



**MCPS RADON TESTING – EXECUTIVE SUMMARY**

Site Name	Great Seneca Creek Elementary School
Date of Test Report	4/6/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	48
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.5 pCi/L

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



April 6, 2022

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

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

Location: Great Seneca Creek ES  
13010 Dairymaid Dr.  
Germantown, MD 20874

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 Great Seneca Creek ES, located at 13010 Dairymaid Dr. Germantown, MD 20874 (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](http://www.epa.gov/radon).

KCI visited the site on February 15, 2022 and deployed fifty five (55) 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 18, 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 post-mitigation biennial testing.

These tests were conducted to:

- Confirm the success of the mitigation system(s).

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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
≥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		
Great Seneca Creek ES		
Test Period: 02/15/2022 - 02/18/2022		
Kit Number	Room / Area	Result
11114214	102	0.9
11114207	106	1.5
11114208	110	0.7
11114226	111	0.6
11114250	122	0.8
11114249	124	1.2
11114246	126	0.7
11114244	128	0.5
11114251	130	0.9
11114252	133	< 0.3
11114224	135	< 0.3
11114241	135	< 0.3
11114230	137	0.5
11114222	138	0.9
11114232	141	< 0.3
11114231	142	< 0.3
11114238	144	< 0.3
11114237	151	< 0.3
11114239	155	< 0.3
11114240	157	< 0.3
11114201	161	< 0.3
11114210	161	< 0.3
11114217	165	< 0.3
11114218	169	1.2
11114220	170	< 0.3
11114221	172	< 0.3
11114219	173	1.0
11114229	175	< 0.3
11114234	176	0.8
11114235	179	0.8
11114233	181	< 0.3
11114236	181	< 0.3
11114225	184	0.7
11114253	216	< 0.3
11114248	231	< 0.3
11114255	245	< 0.3
11114254	258	< 0.3
11114202	100B	1.2
11114203	100D	1.1
11114209	100E	1.1
11114216	100K	1.3
11114212	102C	1.1



Table 1- Radon Testing Results		
Great Seneca Creek ES		
Test Period: 02/15/2022 - 02/18/2022		
Kit Number	Room / Area	Result
11114213	102D	1.2
11114228	107A	0.6
11114242	123A	1.1
11114247	123A	0.8
11114204	CAFETERIA/APR	1.4
11114211	CAFETERIA/APR	0.8
11114245	GYM	< 0.3
11114243	GYM 123	0.7
11114215	KITCHEN OFFICE	1.1
11114205	MAIN OFFICE	< 0.3
11114223	MEDIA CENTER	0.9
11114227	MEDIA CENTER	1.0
11114206	STAGE	< 0.3

Table 2- Radon Testing Results			
Great Seneca Creek ES			
Test Period: 02/15/2022 - 02/18/2022			
Kit Number	QC Type	Room / Area	Result
11114204	D	Cafeteria/APR	1.4
11114236	D	181	< 0.3
11114233	FB	181	< 0.3
11114210	D	161	< 0.3
11114241	D	135	< 0.3
11114224	FB	135	< 0.3
11114242	D	123A	1.1
11131660	OB	OFFICE BLANK	< 0.3
11131661	TB	TRAVEL BLANK	< 0.3



# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11114202	100B	2022-02-15 @ 8:00 am	2022-02-18 @ 7:00 am	1.2 ± 0.4	2022-02-22
11114203	100D	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	1.1 ± 0.4	2022-02-22
11114209	100E	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	1.1 ± 0.3	2022-02-22
11114216	100K	2022-02-15 @ 8:00 am	2022-02-18 @ 7:00 am	1.3 ± 0.4	2022-02-22
11114214	102	2022-02-15 @ 8:00 am	2022-02-18 @ 7:00 am	0.9 ± 0.4	2022-02-22
11114212	102C	2022-02-15 @ 8:00 am	2022-02-18 @ 7:00 am	1.1 ± 0.4	2022-02-22
11114213	102D	2022-02-15 @ 8:00 am	2022-02-18 @ 7:00 am	1.2 ± 0.4	2022-02-22
11114207	106	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	1.5 ± 0.4	2022-02-22
11114228	107A	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.6 ± 0.3	2022-02-22
11114208	110	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11114226	111	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.6 ± 0.3	2022-02-22
11114250	122	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.3	2022-02-22
11114247	123A	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.3	2022-02-22
11114242	123A	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.1 ± 0.4	2022-02-22
11114249	124	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.2 ± 0.4	2022-02-22
11114246	126	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11114244	128	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.5 ± 0.3	2022-02-22
11114251	130	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.9 ± 0.4	2022-02-22
11114252	133	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114241	135	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114224	135	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114230	137	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.5 ± 0.3	2022-02-22
11114222	138	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.9 ± 0.4	2022-02-22
11114232	141	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114231	142	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114238	144	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114237	151	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114239	155	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114240	157	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114210	161	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114201	161	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114217	165	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114218	169	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.2 ± 0.4	2022-02-22
11114220	170	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114221	172	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114219	173	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	1.0 ± 0.4	2022-02-22
11114229	175	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22

Radon test result report for:

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
11114234	176	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.4	2022-02-22
11114235	179	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.4	2022-02-22
11114233	181	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114236	181	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114225	184	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11114253	216	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114248	231	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114255	245	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114254	258	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114211	CAFETERIA/APR	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.8 ± 0.4	2022-02-22
11114204	CAFETERIA/APR	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	1.4 ± 0.4	2022-02-22
11114245	GYM	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22
11114243	GYM 123	2022-02-15 @ 9:00 am	2022-02-18 @ 8:00 am	0.7 ± 0.3	2022-02-22
11114215	KITCHEN OFFICE	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	1.1 ± 0.4	2022-02-22
11114205	MAIN OFFICE	2022-02-15 @ 8:00 am	2022-02-18 @ 7:00 am	< 0.3	2022-02-22
11114227	MEDIA CENTER	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	1.0 ± 0.4	2022-02-22
11114223	MEDIA CENTER	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	0.9 ± 0.4	2022-02-22
11114206	STAGE	2022-02-15 @ 8:00 am	2022-02-18 @ 8:00 am	< 0.3	2022-02-22

**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 -  
11113484, 1112998, 20107126 Device No.'s: \_\_\_\_\_

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 µR/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).

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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

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## Radon Test Kit Chain of Custody

**Project Name:** MCPS Radon – February 2022 Schools

**Name of Schools:**

1. Damascus HS
2. Germantown ES
3. Great Seneca Creek ES
4. Lake Seneca ES
5. S. Christa McAuliffe ES
6. Northwest HS
7. Waters Landing ES
8. Seneca Valley HS
9. Cedar Grove ES
10. Capt. James E. Daly ES
11. Neelsville MS
12. Dr. Sally K. Ride ES

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	Date	Initials
Radon Test Kits Deployed	02/15/2022	DM
Radon Test Kits Collected	02/18/2022	DM
Radon Test Kits Shipped to Lab*	02/18/2022	DM
Radon Test Kits Received by Lab*	02/21/2022	DM

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