



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Shady Grove Middle 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	84
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.6 pCi/L

Project Status:

Initial testing completed; Missing or compromised samples need re-sampling



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: Shady Grove MS
8100 Midcounty Highway
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 Shady Grove MS, located at 8100 Midcounty Highway 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 ninety seven (97) 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		
Shady Grove MS		
Test Period: 02/22/2022 - 02/25/2022		
Kit Number	Room / Area	Result
11131092	A111	< 0.3
11131097	A111	0.7
11131098	A121	< 0.3
11131091	A126	< 0.3
11131090	A127	< 0.3
11131099	A130	< 0.3
11131100	A130	< 0.3
11131089	B101 DINING	< 0.3
11131094	B101 DINING	< 0.3
11131096	B110	< 0.3
11131067	B114	NA
11131068	B115	< 0.3
11131079	B120	< 0.3
11131080	B120 OFFICE	< 0.3
11131081	B120 OFFICE	0.8
11131085	B120 OFFICE	< 0.3
11131086	B124 BS	< 0.3
11131093	B130	< 0.3
11131028	C104	< 0.3
11131027	C106	1.4
11131035	C107	< 0.3
11131034	C108	1.6
11131029	C109	0.7
11131037	C110	< 0.3
11131043	C111	< 0.3
11131012	C112	0.9
11131011	C114	< 0.3
11131001	C115	0.8
11131002	C115	0.9
11131021	C115	< 0.3
11131003	C117	< 0.3
11131010	C118	< 0.3
11131015	C119	< 0.3
11131019	C121	< 0.3
11131022	C123 GUIDANCE	< 0.3
11131020	C133	< 0.3
11131016	C135	< 0.3
11131004	C136	< 0.3
11131009	C136	< 0.3
11131013	C145	< 0.3
11131014	C145	< 0.3
11131005	C146	< 0.3
11131008	C147	< 0.3
11131007	C148	< 0.3
11131006	C149	0.7

Table 1- Radon Testing Results		
Shady Grove MS		
Test Period: 02/22/2022 - 02/25/2022		
Kit Number	Room / Area	Result
11131087	C157	< 0.3
11131018	D102	< 0.3
11131025	D106	< 0.3
11131026	D106	< 0.3
11131045	D106	0.6
11131044	D108	< 0.3
11131046	D108 BUTTERFLY	< 0.3
11131051	D108 CLASSROOM	< 0.3
11131052	D108 CONFERENCE	< 0.3
11131038	D108 JAN	< 0.3
11131054	D108 MAIL	< 0.3
11131039	D108 TORY	< 0.3
11131053	D109	< 0.3
11131063	D113	< 0.3
11131062	D113A	< 0.3
11131040	D113B	< 0.3
11131047	D113C	< 0.3
11131060	D113C	< 0.3
11131061	D113C	< 0.3
11131055	D113D	< 0.3
11131070	D114	1.1
11131077	D114 FACS	< 0.3
11131069	D116	< 0.3
11131031	D119	0.8
11131032	D124	< 0.3
11131030	D127	< 0.3
11131033	D127	< 0.3
11131095	D210	0.8
11131076	D215	< 0.3
11131017	E104	< 0.3
11131074	E105	< 0.3
11131066	E106	< 0.3
11131072	E106	< 0.3
11131071	E107	< 0.3
11131065	E108	< 0.3
11131064	E109	< 0.3
11131057	E110	< 0.3
11131058	E110	< 0.3
11131059	E111	< 0.3
11131073	E115	< 0.3
11131078	E118	< 0.3
11131041	E119	< 0.3
11131024	E123	< 0.3
11131042	E124	< 0.3
11131048	E125	< 0.3

Table 1- Radon Testing Results		
Shady Grove MS		
Test Period: 02/22/2022 - 02/25/2022		
Kit Number	Room / Area	Result
11131049	E125	< 0.3
11131050	E126	< 0.3
11131056	E127	< 0.3
11131083	E205	< 0.3
11131084	E225	< 0.3
11131036	SMALL OFFICE	< 0.3
11131088	STAGE	< 0.3

