	110	0.9
11132906	113	1.1
11132902	114	< 0.3
11132909	115	0.9
11132903	122	< 0.3
11132901	128	0.7
11134398	128	< 0.3
11132941	206	0.9
11132935	209	0.6
11132937	209	0.9
11132938	209	1.0
11132922	216	0.9
11132934	021 GYM	< 0.3
11132936	021 GYM	0.5
11132923	021A	1.4
11132908	100 CONF ROOM	1.5
11132914	100 PRINCIPAL OFFICE	1.3
11132913	102A	1.5
11132907	116A	1.1
11132904	MEDIA CENTER	0.7

Table 1- Radon Testing Results		
Westover ES		
Test Period: 03/07/2022 - 03/10/2022		
Kit Number	Room / Area	Result
11134400	MEDIA CENTER	0.8

Table 2- Radon Testing Results			
Westover ES			
Test Period: 03/07/2022 - 03/10/2022			
Kit Number	QC Type	Room / Area	Result
11132905	D	103	2.8
11132919	D	105	0.6
11132920	FB	105	< 0.3
11132921	D	8	1.2
11132937	D	209	0.9
11132935	FB	209	0.6
11131662	OB	OFFICE BLANK	< 0.3
11131691	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132925	001	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	< 0.3	2022-03-14
11132927	002	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	< 0.3	2022-03-14
11132933	004	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	< 0.3	2022-03-14
11132924	005	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	1.2 ± 0.3	2022-03-14
11132916	006	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	0.7 ± 0.3	2022-03-14
11132929	007	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	2.3 ± 0.3	2022-03-14
11132930	008	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	1.3 ± 0.3	2022-03-14
11132921	008	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	1.2 ± 0.3	2022-03-14
11132931	009	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	2.2 ± 0.4	2022-03-14
11132928	010	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	0.9 ± 0.3	2022-03-14
11132932	012	2022-03-07 @ 2:00 pm	2022-03-10 @ 12:00 pm	1.2 ± 0.3	2022-03-14
11134397	017	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	1.0 ± 0.3	2022-03-14
11132936	021 GYM	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	0.5 ± 0.3	2022-03-14
11132934	021 GYM	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	< 0.3	2022-03-14
11132923	021A	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	1.4 ± 0.3	2022-03-14
11132910	100	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	1.4 ± 0.4	2022-03-14
11132908	100 CONF ROOM	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	1.5 ± 0.3	2022-03-14
11132914	100 PRINCIPAL OFFICE	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	1.3 ± 0.3	2022-03-14
11132915	102	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	1.3 ± 0.3	2022-03-14
11132913	102A	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	1.5 ± 0.3	2022-03-14
11134399	103	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	2.7 ± 0.4	2022-03-14
11132905	103	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	2.8 ± 0.4	2022-03-14
11132911	105	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	< 0.3	2022-03-14
11132920	105	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	< 0.3	2022-03-14
11132919	105	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	0.6 ± 0.3	2022-03-14
11132918	106	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	< 0.3	2022-03-14
11132917	107	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	< 0.3	2022-03-14
11132926	108	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	0.9 ± 0.4	2022-03-14
11132912	110	2022-03-07 @ 2:00 pm	2022-03-10 @ 11:00 am	0.9 ± 0.3	2022-03-14
11132906	113	2022-03-07 @ 1:00 pm	2022-03-10 @ 12:00 pm	1.1 ± 0.3	2022-03-14
11132902	114	2022-03-07 @ 1:00 pm	2022-03-10 @ 12:00 pm	< 0.3	2022-03-14
11132909	115	2022-03-07 @ 1:00 pm	2022-03-10 @ 11:00 am	0.9 ± 0.3	2022-03-14
11132907	116A	2022-03-07 @ 1:00 pm	2022-03-10 @ 11:00 am	1.1 ± 0.3	2022-03-14
11132903	122	2022-03-07 @ 1:00 pm	2022-03-10 @ 11:00 am	< 0.3	2022-03-14
11132901	128	2022-03-07 @ 1:00 pm	2022-03-10 @ 11:00 am	0.7 ± 0.3	2022-03-14
11134398	128	2022-03-07 @ 1:00 pm	2022-03-10 @ 11:00 am	< 0.3	2022-03-14
11132941	206	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	0.9 ± 0.3	2022-03-14

March 15, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11132935	209	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	0.6 ± 0.3	2022-03-14
11132937	209	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	0.9 ± 0.3	2022-03-14
11132938	209	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	1.0 ± 0.3	2022-03-14
11132922	216	2022-03-07 @ 3:00 pm	2022-03-10 @ 12:00 pm	0.9 ± 0.3	2022-03-14
11132904	MEDIA CENTER	2022-03-07 @ 1:00 pm	2022-03-10 @ 11:00 am	0.7 ± 0.3	2022-03-14
11134400	MEDIA CENTER	2022-03-07 @ 1:00 pm	2022-03-10 @ 11:00 am	0.8 ± 0.3	2022-03-14

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204620

NOMINAL Conditions: Radon Conc 27.0 pCi/L Rel. Hum 50.1 % Temp. 70.0 F

Date Start: 3/18/22 Date Stop: 3/21/22 Date Start: _____ Date Stop: _____

Time Start: 0705 Time Stop: 0705 Time Start: _____ Time Stop: _____

Device No.'s: (5) Char Bags - Device No.'s: _____

11139367, 11139368, 11139371, _____

11139710, 11139717 _____

E3 light

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

Time Start: _____ Time Stop: _____ Time Start: _____ Time Stop: _____

Device No.'s: _____ Device No.'s: _____

Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)
Background = 7 μ R/h Elevation = 820 ft

March 30, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value (25.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139367	SK1	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.9 \pm 2.1	2022-03-30
11139368	SK2	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	23.9 \pm 2.0	2022-03-30
11139371	SK3	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	25.7 \pm 2.1	2022-03-30
11139710	SK4	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	26.4 \pm 2.1	2022-03-30
11139717	SK5	2022-03-18 @ 7:00 am	2022-03-21 @ 7:00 am	24.6 \pm 2.0	2022-03-30

Air Chek 1936 Butler Bridge Rd, Mills River, NC 28759-3892 Phone: (828) 684-0893 Fax: (828) 684-8498



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – March 2022 Schools

Name of Schools:

1. Cresthaven ES
2. Key, Francis Scott MS
3. Nix, Roscoe ES
4. Greencastle ES
5. Jackson Road
6. Page, William Tyler ES
7. West Farm Transportation Depot
8. Westover ES
9. White Oak MS

	Date	Initials
Radon Test Kits Deployed	03/07/2022	BMM
Radon Test Kits Collected	03/10/2022	BMM
Radon Test Kits Shipped to Lab*	03/10/2022	BMM
Radon Test Kits Received by Lab*	03/13/2022	BMM

*All samples sent to Air Check, Inc., 1936 Butler Bridge Rd, Mills River, NC 28759