KCI TECHNOLOGIES

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

936 RIDGEBROOK ROAD • SPARKS, MD 21152 • 410-316-7800 • (FAX) 410-316-7935

MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Luxmanor 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	38
# Rooms ≥ 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.

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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: Luxmanor ES
6201 Tilden Lane
Rockville, MD 20852

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 Luxmanor ES, located at 6201 Tilden Lane Rockville, MD 20852 (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 7, 2022 and deployed forty four (44) 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 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:

- Initial testing.

These tests were conducted to:

- Evaluate radon centration 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 30s and high temperatures ranged from the mid 30s to the mid 50s Fahrenheit. Maximum sustained winds ranged from 3-12 miles per hour. Average humidity was around 23% with 0.1 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 piC/L	None	N/A
<4.0 piC/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 McCleaf

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
QC- Quality Control

Table 1- Radon Testing Results		
Luxmanor ES		
Test Period: 02/7/2022 - 02/10/2022		
Kit Number	Room / Area	Result
11114976	100	< 0.3
11114959	101	< 0.3
11114957	102	< 0.3
11114949	103	< 0.3
11114950	104	< 0.3
11114974	105	0.6
11114978	107	0.8
11114977	108	< 0.3
11114984	109	< 0.3
11114983	110	< 0.3
11114982	111	0.7
11114985	112	0.6
11114986	112	< 0.3
11114969	114	< 0.3
11114956	115	< 0.3
11107387	117	< 0.3
11114965	118	1.1
11114972	118	1.1
11114966	119	< 0.3
11107363	120	0.8
11114967	121	0.5
11107370	122	< 0.3
11107369	123	< 0.3
11107364	124	< 0.3
11114968	125	0.7
11114962	151	0.8
11107372	226	< 0.3
11107388	226	< 0.3
11107390	226	< 0.3
11107379	231	< 0.3
11107389	303	0.8
11114975	100A	1.0
11114980	100B	0.6
11114979	100C	0.7
11114981	100F	< 0.3
11114902	116D	< 0.3
11114961	156A	0.5
11114960	161A	< 0.3
11114963	AP	0.7
11114964	AP	< 0.3
11114970	AP	< 0.3
11114973	AP	< 0.3

Table 1- Radon Testing Results		
Luxmanor ES		
Test Period: 02/7/2022 - 02/10/2022		
Kit Number	Room / Area	Result
11114958	GYM	< 0.3
11114971	GYM	< 0.3

Table 2- Radon Testing Results			
Luxmanor ES			
Test Period: 02/7/2022 - 02/10/2022			
Kit Number	QC Type	Room / Area	Result
11114986	D	112	< 0.3
11114964	D	AP	< 0.3
11114973	FB	AP	< 0.3
11114965	D	118	1.1
11107372	D	226	< 0.3
11107388	FB	226	< 0.3
11113481	OB	OFFICE BLANK	< 0.3
11113483	TB	TRAVEL BLANK	< 0.3

Summary of Missed Locations		
Luxmanor ES		
Test Period: 02/7/22 - 02/10/22		
Kit Number	Room/Area	Result
	NA	

Summary of Missing, Compromised and >/= 4 piC/L Tests		
Luxmanor ES		
Test Period: 02/7/22 - 02/10/22		
Kit Number	Room/Area	Result
	NA	

Table Note:
* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

February 15, 2022 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
LUXMANOR ES
1

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11114976	100	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114975	100A	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	1.0 ± 0.4	2022-02-14
11114980	100B	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.6 ± 0.4	2022-02-14
11114979	100C	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.7 ± 0.3	2022-02-14
11114981	100F	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114959	101	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114957	102	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114949	103	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114950	104	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11114974	105	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.6 ± 0.3	2022-02-14
11114978	107	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.8 ± 0.4	2022-02-15
11114977	108	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114984	109	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11114983	110	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11114982	111	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.7 ± 0.4	2022-02-14
11114986	112	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114985	112	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.6 ± 0.4	2022-02-15
11114969	114	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114956	115	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114902	116D	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11107387	117	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114965	118	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	1.1 ± 0.4	2022-02-15
11114972	118	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	1.1 ± 0.4	2022-02-15
11114966	119	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11107363	120	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	0.8 ± 0.4	2022-02-15
11114967	121	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	0.5 ± 0.3	2022-02-14
11107370	122	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11107369	123	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11107364	124	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114968	125	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	0.7 ± 0.4	2022-02-15
11114962	151	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.8 ± 0.4	2022-02-14
11114961	156A	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.5 ± 0.3	2022-02-14
11114960	161A	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11107388	226	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11107372	226	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11107390	226	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11107379	231	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15

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

February 15, 2022 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
LUXMANOR ES
1

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11107389	303	2022-02-07 @ 2:00 pm	2022-02-10 @ 11:00 am	0.8 ± 0.4	2022-02-15
11114964	AP	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114973	AP	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114970	AP	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-14
11114963	AP	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	0.7 ± 0.4	2022-02-15
11114958	GYM	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15
11114971	GYM	2022-02-07 @ 1:00 pm	2022-02-10 @ 11:00 am	< 0.3	2022-02-15

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 204186

NOMINAL Conditions: Radon Conc 25.8 pCi/L Rel. Hum 59.1 % 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, 11192998, 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 ± 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

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Radon Test Kit Chain of Custody

Project Name: MCPS Radon – February 2022 Schools

Name of Schools:

1. Lincoln Center
2. Wootton HS
3. Rockville HS
4. Richard Montgomery HS
5. Rocking Horse Rd. Center
6. Blair G. Ewing Center
7. Twinbrook ES
8. Rock Creek Valley ES
9. Luxmanor ES
10. Tilden MS

	Date	Initials
Radon Test Kits Deployed	02/07/2022	
Radon Test Kits Collected	02/10/2022	
Radon Test Kits Shipped to Lab*	02/10/2022	
Radon Test Kits Received by Lab*	02/14/2022	

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