

School / Facility Radon Testing Report Form

School Year: **24-25**

Facility:	Dr. Charles R. Drew Elementary School		
Address:	1200 Swingingdale Drive		
	Silver Spring, MD 20905		
Reason for Testing:	Scheduled Re-Testing - <input checked="" type="checkbox"/> 2-year or <input type="checkbox"/> 5-year schedule <input type="checkbox"/> Clearance Testing (Post-Mitigation) <input checked="" type="checkbox"/> Building Envelope or HVAC Upgrades <input type="checkbox"/> New Construction – Addition or Facility		
Current Radon Status:	<input checked="" type="checkbox"/> Active Mitigation (2-year regular schedule) <input type="checkbox"/> No Active Mitigation (5-year regular schedule) <input type="checkbox"/> Not Previously Tested (New Facility)		
Round of Testing:	<input type="checkbox"/> Initial Testing -or- <input checked="" type="checkbox"/> Follow-up Testing		
Testing Status:	<input checked="" type="checkbox"/> No Further Testing Needed -or- <input type="checkbox"/> Follow-Up Testing Required		

Conclusion (When Testing Status is - No Further Testing Needed)

Mitigation -	Facility Radon Status:		
<input type="checkbox"/> Not Required <input checked="" type="checkbox"/> Consider (≥ 2.0 & < 4.0 -pCi/L) <input type="checkbox"/> Required (≥ 4.0 -pCi/L) Rooms:	<input checked="" type="checkbox"/> No Change in Status <input type="checkbox"/> Active Mitigation (2-year regular schedule) <input type="checkbox"/> No Active Mitigation (5-year regular schedule)		
Number of Rooms Tested	42	Lowest Value (pCi/L)	< 0.3
Number of Rooms (≥ 4.0 -pCi/L)	1	Highest Value (pCi/L)	4.3

Instructions: Submit one testing report form per-facility. Include the following as attachments:

Attachment 1- Summary Data Tables – containing the following: (see attached samples tables)

- Testing Results – lab/detector Identification, by room number/name (alpha-numeric order) as depicted on facility map/floor plan provided by the facility/school at the time of test device deployment;
- Summary Results – list of rooms by test result ≥ 2.0 -pCi/L; ≥ 2.7 -pCi/L; ≥ 4.0 -pCi/L; and ≥ 8.0 -pCi/L;
- QA/QC Results - (field blanks and duplicates) indicating location collected; trip and office blanks; and spike sample results;
- Invalid Measurement Locations – missed locations, missing and or damaged/compromised testing devices.

Attachment 2 – Laboratory Report(s)

Attachment 3 – Sampling Location Map(s) – indicating approximate location of samples, duplicates and blanks.

Detector and Deployment

Detector/Device Type:	<input checked="" type="checkbox"/> Passive	<input checked="" type="checkbox"/> Charcoal Absorption (CAD) <input type="checkbox"/> Alpha Track (ATD) <input type="checkbox"/> Other
	<input type="checkbox"/> Continuous	<input type="checkbox"/> Electret ion Chamber (EIC) <input type="checkbox"/> Electronic Integration (EID)
Other—Specify here:		
Detector/Device Name:	Air Chek – Radon Test Kits	
Manufacturer:	Radon Lab	
Person(s) Deploying or Retrieving Test Devices and certification number		Organization/Company
Brittany Maas		KCI Technologies, Inc.
Shakia Dawkins		KCI Technologies, Inc.
<i>If noncertified individuals, the qualified measurement professional providing oversight -</i>		
Tyler McCleaf, CSP – Cert. #111004-RMP		KCI Technologies, Inc.

Testing

<input checked="" type="checkbox"/> Short-Term	Length of Test (days):	3	Date of Deployment and Retrieval (mm/dd/yy):	12/03/24	03/11/25
<input type="checkbox"/> Long-Term				12/06/24	03/14/25
Does the test period include weekends, school breaks or holidays?				<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<i>If “Yes” please explain/detail in the space below:</i>					
Was HVAC operating under occupied conditions?				<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<i>If “No” please explain/detail in the space below:</i>					

Testing (continued)

Round of Testing	Detectors Deployed				
	Ground-Contact		Upper-Level(s)		Total
	Initial	Follow-Up	Initial	Follow-Up	
Test Locations ¹	39	2	2	0	43
Duplicates ²	4	1	0	0	5
Field Blanks ³	2	1	0	0	3
Grand Total					51

1 – include all detectors deployed (duplicates, field blanks); 1 detector per occupied (or intended to be occupied) ground-contact space ≤ 2,000-square feet; large spaces ≥ 2,000-square feet - 1 detector per 2,000-square feet or part thereof; and upper floors - 10% of all occupied or intended to be occupied rooms per floor (these are in addition to ground contact locations)

2 - 10% of all locations tested, per floor

3 – 5% of all locations tested, per floor

Quality Assurance / Quality Control (QA/QC)

A Quality Assurance plan that is consistent with ANSI/AARST MS-QA (Radon Measurement Systems Quality Assurance) was submitted under separate cover, and is available to review at the MCPS Radon Testing and Mitigation Program website. The following number of QA/QC samples are associated this facility.

Round of Testing	QA/QC Samples		Total
	Initial	Follow-Up	
Spikes ¹	Not applicable		10
Trip Blanks ²	1	1	2
Office Blanks ^{3, 4}	1	1	2
			14

1 - 3% of EIC detectors; and 3% from each LOT of CAD and ATD detectors; a maximum of 6-spiked measurements per month for both EIC detectors and each LOT of CAD and ATD detectors.

2 – One per shipping container from start of detector deployment

3 – One per facility tested as devices are removed/allocated from the storage location for deployment;

4 - One additional blank, analyzed prior to deployment, for storage locations that have not been evaluated or monitored, for detectors that have been stored for more than 30-day durations.

Quality Assurance / Quality Control (continued)

Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Quality Control measurements comply with QA/QC requirements in the submitted testing organization's/company's QA plan?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Round of Testing	Initial Follow-Up
All Field, Trip and Office Blanks are \leq (less than or equal to) to the Method Detection Limit?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
For all Duplicate Samples ¹ , the higher value is $\leq 2x$ the lower value?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
For all Duplicate Samples ¹ , Relative Percent Difference(s) (RPD) ² are less than the Warning Level ³ ?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
For all Duplicate Samples ¹ , Relative Percent Difference(s) (RPD) ² are less than the Control Level ³ ?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

1 – Duplicate Control – a “NO” response constitute a control failure and the space/location represented by the duplicate sample becomes an invalid measurement location and should be listed in the “Invalid Measurement Locations” Table attached to this report.

2 - The objective of duplicate tests is to assess the precision error of the measurement method or, how well two side-by-side measurements agree or disagree. Precision involving duplicates is calculated by using Relative Percent Difference (RPD). RPD is equal to the difference between the higher test result minus the lower value test result divided by the average of the two duplicate test results, multiplied by 100. The RPD result is then compared to the warning and control limits.

3 - The Warning Level is set at the deviation from ideal performance that would be expected to occur by chance only 5% of the time, and Control Limits are set at that deviation from ideal performance that would be expected to occur by chance only 1% of the time. The Warning Level indicates a potential problem, which should be investigated. The Control Level indicates that the measurement system should be subject to corrective action.