Table 2- Radon Testing Results			
Shady Grove MS			
Test Period: 02/22/2022 - 02/25/2022			
Kit Number	QC Type	Room / Area	Result
11131009	D	C136	< 0.3
11131002	D	C115	0.9
11131021	FB	C115	< 0.3
11131030	D	D127	< 0.3
11131047	D	D113C	< 0.3
11131060	FB	D113C	< 0.3
11131045	D	D106	0.6
11131026	FB	D106	< 0.3
11131066	D	E106	< 0.3
11131058	FB	E110	< 0.3
11131049	D	E125	< 0.3
11131081	D	B120 Office	0.8
11131080	FB	B120 Office	< 0.3
11131092	D	A111	< 0.3
11139384	OB	OFFICE BLANK	< 0.3
11131222	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131092	A111	2022-02-22 @ 12:00 pm	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131097	A111	2022-02-22 @ 12:00 pm	2022-02-25 @ 9:00 am	0.7 ± 0.5	2022-03-03
11131098	A121	2022-02-22 @ 12:00 pm	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131091	A126	2022-02-22 @ 12:00 pm	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131090	A127	2022-02-22 @ 12:00 pm	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131100	A130	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131099	A130	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131089	B101 DINING	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131094	B101 DINING	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131096	B110	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131068	B115	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131079	B120	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131081	B120 OFFICE	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	0.8 ± 0.5	2022-03-03
11131080	B120 OFFICE	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131085	B120 OFFICE	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131086	B124 BS	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131093	B130	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131028	C104	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131027	C106	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	1.4 ± 0.6	2022-03-03
11131035	C107	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131034	C108	2022-02-22 @ 10:00 am	2022-02-25 @ 8:00 am	1.6 ± 0.5	2022-03-03
11131029	C109	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	0.7 ± 0.5	2022-03-03
11131037	C110	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131043	C111	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131012	C112	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	0.9 ± 0.5	2022-03-03
11131011	C114	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131002	C115	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	0.9 ± 0.5	2022-03-03
11131001	C115	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	0.8 ± 0.5	2022-03-03
11131021	C115	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131003	C117	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131010	C118	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131015	C119	2022-02-22 @ 9:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131019	C121	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131022	C123 GUIDANCE	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131020	C133	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131016	C135	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131009	C136	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131004	C136	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131013	C145	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131014	C145	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131005	C146	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131008	C147	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131007	C148	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131006	C149	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	0.7 ± 0.5	2022-03-03
11131087	C157	2022-02-22 @ 12:00 pm	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131018	D102	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131025	D106	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131045	D106	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	0.6 ± 0.5	2022-03-03
11131026	D106	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131044	D108	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131046	D108 BUTTERFLY	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131051	D108 CLASSROOM	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131052	D108 CONFERENCE	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131038	D108 JAN	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131054	D108 MAIL	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131039	D108 TORY	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131053	D109	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131063	D113	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131062	D113A	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131040	D113B	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131060	D113C	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131061	D113C	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131047	D113C	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131055	D113D	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131070	D114	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	1.1 ± 0.5	2022-03-03
11131077	D114 FACS	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131069	D116	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131031	D119	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	0.8 ± 0.5	2022-03-03
11131032	D124	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131030	D127	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131033	D127	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131095	D210	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	0.8 ± 0.5	2022-03-03
11131076	D215	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11131017	E104	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11131074	E105	2022-02-22 @ 10:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131072	E106	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131066	E106	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131071	E107	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131065	E108	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131064	E109	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131057	E110	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131058	E110	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131059	E111	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131073	E115	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131078	E118	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131041	E119	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131024	E123	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131042	E124	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131048	E125	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131049	E125	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131050	E126	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131056	E127	2022-02-22 @ 11:00 am	2022-02-25 @ 9:00 am	< 0.3	2022-03-03
11131083	E205	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11131084	E225	2022-02-22 @ 12:00 pm	2022-02-25 @ 10:00 am	< 0.3	2022-03-03
11131036	SMALL OFFICE	2022-02-22 @ 9:00 am	2022-02-25 @ 8:00 am	< 0.3	2022-03-03
11131088	STAGE	2022-02-22 @ 11:00 am	2022-02-25 @ 8:00 am	< 0.3	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 -
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).

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



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Shady Grove Middle School
Date of Test Report	05/27/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	2
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	<0.3 pCi/L

Project Status

Current Project Status at this time: Testing completed; no further action needed



May 27, 2022

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

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

Location: Shady Grove Middle School
8100 Midcounty Highway
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 Shady Grove Middle School, located at 8100 Midcounty Highway, 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 March 28, 2022 and deployed four (4) 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.

KCI sampled the following locations during this follow-up test:

1. Rooms with missing test kits from the Radon 2022 testing period (i.e. test kit was deployed but not recovered),
2. Rooms with invalidated test kits from the Radon 2022 testing period (e.g. an open window in the room or disturbed test kit),
3. Rooms which were locked/inaccessible during the Radon 2022 testing period,
4. Rooms with elevated radon results (i.e. ≥ 3.5 pCi/L),
5. Rooms previously tested for radon but not tested in Radon 2022, and
6. Additional rooms that require testing (if applicable.)

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 31, 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 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 mid 20°Fs and high temperatures ranged from the low 50°Fs to the mid 70°Fs. Maximum sustained winds ranged from 0-33 miles per hour. Average humidity was around 47% with 0.23 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		
Shady Grove MS RT		
Test Period: 03/28/2022 - 03/31/2022		
Kit Number	Room / Area	Result
11139962	B114	< 0.3
11139927	C137	< 0.3
11139933	C137	< 0.3
11139947	C137	< 0.3

Table 2- Radon Testing Results			
Shady Grove MS RT			
Test Period: 03/28/2022 - 03/31/2022			
Kit Number	QC Type	Room / Area	Result
11139927	D	C137	< 0.3
11139933	FB	C137	< 0.3
11139883	OB	OFFICE BLANK	< 0.3
11139841	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

April 4, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11139962	B114	2022-03-28 @ 2:00 pm	2022-03-31 @ 1:00 pm	< 0.3	2022-04-04
11139927	C137	2022-03-28 @ 2:00 pm	2022-03-31 @ 1:00 pm	< 0.3	2022-04-04
11139933	C137	2022-03-28 @ 2:00 pm	2022-03-31 @ 1:00 pm	< 0.3	2022-04-04
11139947	C137	2022-03-28 @ 2:00 pm	2022-03-31 @ 1:00 pm	< 0.3	2022-04-04

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 – Retesting

Name of Schools:

1. Rock Terrace School
2. S. Christa McAuliffe ES
3. Cedar Grove ES
4. DuFief ES
5. Emory Grove Center
6. Gaithersburg ES
7. Gaithersburg MS
8. Jones Lane ES
9. Rachel Carson ES
10. Rosemont ES
11. Shady Grove MS
12. Summit Hall ES
13. Albert Einstein HS
14. Eastern MS
15. Montgomery Blair HS
16. Newport Mill MS
17. Strawberry Knoll ES

	Date	Initials
Radon Test Kits Deployed	03/28/2022	BMM
Radon Test Kits Collected	03/31/2022	BMM
Radon Test Kits Shipped to Lab*	04/01/2022	BMM
Radon Test Kits Received by Lab*	04/04/2022	BMM

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