



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Maryvale Elementary School
Date of Test Report	2/21/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	45
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.9 pCi/L

Project Status:

Initial testing completed; Testing completed, no further action needed



February 21, 2022

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

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

Location: Maryvale Elementary School
1010 First Street
Rockville, MD 20850

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 Maryvale Elementary School, located at 1010 First St. Rockville, MD 20850 (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 January 19, 2022 and deployed fifty two (52) 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 January 22, 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:

- Initial testing.

These tests were conducted to:

- Evaluate radon concentrations 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 50s and high temperatures ranged from the mid 40s to the low 60s Fahrenheit. Maximum sustained winds ranged from 7-15 miles per hour. Average humidity was around 50% with .15 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		
Maryvale ES		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11105705	1000	0.5
11105721	1002	1.3
11105722	1002	1.0
11106110	1004	0.9
11106109	1005	< 0.3
11106102	1009	< 0.3
11106103	1010	0.8
11106118	1010	0.9
11106115	1012	1.9
11106125	1013	< 0.3
11106124	1016	1.3
11106107	1017	0.5
11106108	1017	0.7
11106116	1020	< 0.3
11106123	1020	0.7
11106142	1022	< 0.3
11106135	1026	< 0.3
11106128	1028	< 0.3
11106137	1029	< 0.3
11106140	1033	< 0.3
11106105	1034	< 0.3
11106138	1035	0.8
11106113	1038	< 0.3
11106144	1039	0.7
11106112	1040	< 0.3
11106104	1044	< 0.3
11106121	1046	0.7
11106139	1053	< 0.3
11106141	1053	< 0.3
11106134	1057	< 0.3
11106117	1059	< 0.3
11106122	1061	< 0.3
11106106	1067	< 0.3
11106120	1067	< 0.3
11106127	1067	< 0.3
11106119	1071	< 0.3
11105727	2030	< 0.3
11105730	2030	< 0.3
11105728	2037	< 0.3
11105708	2058	< 0.3
11105709	1000A	< 0.3
11105715	1000B	< 0.3

Table 1- Radon Testing Results		
Maryvale ES		
Test Period: 01/25/2022-01/28/2022		
Kit Number	Room / Area	Result
11105710	1000E	0.5
11105719	1000G	< 0.3
11105703	1000K	< 0.3
11105711	1000N	< 0.3
11105712	1000N	< 0.3
11105713	1000N	< 0.3
11105720	1000S	0.8
11105714	1000T	< 0.3
11106114	1006C	0.8
11106136	1020A	0.9

Table 2- Radon Testing Results			
Maryvale ES			
Test Period: 12/13/2021-12/16/2021			
Kit Number	QC Type	Room / Area	Result
11106139	D	1053	< 0.3
11106127	D	1066	< 0.3
11106120	FB	1067	< 0.3
11106107	D	1017	0.5
11105712	D	1000N	< 0.3
11105711	FB	1000N	< 0.3
11105730	D	2030	< 0.3
11106126	OB	OFFICE BLANK	< 0.3
11105790	TB	TRAVEL Blank	< 0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:**MARYVALE ES****1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11105705	1000	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.5 ± 0.3	2022-01-31
11105709	1000A	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105715	1000B	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105710	1000E	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	0.5 ± 0.3	2022-01-31
11105719	1000G	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105703	1000K	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105711	1000N	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105712	1000N	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105713	1000N	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105720	1000S	2022-01-25 @ 9:00 am	2022-01-28 @ 9:00 am	0.8 ± 0.3	2022-01-31
11105714	1000T	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105721	1002	2022-01-25 @ 9:00 am	2022-01-28 @ 7:00 am	1.3 ± 0.3	2022-01-31
11105722	1002	2022-01-25 @ 9:00 am	2022-01-28 @ 7:00 am	1.0 ± 0.3	2022-01-31
11106110	1004	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.9 ± 0.3	2022-01-31
11106109	1005	2022-01-25 @ 9:00 am	2022-01-28 @ 7:00 am	< 0.3	2022-01-31
11106114	1006C	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.8 ± 0.3	2022-01-31
11106102	1009	2022-01-25 @ 9:00 am	2022-01-28 @ 7:00 am	< 0.3	2022-01-31
11106103	1010	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.8 ± 0.3	2022-01-31
11106118	1010	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.9 ± 0.3	2022-01-31
11106115	1012	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	1.9 ± 0.3	2022-01-31
11106125	1013	2022-01-25 @ 9:00 am	2022-01-28 @ 7:00 am	< 0.3	2022-01-31
11106124	1016	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	1.3 ± 0.3	2022-01-31
11106107	1017	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.5 ± 0.3	2022-01-31
11106108	1017	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.7 ± 0.3	2022-01-31
11106123	1020	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	0.7 ± 0.3	2022-01-31
11106116	1020	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106136	1020A	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	0.9 ± 0.3	2022-01-31
11106142	1022	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106135	1026	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106128	1028	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106137	1029	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106140	1033	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106105	1034	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106138	1035	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	0.8 ± 0.3	2022-01-31
11106113	1038	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106144	1039	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	0.7 ± 0.3	2022-01-31
11106112	1040	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31

Radon test result report for:**MARYVALE ES****1**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11106104	1044	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106121	1046	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	0.7 ± 0.3	2022-01-31
11106139	1053	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106141	1053	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106134	1057	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106117	1059	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106122	1061	2022-01-25 @ 8:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106106	1067	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106120	1067	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106127	1067	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11106119	1071	2022-01-25 @ 9:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105727	2030	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105730	2030	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105728	2037	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31
11105708	2058	2022-01-25 @ 10:00 am	2022-01-28 @ 8:00 am	< 0.3	2022-01-31

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies, Inc. Job Number 203404

NOMINAL Conditions: Radon Conc 16.2 pCi/L Rel. Hum 28.8 % Temp. 59.9 F

Date Start: 12/24/21 Date Stop: 12/27/21 Date Start: _____ Date Stop: _____

Time Start: 0809 Time Stop: 0809 Time Start: _____ Time Stop: _____

Device No.'s: (2) Char Bags- Device No.'s: _____

9341721, 9341722

64 left

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**

December 31, 2021

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

SK
MA MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value (16.2 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9341721	1	2021-12-24 @ 8:00 am	2021-12-27 @ 8:00 am	11.6 \pm 0.9	2021-12-31
9341722	1	2021-12-24 @ 8:00 am	2021-12-27 @ 8:00 am	15.4 \pm 1.2	2021-12-31

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 – January 2022 Schools

Name of Schools:

1. Carver Educational Center
2. College Gardens ES
3. Farmland ES
4. Julius West MS
5. Maryvale ES
6. Robert Frost MS
7. Rock Creek Forest ES
8. Sandburg Learning Center
9. Westbrook ES

	Date	Initials
Radon Test Kits Deployed	01/19/2022	DM
Radon Test Kits Collected	01/22/2022	DM
Radon Test Kits Shipped to Lab*	01/22/2022	DM
Radon Test Kits Received by Lab*	01/24/2022	DM

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