The control and warning levels for duplicates, based on the averaged duplicate test result, are -

Average concentration of the two duplicate test results	Warning Level	Control Level
< 2.0-pCi/L	1-pCi/L	Not applicable
Between 2.0 and 3.9-pCi/L	50% RPD	67% RPD
≥ 4.0 -pCi/L	28% RPD	36% RPD

Summary of Test Results¹ and Determination of Valid Measurements²

Round of Testing	Ground-Contact		Upper-Level(s)		Total
	Initial	Follow-Up	Initial	Follow-Up	
Number of test locations:	39	1	2	0	41
Number of locations ≥ 8.0 -pCi/L:	0	0	0	0	0
Number of locations ≥ 4.0 and ≤ 8 -pCi/L:	1	0	0	0	1
Number of locations ≥ 2.7 and < 4 -pCi/L:	3	0	0	0	3
Number of locations ≥ 2.0 and < 2.7 -pCi/L:	2	0	0	0	2
Number of missing required test locations ³ :	0	0	0	0	0
Number of failed duplicate control locations:	0	0	0	0	0
Percentage of missing test locations for the facility ^{4,5} :	0	0	0	0	0

1 – for locations with multiple test results, report consistent with Section 7.2(When Two Test Results Disagree) and 8.1.2 (Averaging) of ANSI/AARST MA-MFLB 2023 – Conducting Measurements of Radon in Multifamily, School, Commercial and Mix-Use Buildings;

2 - the allowance is to be calculated individually for Ground-Contact and Upper-Level(s) Test Locations;

3 – includes missed or inaccessible locations upon deployment or retrieval, damaged (not able to analyze) and missing detectors upon retrieval;

4 – if all valid measurements are < 4.0 -pCi/L and the total number of test locations are ≥ 18 , there is an allowance of $\leq 33\%$. If less than 18 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023;

5 – if any valid measurements are ≥ 4.0 -pCi/L and the total number of test locations are ≥ 20 , there is an allowance of $\leq 25\%$ of the total locations tested. If less than 20 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023.

Summary of Test Results¹ and Determination of Valid Measurements² (continued)

Round of Testing	Initial	Follow-Up
Were test devices deployed in all occupied and intended to be occupied rooms in contact with the ground, and, if applicable, 10% of upper floor rooms?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Were valid measurements obtained in all occupied and intended to be occupied rooms in contact with the ground, and, if applicable, 10% of upper floor rooms?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<i>If Yes to both above – then Testing Status – ‘No Further Testing Needed’ mark ‘NA’ below and complete Conclusions section</i>		
If No to either above, were all results obtained under 4.0-pCi/L and were sufficient valid measurements obtained?^{1,2} <i>If Yes, then - ‘No Further Testing Needed’ complete Conclusion section on first page.</i> <i>If No, then - ‘Follow-up Testing Required’ continue below.</i>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA

1 – if all valid measurements are <4.0-pCi/L and the total number of test locations are ≥18, there is an allowance of ≤33%. If less than 18 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023 – Conducting Measurements of Radon in Multifamily, School, Commercial and Mix-Use Buildings to determine the allowance;
 2 – if any valid measurements are ≥4.0-pCi/L and the total number of test locations are ≥20, there is an allowance of ≤25% of the total locations tested. If less than 20 test locations please review section 6.2 of the ANSI/AARST MA-MFLB 2023 – Conducting Measurements of Radon in Multifamily, School, Commercial and Mix-Use Buildings to determine the number the allowance.

Follow-Up Testing

Required –

- If an insufficient number (greater than the allowance provided above) of valid measurements were obtained during the initial round of testing (the “missing required test locations” in the table above);
- Any location test results ≥ 4.0-pCi/L;
- Any location where duplicates fail QC checks; and or
- At the discretion of MCPS IAQ Staff

Reason for Follow-Up Testing	Testing Procedure	Follow-up Result	Conclusion
Insufficient Number of Measurements	Follow same procedures as Initial Testing	Not Applicable	Follow Initial Testing procedures
Results ≥ 4.0-pCi/L	Deploy two Short-term follow-up tests and required blanks and duplicates; Average the results of the two tests	≥4.0	Mitigation Required
Failed QC checks		≥2.0 and <4.0	Consider Mitigation
		<2.0	Mitigation Not Required

- ***If follow-up testing identifies additional spaces requiring additional testing it will be performed as part of the ongoing follow-testing round.***

Attachment 1:

Summary Data Tables

Table 1- Radon Testing Results		
Dr. Charles R. Drew Elementary School		
Test Period: 12/03/2024 - 12/06/2024		
Kit Number	Room / Area	Result
11903936	1	< 0.3
11903941	2	0.6
11903937	3	0.7
11903938	4	1.4
11903939	5	0.7
11903934	6	< 0.3
11903927	7	1.0
11903928	7	0.7
11903929	8	0.9
11903920	9	1.1
11903919	10	0.5
11903917	11	2.0
11903931	16	0.6
11903930	21A	0.9
11903945	5A	0.6
11903906	ART	< 0.3
11903924	ASSISTANT PRINCIPAL	1.1
11903961	BUILDING SERVICE MANAGER	0.8
11903901	CONFERENCE	0.9
11903912	COU	< 0.3
11903904	GYM	4.3
11903935	GYM	< 0.3
11903954	GYM	3.4
11903955	GYM	2.8
11903946	GYM OFFICE	2.4
11903923	HEALTH ROOM	0.8
11903922	HEALTH ROOM LOBBY	1.0
11903914	HS	< 0.3
11903925	IMC	0.8
11903962	IMU	3.8
11903921	K1	0.6
11903915	K2	0.6
11903932	K2	0.7
11903907	K3	0.7
11903905	K4	0.8
11903916	MAIN OFFICE	0.9
11903911	MAKER SPACE	1.1
11903918	MAKER SPACE	< 0.3
11903926	MAKER SPACE	0.9
11903953	MPR	1.2
11903956	MPR	1.5

Table 1- Radon Testing Results		
Dr. Charles R. Drew Elementary School		
Test Period: 12/03/2024 - 12/06/2024		
Kit Number	Room / Area	Result
11903913	MU	0.6
11903940	OT/PT	0.9
11903909	PHONE ROOM	0.7
11903908	PRINCIPAL	0.9
11903948	STAGE	1.0
11903910	WORK ROOM	0.7

[illegible]

Table 3 - QC Radon Testing Results			
Dr. Charles R. Drew Elementary School			
Test Period: 12/03/2024 - 12/06/2024			
Kit Number	QC Type	Room / Area	Result
11903928	D	7	0.7
11903935	FB	GYM	< 0.3
11903954	D	GYM	3.4
11903932	D	K2	0.7
11903918	FB	MAKERS SPACE	< 0.3
11903926	D	MAKERS SPACE	0.9
11904291	OB	OFFICE BLANK	< 0.3
11904272	TB	TRAVEL BLANK	< 0.3

Table 3a - Duplicate Worksheet / Data Validation										
Dr. Charles R. Drew Elementary School										
Test Period: 12/03/2024 - 12/06/2024										
Sample ID			Duplicate Concentrations (pCi/L) and OC Checks							
Kit Numbers		Room / Area	Higher	Lower	Check #1 (Pass/Fail)	2x the Lower	Check #2 (Pass/Fail)	Average	Relative Percent Difference (RPD)	Check #3
11903915	11903932	K2	0.7	0.6	✓	1.2	PASS	0.7	<1-pCi/L	✓
11903926	11903911	Maker Space	1.1	0.9	✓	1.8	PASS	1.0	<1-pCi/L	✓
11903927	11903928	7	1.0	0.7	✓	1.4	PASS	0.9	<1-pCi/L	✓
11903955	11903954	Gym	3.4	2.8	✓	5.6	PASS	3.1	19.4%	✓
NOTES: QC Check #1 - Data Entry QC Check #2 - Higher duplicate concentration is < or = to 2x the Lower QC Check #3 - Meets RPD Limits, by average duplicate concentration - enter 2 if RPD is BELOW warning and control levels, AND passes QC Check 1 and 2 - enter 1 if RPD is ABOVE warning and BELOW control levels, AND passes QC Check 1 and 2 - enter 0 if RPD is ABOVE control level, or 'FAILS' QC Check 1 or 2							Average (pCi/L)		Warning Level	Control Level
							< 2.0		1-pCi/L	NA
							Between 2.0 and 3.9		50% RPD	67% RPD
							≥ 4.0		28% RPD	36% RPD

[illegible]

Table 1- Radon Testing Results		
Dr. Charles R. Drew Elementary School RT		
Test Period: 3/11/2025 - 3/14/2025		
Kit Number	Room / Area	Result
11892369	GYM	0.8
11892372	GYM	1.0
11892375	GYM	< 0.3
11892376	GYM	1.1

