



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Washington Grove Elementary School
Date of Test Report	4/7/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	60
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.1 pCi/L

Project Status:
Initial testing completed; no further action needed.



April 7, 2022

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

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

Location: Washington Grove ES
8712 Oakmont St.
Gaithersburg, MD 20877

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 Washington Grove ES, located at 8712 Oakmont St. Gaithersburg, MD 20877 (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 February 22, 2022 and deployed sixty nine (69) 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 February 25, 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 20s and high temperatures ranged from the high 30s to the high 40s Fahrenheit. Maximum sustained winds ranged from 5-18 miles per hour. Average humidity was around 15% with 1.5 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	NA	NA
<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		
Washington Grove ES		
Test Period: 02/22/2022 - 02/25/2022		
Kit Number	Room / Area	Result
11123366	100	< 0.3
11123371	100	0.7
11123374	100	< 0.3
11123310	101	< 0.3
11123321	101	0.6
11123319	105	1.1
11123322	112	< 0.3
11123330	113	< 0.3
11123342	115	< 0.3
11123329	116	< 0.3
11123318	118	< 0.3
11123347	118	< 0.3
11123348	118	< 0.3
11123341	119	< 0.3
11123315	124	< 0.3
11123349	125	< 0.3
11123316	126	< 0.3
11123334	127	< 0.3
11123317	129	0.6
11123323	130	0.7
11123331	134	< 0.3
11123307	136	0.7
11123308	137	0.5
11123305	138	< 0.3
11123325	139	< 0.3
11123332	139	< 0.3
11123301	140	< 0.3
11123306	141	< 0.3
11123340	142	< 0.3
11123326	143	< 0.3
11123370	144	< 0.3
11123356	152	< 0.3
11123309	153	< 0.3
11123312	153	< 0.3
11123303	157	< 0.3
11123335	157	< 0.3
11123337	157	< 0.3
11123354	159	< 0.3
11123355	162	< 0.3
11123364	163	0.9
11123313	166	< 0.3
11123357	168	0.7
11123345	171	< 0.3
11123350	172	< 0.3
11123373	173	< 0.3

Table 1- Radon Testing Results		
Washington Grove ES		
Test Period: 02/22/2022 - 02/25/2022		
Kit Number	Room / Area	Result
11123344	174	< 0.3
11123338	178	< 0.3
11123343	178	< 0.3
11123353	180	< 0.3
11123372	182	< 0.3
11123352	184	< 0.3
11123358	186	< 0.3
11123365	208	< 0.3
11123351	213	0.8
11123380	100A	< 0.3
11123381	100C	0.7
11123379	100E	< 0.3
11123367	100F	< 0.3
11123333	140C	< 0.3
11123339	140D	< 0.3
11123363	144A	< 0.3
11123302	144B	< 0.3
11123328	155B	< 0.3
11123304	APR	0.9
11123311	APR	1.1
11123314	GYM	0.8
11123324	GYM	< 0.3
11123320	KITCHEN OFFICE	< 0.3
11123327	STAGE	0.6

Table 2- Radon Testing Results			
Washington Grove ES			
Test Period: 02/22/2022 - 02/25/2022			
Kit Number	QC Type	Room / Area	Result
11123332	D	139	< 0.3
11123348	D	118	< 0.3
11123318	FB	118	< 0.3
11123321	D	101	0.6
11123335	D	157	< 0.3
11123337	FB	157	< 0.3
11123338	D	178	< 0.3
11123371	D	100	0.7
11123374	FB	100	< 0.3
11139384	OB	OFFICE BLANK	< 0.3
11131222	TB	TRAVEL BLANK	< 0.3

Summary of Missed Locations		
Washington Grove ES		
Test Period: 02/22/22 - 02/25/22		
Kit Number	Room/Area	Result
	NA	

Summary of Missing, Compromised and ≥ 4 piC/L Tests		
Washington Grove ES		
Test Period: 02/22/22 - 02/25/22		
Kit Number	Room/Area	Result
	NA	

Table Note:
 * Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:

**WASHINGTON GROVE ES
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11123366	100	2022-02-22 @ 12:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123374	100	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123371	100	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	0.7 ± 0.5	2022-03-03
11123380	100A	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123381	100C	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	0.7 ± 0.5	2022-03-03
11123379	100E	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123367	100F	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123321	101	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	0.6 ± 0.5	2022-03-03
11123310	101	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123319	105	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	1.1 ± 0.5	2022-03-03
11123322	112	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123330	113	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123342	115	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123329	116	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123348	118	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123347	118	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123318	118	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123341	119	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123315	124	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123349	125	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123316	126	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123334	127	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123317	129	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	0.6 ± 0.5	2022-03-03
11123323	130	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	0.7 ± 0.5	2022-03-03
11123331	134	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123307	136	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	0.7 ± 0.5	2022-03-03
11123308	137	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	0.5 ± 0.5	2022-03-03
11123305	138	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123332	139	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123325	139	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123301	140	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123333	140C	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123339	140D	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123306	141	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123340	142	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123326	143	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123370	144	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03

Radon test result report for:

**WASHINGTON GROVE ES
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11123363	144A	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123302	144B	2022-02-22 @ 1:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123356	152	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123312	153	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123309	153	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123328	155B	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123337	157	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123335	157	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123303	157	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123354	159	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123355	162	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123364	163	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	0.9 ± 0.5	2022-03-03
11123313	166	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123357	168	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	0.7 ± 0.5	2022-03-03
11123345	171	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123350	172	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123373	173	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123344	174	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123338	178	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123343	178	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123353	180	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123372	182	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123352	184	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123358	186	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123365	208	2022-02-22 @ 12:00 pm	2022-02-25 @ 11:00 am	< 0.3	2022-03-03
11123351	213	2022-02-22 @ 12:00 pm	2022-02-25 @ 11:00 am	0.8 ± 0.5	2022-03-03
11123304	APR	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	0.9 ± 0.5	2022-03-03
11123311	APR	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	1.1 ± 0.5	2022-03-03
11123324	GYM	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123314	GYM	2022-02-22 @ 11:00 am	2022-02-25 @ 10:00 am	0.8 ± 0.5	2022-03-03
11123320	KITCHEN OFFICE	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11123327	STAGE	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	0.6 ± 0.5	2022-03-03

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 204186

NOMINAL Conditions: Radon Conc 25.8 pCi/L Rel. Hum 50.1 % Temp. 70.9 F

Date Start: 2/18/22 Date Stop: 2/21/22 Date Start: _____ Date Stop: _____

Time Start: 0911 Time Stop: 0911 Time Start: _____ Time Stop: _____

Device No.'s: (3) Char Bags - Device No.'s: _____

11113484, 1112998, 20107126 _____

23 Right

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**

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 Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
11113484	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK1		1	27.9
11122998	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK2		1	26.0
20107126	2022-02-18	9:00 am	2022-02-21	9:00 am	71	OFFICE	MAIN	SK3		1	27.6



Radon Test Kit Chain of Custody

Project Name: MCPS Radon – February 2022 Schools

Name of Schools:

1. Dufief ES
2. Emory Grove Center
3. Fields Road ES
4. Forest Oak MS
5. Gaithersburg ES
6. Gaithersburg MS
7. Jones Lane ES
8. Rachel Carson ES
9. Rosemont ES
10. Shady Grove MS
11. Summit Hall ES
12. Washington Grove ES

	Date	Initials
Radon Test Kits Deployed	02/22/2022	PM
Radon Test Kits Collected	02/25/2022	PM
Radon Test Kits Shipped to Lab*	02/25/2022	JM
Radon Test Kits Received by Lab*	02/28/2022	PM

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