[illegible]

Table 3 - QC Radon Testing Results			
Dr. Charles R. Drew Elementary School RT			
Test Period: 3/11/2025 - 3/14/2025			
Kit Number	QC Type	Room / Area	Result
11892369	D	GYM	0.8
11892375	FB	GYM	< 0.3
11886599	OB	OFFICE BLANK	< 0.3
11886600	TB	TRAVEL BLANK	< 0.3

Table 3a - Duplicate Worksheet / Data Validation										
Dr. Charles R. Drew Elementary School RT										
Test Period: 3/11/2025 - 3/14/2025										
Sample ID			Duplicate Concentrations (pCi/L) and OC Checks							
Kit Numbers		Room / Area	Higher	Lower	Check #1 (Pass/Fail)	2x the Lower	Check #2 (Pass/Fail)	Average	Relative Percent Difference (RPD)	Check #3
11892369	11892372 11892376	GYM	1.1	0.8	✓	1.6	PASS	1.0	<1-pCi/L	✓
NOTES: QC Check #1 - Data Entry QC Check #2 - Higher duplicate concentration is < or = to 2x the Lower QC Check #3 - Meets RPD Limits, by average duplicate concentration - enter 2 if RPD is BELOW warning and control levels, AND passes QC Check 1 and 2 - enter 1 if RPD is ABOVE warning and BELOW control levels, AND passes QC Check 1 and 2 - enter 0 if RPD is ABOVE control level, or 'FAILS' QC Check 1 or 2							Average (pCi/L)		Warning Level	Control Level
							< 2.0		1-pCi/L	NA
							Between 2.0 and 3.9		50% RPD	67% RPD
							≥ 4.0		28% RPD	36% RPD

[illegible]

Attachment 2:

Laboratory Reports

Radon test result report for:**DR. CHARLES R. DREW ES
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11903936	1	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	< 0.3	2024-12-10
11903919	10	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.5 ± 0.3	2024-12-10
11903917	11	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	2.0 ± 0.4	2024-12-10
11903931	16	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.6 ± 0.4	2024-12-10
11903941	2	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.6 ± 0.4	2024-12-10
11903930	21A	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.9 ± 0.4	2024-12-10
11903937	3	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.7 ± 0.4	2024-12-10
11903938	4	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	1.4 ± 0.4	2024-12-10
11903939	5	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.7 ± 0.3	2024-12-10
11903945	5A	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.6 ± 0.4	2024-12-10
11903934	6	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	< 0.3	2024-12-10
11903927	7	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	1.0 ± 0.4	2024-12-10
11903928	7	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.7 ± 0.4	2024-12-10
11903929	8	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.9 ± 0.4	2024-12-10
11903920	9	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	1.1 ± 0.4	2024-12-10
11903906	ART	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	< 0.3	2024-12-10
11903924	ASSISTANT PRINCIPAL	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	1.1 ± 0.4	2024-12-10
11903961	BUILDING SERVICE MANAGER	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.8 ± 0.4	2024-12-10
11903901	CONFERENCE	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.9 ± 0.4	2024-12-10
11903912	COU	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	< 0.3	2024-12-10
11903954	GYM	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	3.4 ± 0.4	2024-12-10
11903955	GYM	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	2.8 ± 0.4	2024-12-10
11903904	GYM	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	4.3 ± 0.5	2024-12-10
11903935	GYM	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	< 0.3	2024-12-10
11903946	GYM OFFICE	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	2.4 ± 0.4	2024-12-10
11903923	HEALTH ROOM	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.8 ± 0.4	2024-12-10
11903922	HEALTH ROOM LOBBY	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	1.0 ± 0.4	2024-12-10
11903914	HS	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	< 0.3	2024-12-10
11903925	IMC	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.8 ± 0.4	2024-12-10
11903962	IMU	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	3.8 ± 0.4	2024-12-10
11903921	K1	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.6 ± 0.4	2024-12-10
11903915	K2	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.6 ± 0.4	2024-12-10
11903932	K2	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.7 ± 0.4	2024-12-10
11903907	K3	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.7 ± 0.3	2024-12-10
11903905	K4	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.8 ± 0.4	2024-12-10
11903916	MAIN OFFICE	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.9 ± 0.4	2024-12-10
11903911	MAKER SPACE	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	1.1 ± 0.4	2024-12-10

December 10, 2024

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
DR. CHARLES R. DREW ES
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11903918	MAKER SPACE	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	< 0.3	2024-12-10
11903926	MAKER SPACE	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.9 ± 0.4	2024-12-10
11903953	MPR	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	1.2 ± 0.4	2024-12-10
11903956	MPR	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	1.5 ± 0.4	2024-12-10
11903913	MU	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.6 ± 0.4	2024-12-10
11903940	OT/PT	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	0.9 ± 0.4	2024-12-10
11903909	PHONE ROOM	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.7 ± 0.3	2024-12-10
11903908	PRINCIPAL	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.9 ± 0.4	2024-12-10
11903948	STAGE	2024-12-03 @ 9:00 am	2024-12-06 @ 8:00 am	1.0 ± 0.4	2024-12-10
11903910	WORK ROOM	2024-12-03 @ 8:00 am	2024-12-06 @ 8:00 am	0.7 ± 0.4	2024-12-10

P4792 / TYLER MCCLEAF

Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
11892899	2024-12-02	11:00 am	2024-12-05	11:00 am	70	OFFICE	MAIN	O		1	< 0.3
11892900	2024-12-02	11:00 am	2024-12-05	11:00 am	70	TRAVEL	MAIN	T		1	< 0.3
11904003	2024-12-02	10:00 am	2024-12-05	11:00 am	70	JAMES HUBERT BLAKE HS	MAIN	SMALL GYM		1	1.4
11904272	2024-12-03	11:00 am	2024-12-06	11:00 am	70	TRAVEL	MAIN	T		1	< 0.3
11904291	2024-12-03	11:00 am	2024-12-06	11:00 am	70	OFFICE	MAIN	O		1	< 0.3

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI TECHNOLOGIES, INC Job Number 20001560

NOMINAL Conditions: Radon Conc 50.6 pCi/L Rel. Hum 50.6 % Temp. 70.8 F

Date Start: 12/14/24 Date Stop: 12/17/24 Date Start: _____ Date Stop: _____

Time Start: 0815 Time Stop: 0815 Time Start: _____ Time Stop: _____

Device No.'s: (3) CHAR BAGS Device No.'s: _____

11477880, 11477883, 11477896 _____

B4 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

December 23, 2024

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**SK
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11477880	SK1	2024-12-14 @ 8:00 am	2024-12-17 @ 8:00 am	52.0 ± 4.2	2024-12-23
11477883	SK2	2024-12-14 @ 8:00 am	2024-12-17 @ 8:00 am	54.6 ± 4.4	2024-12-23
11477896	SK3	2024-12-14 @ 8:00 am	2024-12-17 @ 8:00 am	45.5 ± 3.6	2024-12-23



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Radon Test Kit Chain of Custody

Project Name: MCPS Radon – Testing December 3rd – December 6th, 2024

Name of Schools:

- | | |
|---------------------------|---------------------------|
| 1. Cannon Road ES | 5. Albert Einstein HS |
| 2. Cloverly ES | 6. Fairland ES |
| 3. Dr. Charles R. Drew ES | 7. William H. Farquhar MS |
| 4. East Silver Spring ES | |
-

	Date	Initials
Radon Test Kits Deployed	12/03/2024	BMM
Radon Test Kits Collected	12/06/2024	BMM
Radon Test Kits Shipped to Lab*	12/06/2024	BMM
Radon Test Kits Received by Lab*	12/10/2024	BMM

*All samples sent to Air Check, Inc., 2 Saber Way, Ward Hill, MA 01835

March 17, 2025

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11892369	GYM	2025-03-11 @ 9:00 am	2025-03-14 @ 8:00 am	0.8 ± 0.3	2025-03-17
11892372	GYM	2025-03-11 @ 9:00 am	2025-03-14 @ 8:00 am	1.0 ± 0.3	2025-03-17
11892375	GYM	2025-03-11 @ 9:00 am	2025-03-14 @ 8:00 am	< 0.3	2025-03-17
11892376	GYM	2025-03-11 @ 9:00 am	2025-03-14 @ 8:00 am	1.1 ± 0.3	2025-03-17

March 17, 2025

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**OFFICE
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11892446	OB	2025-03-11 @ 11:00 am	2025-03-14 @ 11:00 am	< 0.3	2025-03-17
11886599	OB	2025-03-10 @ 11:00 am	2025-03-13 @ 11:00 am	< 0.3	2025-03-17

March 17, 2025

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**TRAVEL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11892444	TB	2025-03-11 @ 11:00 am	2025-03-14 @ 11:00 am	< 0.3	2025-03-17
11886600	TB	2025-03-10 @ 11:00 am	2025-03-13 @ 11:00 am	< 0.3	2025-03-17

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI TECHNOLOGIES, INC Job Number 20002919

NOMINAL Conditions: Radon Conc 7.0 pCi/L Rel. Hum 51.4 % Temp. 70.7 F

Date Start: 3/7/25 Date Stop: 3/10/25 Date Start: _____ Date Stop: _____

Time Start: 0832 Time Stop: 0832 Time Start: _____ Time Stop: _____

Device No.'s: (7) CHAR BAGS Device No.'s: _____

11886401 thru 11886406,

11886410

G3 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

March 19, 2025

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

QC
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11886401	SK1	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.8 ± 1.1	2025-03-19
11886405	SK2	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.1 ± 1.1	2025-03-19
11886406	SK3	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.7 ± 1.1	2025-03-19
11886403	SK4	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.9 ± 1.2	2025-03-19
11886404	SK5	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.6 ± 1.2	2025-03-19
11886410	SK6	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	7.0 ± 1.1	2025-03-19
11886402	SK7	2025-03-07 @ 9:00 am	2025-03-10 @ 9:00 am	8.6 ± 1.2	2025-03-19

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 – Re-Testing March 11th – March 14th, 2025

Name of Schools:

1. Albert Einstein HS
2. Argyle MS
3. Belmont ES
4. Benjamin Banneker MS
5. Cannon Road ES
6. Dr. Charles R. Drew ES
7. East Silver Spring ES
8. James Hubert Blake HS
9. William Farquhar MS

	Date	Initials
Radon Test Kits Deployed	3/11/2025	BMM
Radon Test Kits Collected	3/14/2025	BMM
Radon Test Kits Shipped to Lab*	3/14/2025	BMM
Radon Test Kits Received by Lab*	3/16/2025	BMM

*All samples sent to Air Check, Inc., 2 Saber Way, Ward Hill, MA 01835



MCPS RADON TESTING – EXECUTIVE SUMMARY

Site Name	Dr. Charles Drew Elementary School
Date of Test Report	4/29/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing 5 Year Testing HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	44
# Rooms ≥ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.0 pCi/L

Project Status:
Initial testing completed; no further action needed



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April 29, 2022

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

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

Location: Dr. Charles Drew Elementary School
1200 Swingingdale Dr.
Silver Spring, MD 20905

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 Dr. Charles Drew Elementary School, located at 1200 Swingingdale Dr. Silver Spring, MD 20905 (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 8, 2022 and deployed fifty (50) 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 March 11, 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 mid 20s and high temperatures ranged from the high 70s to the low 50s Fahrenheit. Maximum sustained winds ranged from 0-32 miles per hour. Average humidity was around 65% with 1.09 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		
Dr. Charles Drew ES		
Test Period: 03/08/2022 - 03/11/2022		
Kit Number	Room / Area	Result
11133841	1	< 0.3
11133873	1	< 0.3
11130480	2	< 0.3
11130499	3	< 0.3
11133846	4	< 0.3
11130481	5	< 0.3
11133845	6	< 0.3
11133811	7	< 0.3
11133805	8	< 0.3
11133850	9	< 0.3
11130493	10	< 0.3
11130462	11	1.0
11133860	16	< 0.3
11133858	21	< 0.3
11133871	5A	< 0.3
11133816	ART	0.5
11133872	BUILDING SERVICES	< 0.3
11133861	CAFETERIA OFFICE	0.7
11130460	CONFERENCE	< 0.3
11130479	COUNSELOR	< 0.3
11130416	FILE ROOM	0.7
11133868	GYM	0.7
11133869	GYM	< 0.3
11133870	GYM OFFICE	0.6
11130497	HEALTH	< 0.3
11130490	HS	< 0.3
11130487	IMC	< 0.3
11130488	IMC	< 0.3
11133812	IMC	< 0.3
11133862	IMU	0.6
11133815	K1	< 0.3
11133875	K2	< 0.3
11130492	K3	< 0.3
11130491	K4	0.6
11133863	KITCHEN	< 0.3
11133864	KITCHEN	< 0.3
11133874	KITCHEN	< 0.3
11130494	MAIN OFFICE	< 0.3
11130495	MAIN OFFICE	0.6
11130496	MAIN OFFICE	< 0.3
11133865	MPR	< 0.3
11133866	MPR	< 0.3

Table 1- Radon Testing Results		
Dr. Charles Drew ES		
Test Period: 03/08/2022 - 03/11/2022		
Kit Number	Room / Area	Result
11133867	MPR	0.6
11130489	MU	< 0.3
11130459	NURSE	< 0.3
11130498	OFFICE	0.6
11130486	PREP ROOM	< 0.3
11130500	PRINCIPAL	0.5
11133844	TV STUDIO	< 0.3
11130457	WORK ROOM	< 0.3

Table 2- Radon Testing Results			
Dr. Charles Drew ES			
Test Period: 03/08/2022 - 03/11/2022			
Kit Number	QC Type	Room / Area	Result
11130495	D	Main office	0.6
11130496	FB	Main office	< 0.3
11199414	D	IMC	< 0.3
11133841	D	1	< 0.3
11133863	D	Kitchen	< 0.3
11133864	FB	Kitchen	< 0.3
11131663	OB	OFFICE BLANK	< 0.3
11131669	TB	TRAVEL BLANK	< 0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:**DR. CHARLES DREW ES**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11133873	1	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133841	1	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133860	16	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133858	21	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133846	4	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133871	5A	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133845	6	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133811	7	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133805	8	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133850	9	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133816	ART	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	0.5 ± 0.3	2022-03-14
11133872	BUILDING SERVICES	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133861	CAFETERIA OFFICE	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	0.7 ± 0.3	2022-03-14
11133869	GYM	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133868	GYM	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	0.7 ± 0.3	2022-03-14
11133870	GYM OFFICE	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	0.6 ± 0.3	2022-03-14
11133812	IMC	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133862	IMU	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	0.6 ± 0.3	2022-03-14
11133815	K1	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133875	K2	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133864	KITCHEN	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133863	KITCHEN	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133874	KITCHEN	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133867	MPR	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	0.6 ± 0.3	2022-03-14
11133866	MPR	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133865	MPR	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11133844	TV STUDIO	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14

March 15, 2022

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

DR. CHARLES DREW ES

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
11130493	10	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130462	11	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	1.0 ± 0.3	2022-03-14
11130480	2	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130499	3	2022-03-08 @ 9:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130481	5	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130460	CONFERENCE	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130479	COUNSELOR	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130416	FILE ROOM	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	0.7 ± 0.3	2022-03-14
11130497	HEALTH	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130490	HS	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130488	IMC	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130487	IMC	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130492	K3	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130491	K4	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	0.6 ± 0.3	2022-03-14
11130495	MAIN OFFICE	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	0.6 ± 0.3	2022-03-14
11130494	MAIN OFFICE	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130496	MAIN OFFICE	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130489	MU	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130459	NURSE	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130498	OFFICE	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	0.6 ± 0.3	2022-03-14
11130486	PREP ROOM	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14
11130500	PRINCIPAL	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	0.5 ± 0.3	2022-03-14
11130457	WORK ROOM	2022-03-08 @ 8:00 am	2022-03-11 @ 12:00 pm	< 0.3	2022-03-14

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 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

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



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Corporate Office: 936 Ridgebrook road • Sparks, Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

Radon Test Kit Chain of Custody

Project Name: MCPS Radon – March 2022 Schools

Name of Schools:

1. Fairland Center
2. Cloverly ES
3. Drew, Dr. Charles ES
4. Weller Road ES
5. Wheaton HS
6. East Silver Spring ES
7. Rosemary Hills ES

	Date	Initials
Radon Test Kits Deployed	03/08/2022	BMM
Radon Test Kits Collected	03/11/2022	BMM
Radon Test Kits Shipped to Lab*	03/11/2022	BMM
Radon Test Kits Received by Lab*	03/13/2022	BMM

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



MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Dr. Charles R. Drew Elementary
Date of Report	2/3/2020
Round of Testing	Initial Follow-up Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	39
# Rooms ≥ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.1 pCi/L

Project Status

Current Project Status at this time: Testing Complete; no further action.



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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

2/3/2020

Mr. Richard Cox, MS
Environmental Team Leader
Montgomery County Public Schools
Division of Maintenance
Gaithersburg, Maryland 20879

Re: Radon Testing Services

KCI Job #12146341126

Location: Dr. Charles R. Drew Elementary

1200 Swingingdale Drive
Silver Spring, Maryland 20905

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools pursuant to completing a “short-term” 3-day radon test for the Dr. Charles R. Drew Elementary, located at 1200 Swingingdale Drive in Silver Spring, Maryland 20905 (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 Provider (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/departments/facilities/maintenance/default.aspx?id=458858> or www.epa.gov/radon.

KCI visited the site on 12/17/2019 and deployed forty-nine (49) activated charcoal (AC) radon test kits. KCI deployed radon test kits in 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 Appendix A of this report.

As a quality control measure, KCI included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted sixty (60) test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner, Inc. prior to being returned to the laboratory for analysis.

KCI returned to the site on 12/20/2019 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, Inc. is a National Radon Safety Board (NRSB) radon measurement provider and is a 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 at 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 lower-20s and high temperatures were in the lower-40s. Maximum sustained winds ranged from 12-26 miles per hour. Average humidity was around 67%. 0.54 inches of precipitation (rain and snow) was recorded during the 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	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 410-316-7800.

Sincerely,

Mr. Tyler P. McCleaf
Radon Measurement Provider
111004 RT

KCI Technologies, Inc.

Attachments:

A- Floor Plan with Test Locations

B - Tables 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 Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Table 1- Radon Testing Results		
Drew Elementary School		
Test Period: 12/17/2019-12/20/2019		
Kit Number	Room / Area	Result
9340782	WORKROOM	0.8
9340785	ASSISTANT PRINCIPAL	< 0.3
9340786	CONFERENCE	0.7
9340787	PRINCIPAL	1.1
9340788	MAIN OFFICE	< 0.3
9340789	HEALTH OFFICE	< 0.3
9340790	HEALTH	< 0.3
9340791	HEALTH	0.7
9340792	ASSISTANT PRINCIPAL	0.7
9340793	K1	< 0.3
9340794	K2	< 0.3
9340795	K3	0.6
9340796	ART	0.6
9340797	ART	< 0.3
9340798	K4	1
9340799	HS	< 0.3
9340800	MU	< 0.3
9340901	5	< 0.3
9340902	5	0.6
9340904	9	< 0.3
9340905	COU	0.8
9340906	8	0.8
9340907	8	0.6
9340908	PREPARATION CENTER	0.9
9340909	11	0.8
9340910	10	0.8
9340912	OPT/PT/APE	0.9
9340913	5A	0.8
9340914	2	0.8
9340915	6	0.5
9340916	6	< 0.3
9340917	4	0.7
9340918	3	< 0.3
9340919	GYM	1
9340920	GYM	1.1
9340921	1	< 0.3
9340922	7	0.6
9340923	GYM OFFICE	1
9340924	BUILDING SERVICES OFFICE	0.8
9340925	MPR	0.6
9340926	MPR	0.9
9340927	STAGE	0.9
9340928	STAGE	< 0.3
9340929	IMU	0.7
9340930	16	0.6
9340931	21	< 0.3
9340932	26	< 0.3
9340933	26	< 0.3
9340934	17	0.6
9340903	IMC	0.8

9340911	IMC	1
9341393	OFFICE BLANK	< 0.3

Table 2- Radon Testing Results			
Drew Elementary School			
Test Period: 12/16/2019-12/19/2019			
Kit Number	QC Type	Room / Area	Result
9340792	D	ASSISTANT PRINCIPAL	0.7
9340790	FB	HEALTH	<0.3
9340796	D	ART	0.6
9340906	D	8	0.8
9340901	FB	5	<0.3
9340915	D	6	0.5
9340928	D	STAGE	<0.3
9340933	FB	26	<0.3
9341377	TRANSIT BLANK	NA	0.5
9341379	TRANSIT BLANK	NA	< 0.3
9341380	TRANSIT BLANK	NA	< 0.3
9341398	TRANSIT BLANK	NA	< 0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:**DREW ES
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340921	1	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	< 0.3	2019-12-24
9340910	10	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.8 ± 0.4	2019-12-24
9340909	11	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.8 ± 0.4	2019-12-24
9340930	16	2019-12-17 @ 12:00 pm	2019-12-20 @ 12:00 pm	0.6 ± 0.4	2019-12-24
9340934	17	2019-12-17 @ 12:00 pm	2019-12-20 @ 12:00 pm	0.6 ± 0.4	2019-12-24
9340914	2	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.8 ± 0.4	2019-12-24
9340931	21	2019-12-17 @ 12:00 pm	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340933	26	2019-12-17 @ 12:00 pm	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340932	26	2019-12-17 @ 12:00 pm	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340918	3	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340917	4	2019-12-17 @ 12:00 pm	2019-12-20 @ 12:00 pm	0.7 ± 0.3	2019-12-24
9340902	5	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.6 ± 0.4	2019-12-24
9340901	5	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340913	5A	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.8 ± 0.4	2019-12-24
9340916	6	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	< 0.3	2019-12-24
9340915	6	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.5 ± 0.4	2019-12-24
9340922	7	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.6 ± 0.4	2019-12-24
9340906	8	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.8 ± 0.4	2019-12-24
9340907	8	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.6 ± 0.4	2019-12-24
9340904	9	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340797	ART	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340796	ART	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.6 ± 0.4	2019-12-24
9340792	ASSISTANT PRINCIPAL	2019-12-17 @ 10:00 am	2019-12-20 @ 11:00 am	0.7 ± 0.4	2019-12-24
9340785	ASSISTANT PRINCIPAL	2019-12-17 @ 10:00 am	2019-12-20 @ 11:00 am	< 0.3	2019-12-24
9340924	BUILDING SERVICES OFFICE	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.8 ± 0.4	2019-12-24
9340786	CONFERENCE	2019-12-17 @ 10:00 am	2019-12-20 @ 11:00 am	0.7 ± 0.4	2019-12-24
9340905	COU	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.8 ± 0.4	2019-12-24
9340919	GYM	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	1.0 ± 0.4	2019-12-24
9340920	GYM	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	1.1 ± 0.4	2019-12-24
9340923	GYM OFFICE	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	1.0 ± 0.4	2019-12-24
9340790	HEALTH	2019-12-17 @ 11:00 am	2019-12-20 @ 11:00 am	< 0.3	2019-12-24
9340791	HEALTH	2019-12-17 @ 11:00 am	2019-12-20 @ 11:00 am	0.7 ± 0.4	2019-12-24
9340789	HEALTH OFFICE	2019-12-17 @ 11:00 am	2019-12-20 @ 11:00 am	< 0.3	2019-12-24
9340799	HS	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340929	IMU	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.7 ± 0.4	2019-12-24
9340793	K1	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340794	K2	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24

December 24, 2019

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

DREW ES

MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340795	K3	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.6 ± 0.3	2019-12-24
9340798	K4	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	1.0 ± 0.4	2019-12-24
9340788	MAIN OFFICE	2019-12-17 @ 10:00 am	2019-12-20 @ 11:00 am	< 0.3	2019-12-24
9340926	MPR	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.9 ± 0.4	2019-12-24
9340925	MPR	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.6 ± 0.4	2019-12-24
9340800	MU	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	< 0.3	2019-12-24
9340912	OPT/PT/APE	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.9 ± 0.3	2019-12-24
9340908	PREPARATION CENTER	2019-12-17 @ 11:00 am	2019-12-20 @ 12:00 pm	0.9 ± 0.4	2019-12-24
9340787	PRINCIPAL	2019-12-17 @ 10:00 am	2019-12-20 @ 11:00 am	1.1 ± 0.4	2019-12-24
9340928	STAGE	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	< 0.3	2019-12-24
9340927	STAGE	2019-12-17 @ 12:00 pm	2019-12-20 @ 11:00 am	0.9 ± 0.4	2019-12-24
9340782	WORKROOM	2019-12-17 @ 11:00 am	2019-12-20 @ 11:00 am	0.8 ± 0.4	2019-12-24

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 193598

NOMINAL Conditions: Radon Conc _____ pCi/L Rel. Hum _____ % Temp. _____ F

Date Start: 12/21/19 Date Stop: 12/23/19

Time Start: 0815 Time Stop: 0815

(Group 1)

Device No.'s: (20) Char. Bags-

9340001 thru 9340020

55

Date Start: 12/21/19 Date Stop: 12/23/19

Time Start: 0829 Time Stop: 0820

(Group 2)

Device No.'s: (20) Char. Bags-

9340021 thru 9340040

54

Date Start: 12/21/19 Date Stop: 12/23/19

Time Start: 0825 Time Stop: 0825

(Group 3)

Device No.'s: (20) Char. Bags-

9340041 thru 9340060

53

Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)
Background = 7 μ R/h Elevation = 820 ft

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
9340067	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 \pm 2.4 D	2020-01-03
9340035	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	22.5 \pm 2.3 D	2020-01-03
9340003	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.2 \pm 2.4 D	2020-01-03
9340089	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	23.3 \pm 2.3 D	2020-01-03
9340072	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	18.3 \pm 2.0 D	2020-01-03
9340040	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.3 \pm 2.6 D	2020-01-03
9340008	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.8 \pm 2.5 D	2020-01-03
9340094	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.7 \pm 2.5 D	2020-01-03
9340099	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.5 \pm 2.6 D	2020-01-03
9340077	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.2 \pm 2.5 D	2020-01-03
9340045	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.7 \pm 2.4 D	2020-01-03
9340013	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.9 \pm 2.6 D	2020-01-03
9340018	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	29.1 \pm 2.8 D	2020-01-03
9341704	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 \pm 2.4 D	2020-01-03
9340050	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.2 \pm 2.6 D	2020-01-03
9340023	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.2 \pm 2.7 D	2020-01-03
9341709	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.5 \pm 2.4 D	2020-01-03
9340055	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.8 \pm 2.6 D	2020-01-03
9340060	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.3 \pm 2.5 D	2020-01-03
9340028	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.9 \pm 2.3 D	2020-01-03
9341714	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	28.3 \pm 2.7 D	2020-01-03
9340082	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.4 \pm 2.6 D	2020-01-03
9340065	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.2 \pm 2.4 D	2020-01-03
9340033	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.2 \pm 2.5 D	2020-01-03
9341719	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.7 \pm 2.5 D	2020-01-03
9340001	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.3 \pm 2.5 D	2020-01-03
9340087	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.8 \pm 2.4 D	2020-01-03
9340070	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	19.5 \pm 2.4 D	2020-01-03
9340038	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.7 \pm 2.3 D	2020-01-03
9340006	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.2 \pm 2.4 D	2020-01-03
9340092	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	31.4 \pm 2.8 D	2020-01-03
9340097	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.7 \pm 2.5 D	2020-01-03
9340075	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	29.6 \pm 2.6 D	2020-01-03
9340043	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.1 \pm 2.6 D	2020-01-03
9340011	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.8 \pm 2.5 D	2020-01-03
9340016	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.2 \pm 2.4 D	2020-01-03
9341702	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.8 \pm 2.5 D	2020-01-03

Radon test result report for:**S****N/A**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340048	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.5 ± 2.4 D	2020-01-03
9340021	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.7 ± 2.6 D	2020-01-03
9341707	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.8 ± 2.4 D	2020-01-03
9340053	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.8 ± 2.5 D	2020-01-03
9340058	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.5 ± 2.7 D	2020-01-03
9340026	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.9 ± 2.4 D	2020-01-03
9341712	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.3 ± 2.4 D	2020-01-03
9340080	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 ± 2.4 D	2020-01-03
9340063	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.8 ± 2.5 D	2020-01-03
9340031	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.9 ± 2.4 D	2020-01-03
9341717	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.7 ± 2.4 D	2020-01-03
9340085	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.9 ± 2.5 D	2020-01-03
9340068	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.2 ± 2.5 D	2020-01-03
9340036	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.6 ± 2.3 D	2020-01-03
9340004	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.9 ± 2.6 D	2020-01-03
9340090	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.3 ± 2.5 D	2020-01-03
9340073	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.8 ± 2.5 D	2020-01-03
9340041	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.6 ± 2.4 D	2020-01-03
9340009	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.1 ± 2.4 D	2020-01-03
9340095	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.2 ± 2.5 D	2020-01-03
9340100	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.5 ± 2.4 D	2020-01-03
9340078	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.0 ± 2.4 D	2020-01-03
9340046	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.0 ± 2.6 D	2020-01-03
9340014	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	21.8 ± 2.8 D	2020-01-03
9340019	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.0 ± 2.5 D	2020-01-03
9341705	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.8 ± 2.6 D	2020-01-03
9340051	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.5 ± 2.4 D	2020-01-03
9340056	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.7 ± 2.6 D	2020-01-03
9340024	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.3 ± 2.5 D	2020-01-03
9341710	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.2 ± 2.3 D	2020-01-03
9340061	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	28.9 ± 2.6 D	2020-01-03
9340029	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	23.0 ± 2.3 D	2020-01-03
9341715	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.0 ± 2.5 D	2020-01-03
9340083	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.9 ± 2.4 D	2020-01-03
9340066	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 ± 2.4 D	2020-01-03
9340034	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.4 ± 2.5 D	2020-01-03
9341720	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.3 ± 2.5 D	2020-01-03

Radon test result report for:**S****N/A**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340002	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.7 ± 2.5 D	2020-01-03
9340088	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.4 ± 2.5 D	2020-01-03
9340071	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.9 ± 2.4 D	2020-01-03
9340039	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.9 ± 2.5 D	2020-01-03
9340007	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.9 ± 2.4 D	2020-01-03
9340093	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 ± 2.5 D	2020-01-03
9340098	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.8 ± 2.5 D	2020-01-03
9340076	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 ± 2.5 D	2020-01-03
9340044	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.2 ± 2.5 D	2020-01-03
9340012	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	22.5 ± 2.2 D	2020-01-03
9340017	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.3 ± 2.5 D	2020-01-03
9341703	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.0 ± 2.5 D	2020-01-03
9340049	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.0 ± 2.5 D	2020-01-03
9340022	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.6 ± 2.6 D	2020-01-03
9341708	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	28.8 ± 2.8 D	2020-01-03
9340054	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.8 ± 2.5 D	2020-01-03
9340059	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.5 ± 2.6 D	2020-01-03
9340027	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.6 ± 2.5 D	2020-01-03
9341713	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.5 ± 2.5 D	2020-01-03
9340081	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	18.4 ± 2.1 D	2020-01-03
9340064	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.5 ± 2.5 D	2020-01-03
9340032	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.1 ± 2.4 D	2020-01-03
9341718	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	23.7 ± 2.4 D	2020-01-03
9340086	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.9 ± 2.6 D	2020-01-03
9340069	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.6 ± 2.5 D	2020-01-03
9340037	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	28.4 ± 2.6 D	2020-01-03
9340005	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	???? DIF1	2020-01-03
9340091	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.5 ± 2.5 D	2020-01-03
9340096	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.2 ± 2.5 D	2020-01-03
9340074	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	27.7 ± 2.5 D	2020-01-03
9340042	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.6 ± 2.5 D	2020-01-03
9340010	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.5 ± 2.5 D	2020-01-03
9341701	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	22.9 ± 2.3 D	2020-01-03
9340047	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	26.7 ± 2.5 D	2020-01-03
9340015	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.4 ± 2.5 D	2020-01-03
9340020	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	24.1 ± 2.4 D	2020-01-03
9341706	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	31.0 ± 2.7 D	2020-01-03

January 3, 2020

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

S

N/A

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9340052	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.4 ± 2.6 D	2020-01-03
9340057	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.3 ± 2.5 D	2020-01-03
9340025	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.1 ± 2.4 D	2020-01-03
9341711	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	22.5 ± 2.2 D	2020-01-03
9340079	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.9 ± 2.5 D	2020-01-03
9340062	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.6 ± 2.5 D	2020-01-03
9340030	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.0 ± 2.4 D	2020-01-03
9341716	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 ± 2.4 D	2020-01-03
9340084	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.5 ± 2.3 D	2020-01-03

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







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Corporate Office: 936 Ridgebrook road • Sparks , Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

Radon Test Kit Chain of Custody

Project Name: MCPS Radon 2019 Week 2

Name of Schools:

- | | |
|-------------------------------|---------------------|
| 1. Argyle M.S. | 13. Candelwood E.S. |
| 2. Banneker M.S. | 14. Drew E.S. |
| 3. Bel Pre E.S. | 15. Fallsmead E.S. |
| 4. Bells Mill E.S. | 16. Farquhar M.S. |
| 5. Bethesda Maintenance Depot | 17. Kennedy H.S. |
| 6. Beverly Farms E.S. | 18. Luxmanor E.S. |
| 7. Blake H.S. | 19. Magruder H.S. |
| 8. Dufief E.S. | 20. Redland M.S. |
| 9. Briggs Chaney M.S. | 21. Shriver E.S. |
| 10. Brookhaven E.S. | 22. Smith Center |
| 11. Burtonsville E.S. | 23. Viers Mill E.S. |
| 12. Cabin John M.S. | 24. Wheaton H.S. |

	Date	Initials
Radon Test Kits Deployed	12/16/19 to 12/17/19	
Radon Test Kits Collected	12/19/19 to 12/20/19	
Radon Test Kits Shipped to Lab*	12/20/19	
Radon Test Kits Received by Lab*	12/23/19	

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

MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Dr. Charles R. Drew Elementary School
Date of Report	February 2, 2018
Round of Testing	Initial Follow-up Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	39
# Rooms ≥ 4.0 pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	2.6 pCi/L

Current Project Status at this time: Testing Completed; no further action at this time.



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February 2, 2018

Mr. Richard Cox, MS
Team Leader
Montgomery County Public Schools
Division of Maintenance
Rockville, Maryland 20855

Re: Radon Testing Services

KCI Job #1214694182

Location: Dr. Charles R. Drew Elementary School

1200 Swingingdale Dr.
Silver Spring , Maryland 20905

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools pursuant to completing a “short-term” 3-day radon test for the Dr. Charles R. Drew Elementary School, located at 1200 Swingingdale Dr. in Silver Spring , Maryland 20905 (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 Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on December 5, 2017 and deployed forty-nine (49) activated charcoal (AC) radon test kits. KCI deployed radon test kits in 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 Appendix A of this report.

As a quality control measure, KCI included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) test kits to

Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner, Inc. prior to being returned to the laboratory for analysis.

KCI returned to the site on December 8, 2017 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Aircheck, Inc. for analysis by gamma-ray spectroscopy. Aircheck, 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:

- 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 at 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 low-30s to mid-40s and high temperatures ranged from the upper-30s to mid-50s. Maximum sustained winds ranged from 4-17 miles per hour. Average humidity was around 60%. 0.16 Inches of precipitation was recorded during the testing period.

RESULTS

The sampling locations, field observations, and analytical results are listed on Table 1 (Appendix B). The laboratory analytical results are also attached (Appendix C). Laboratory results and exposure data for the spike samples are also included in Appendix 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	See Attachment B

Quality Control Samples	
Results of Blank Canisters:	The field blank, office blank, 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.

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The laboratory analytical results are also attached (Attachment C). Laboratory results and exposure data for the spike samples are also included in Attachment C.

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 410-316-7800.

Sincerely,



James Moulds, CHMM
Radon Measurement Specialist
KCI Technologies, Inc.

Attachments:

B- Table 1-Radon Test Summary Spreadsheet

C- Laboratory Analytical Results

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Radon Testing Results		
Dr Charles Drew Elementary School		
Test Period: 12/05/17-12/08/17		
Kit Number	Room / Area	Result
7194065	1	0.6
7194059	2	< 0.3
7194054	3	0.6
7194057	4	1.0
7194053	5	1.1
7194062	6	0.5
7194058	7	0.9
7194052	8	1.1
7194051	9	0.7
7194046	10	0.8
7194045	11	1.8
7194074	14	< 0.3
7194072	15	0.8
7194073	16	0.9
7194075	19	< 0.3
7194056	5A	0.6
7194041	ART	0.7
7194026	* ASST PRINCIPAL (Missing)	-
7194067	BLDG SERV	1.2
7194027	CONFERENCE RM	1.1
7194044	COUNSEL	1.0
7194069	DAYCARE	1.8
7194040	DPR	0.6
7194033	GOF	1.1
7194066	GYM	2.6
7194064	GYM	2.4
7194063	GYM OFFICE	1.5
7194023	HEALTH	1.2
7194049	IMC	1.9
7194048	IMC	1.3
7194078	IMU	1.7
7194036	K1	0.6
7194037	K2	0.8
7194042	K3	1.0
7194043	K4	1.2
7194047	MEDIA OFFICE	1.4
7194068	MPR	1.3
7194031	MPR	1.3
7194038	MUSIC	1.2
7194035	PRICIPAL	1.6
7194055	TV STUDIO	1.6
7194024	WORK ROOM	1.5

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Dr Charlesdrew Elementary School		
Test Period: 12/05/17-12/08/17		
Kit Number	QC Type	Result
7194060	D (1)	0.6
7194070	D (19)	0.8
7194050	D (9)	1.0
7194039	D (DPR)	1.2
7194071	D (MPR)	1.1
7194061	FB (1)	< 0.3
7978195	OB (OFFICE BLANK)	< 0.3

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

December 29, 2017

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**DR CHARLESDREW ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7978195	OFFICE BLANK	2017-12-05 @ 12:00 pm	2017-12-08 @ 12:00 pm	< 0.3	2017-12-11

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

Radon test result report for:**DR CHARLESDREW ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7194065	1	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.6 ± 0.3	2017-12-11
7194060	1	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.6 ± 0.3	2017-12-12
7194061	1	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	< 0.3	2017-12-12
7194046	10	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.8 ± 0.3	2017-12-12
7194045	11	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.8 ± 0.3	2017-12-12
7194074	14	2017-12-05 @ 10:00 am	2017-12-08 @ 9:00 am	< 0.3	2017-12-12
7194072	15	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.8 ± 0.3	2017-12-11
7194073	16	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.9 ± 0.3	2017-12-12
7194075	19	2017-12-05 @ 10:00 am	2017-12-08 @ 9:00 am	< 0.3	2017-12-11
7194070	19	2017-12-05 @ 10:00 am	2017-12-08 @ 9:00 am	0.8 ± 0.3	2017-12-11
7194059	2	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	< 0.3	2017-12-11
7194054	3	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.6 ± 0.3	2017-12-11
7194057	4	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.0 ± 0.3	2017-12-11
7194053	5	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.1 ± 0.3	2017-12-12
7194056	5A	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.6 ± 0.3	2017-12-12
7194062	6	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.5 ± 0.3	2017-12-12
7194058	7	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.9 ± 0.3	2017-12-12
7194052	8	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.1 ± 0.3	2017-12-12
7194051	9	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.7 ± 0.3	2017-12-11
7194050	9	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.0 ± 0.3	2017-12-12
7194041	ART	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	0.7 ± 0.3	2017-12-12
7194026	ASST PRINCIPAL	@	@		
7194067	BLDG SERV	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.2 ± 0.3	2017-12-11
7194027	CONFERENCE RM	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	1.1 ± 0.3	2017-12-11
7194044	COUNSEL	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.0 ± 0.3	2017-12-11
7194069	DAYCARE	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.8 ± 0.4	2017-12-12
7194039	DPR	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	1.2 ± 0.3	2017-12-12
7194040	DPR	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	0.6 ± 0.3	2017-12-12
7194033	GOF	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	1.1 ± 0.3	2017-12-12
7194064	GYM	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	2.4 ± 0.4	2017-12-12
7194066	GYM	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	2.6 ± 0.4	2017-12-12
7194063	GYM OFFICE	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.5 ± 0.4	2017-12-12
7194023	HEALTH	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	1.2 ± 0.3	2017-12-12
7194048	IMC	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.3 ± 0.3	2017-12-11
7194049	IMC	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.9 ± 0.3	2017-12-12
7194078	IMU	2017-12-05 @ 10:00 am	2017-12-08 @ 9:00 am	1.7 ± 0.3	2017-12-11
7194036	K1	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	0.6 ± 0.3	2017-12-12

December 29, 2017

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**DR CHARLESDREW ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7194037	K2	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	0.8 ± 0.3	2017-12-12
7194042	K3	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.0 ± 0.3	2017-12-12
7194043	K4	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.2 ± 0.3	2017-12-12
7194047	MEDIA OFFICE	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.4 ± 0.3	2017-12-11
7194068	MPR	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.3 ± 0.3	2017-12-11
7194031	MPR	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.3 ± 0.3	2017-12-11
7194071	MPR	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.1 ± 0.3	2017-12-11
7194038	MUSIC	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	1.2 ± 0.3	2017-12-12
7194035	PRICIPAL	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	1.6 ± 0.3	2017-12-12
7194055	TV STUDIO	2017-12-05 @ 9:00 am	2017-12-08 @ 9:00 am	1.6 ± 0.3	2017-12-12
7194024	WORK ROOM	2017-12-05 @ 8:00 am	2017-12-08 @ 9:00 am	1.5 ± 0.3	2017-12-12

Air Chek, Inc. 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 Phase

Names of Schools:

- | | |
|--|---------------------------------|
| 1. John T. Baker Middle School | 15. Whetstone Elementary School |
| 2. Cedar Grove Elementary School | |
| 3. Clarksburg Elementary School | |
| 4. Clarksburg Elementary School Annex | |
| 5. Clarksburg High School | |
| 6. Clearspring Elementary School | |
| 7. Damascus Elementary School | |
| 8. Damascus High School | |
| 9. Dr. Charles R. Drew Elementary School | |
| 10. Facilities Maintenance Depot - Shop | |
| 11. Lake Seneca Elementary School | |
| 12. Laytonville Elementary School | |
| 13. Watkins Mill Elementary School | |
| 14. Watkins Mill High School | |

	Date	Initials
Radon Test Kits Deployed	12/05/17	JM
Radon Test Kits Collected	12/08/17	JM
Radon Test Kits Shipped to Lab*	12/08/17	JM
Radon Test Kits Received by Lab*	12/13/17	JM

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

Radon test result report for:**TRANSIT 2
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7193838	TRANSIT 1	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979384	TRANSIT 10	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979385	TRANSIT 11	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7984056	TRANSIT 12	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7983834	TRANSIT 13	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7194097	TRANSIT 14	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7194092	TRANSIT 15	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7193840	TRANSIT 16	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979072	TRANSIT 17	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979071	TRANSIT 18	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979065	TRANSIT 19	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	0.6 ± 0.4	2017-12-13
7978194	TRANSIT 2	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7985660	TRANSIT 20	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7985661	TRANSIT 21	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	0.7 ± 0.4	2017-12-13
7193843	TRANSIT 22	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7984055	TRANSIT 23	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7983813	TRANSIT 24	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7983827	TRANSIT 25	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7978193	TRANSIT 3	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7978189	TRANSIT 4	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	0.5 ± 0.4	2017-12-13
7986187	TRANSIT 5	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7986188	TRANSIT 6	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7986177	TRANSIT 7	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979077	TRANSIT 8	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13
7979386	TRANSIT 9	2017-12-05 @ 2:00 pm	2017-12-08 @ 2:00 pm	< 0.3	2017-12-13

December 19, 2017

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Laboratory Results. Measured values are satisfactory, i.e. within $\pm 25\%$ of the chamber's reference value (27.7 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7975075	S1	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	25.6 \pm 0.7	2017-12-07
7975064	S2	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	27.4 \pm 0.8	2017-12-07
7975063	S3	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	26.3 \pm 0.7	2017-12-07
7975065	S4	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	23.0 \pm 0.7	2017-12-07
7975069	S5	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	25.6 \pm 0.7	2017-12-07
7975070	S6	2017-12-01 @ 11:00 am	2017-12-04 @ 11:00 am	23.0 \pm 0.7	2017-12-07

Air Chek, Inc. 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 182393

NOMINAL Conditions: Radon Conc 27.7 pCi/L Rel. Hum 49.1 % Temp. 70.1 F

Date Start: 12/1/17 Date Stop: 12/4/17 Date Start: _____ Date Stop: _____

Time Start: 1049 Time Stop: 1049 Time Start: _____ Time Stop: _____

Device No.'s: (6) Char. Bags. Device No.'s: _____

7975075, 7975064, 7975063, _____

7975065, 7975069, 7975070 _____

F4 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 RADON TESTING

Executive Summary: Dr. Charles Drew Elementary School

Date of Test Report:	10/19/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	3
# Rooms \geq 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	1.1

Project Status:

Post remediation testing completed; no further action at this time.



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October 19, 2016

Mr. Richard Cox
Indoor Air Quality Team Leader
Montgomery County Public Schools
850 Hungerford Drive
Rockville, MD 20850

Re: **Radon Testing Services**
KCI Job # 12146341.54

Location: Dr. Charles Drew Elementary School
1200 Swingingdale Drive
Silver Spring, Maryland 20905

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Dr. Charles Drew Elementary School, located at 1200 Swingingdale Drive in Silver Spring, Maryland 20905 (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 Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on September 27, 2016 and deployed six (6) activated charcoal (AC) radon test kits. KCI deployed radon test kits in 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 included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) 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 September 30, 2016 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:

- Post-mitigation testing for radon mitigation systems installed recently

To expedite the testing, tests were conducted in September as soon as students and staff returned to:

- Confirm the success of the mitigation system(s)

Future periodic testing should be conducted during the heating season in ideal conditions as described below. 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 cooling mode; therefore, KCI concludes that this test was not conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room at 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 in the mid-60s to mid-70s. Maximum sustained winds ranged from 3-15 miles per hour. Average humidity ranged from 71 to 89 percent. Rain (1.83 inches in Gaithersburg, MD) was recorded on 9/29/16. The weather conditions during the testing period may have resulted in atypical radon test results for this facility.

Results:

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	

Notes:

D- Duplicate sample

The field blank, office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L. Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved. The Spike sample analysis results indicate the laboratory is operating within statistical control limits.

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The laboratory analytical results are also attached (Attachment C). Laboratory results and exposure data for the spike samples are also included in Attachment C.

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) 316-7800.

Sincerely,



James M. Moulds
Radon Measurement Specialist
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-Radon Test Summary Spreadsheet
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Radon Testing Results		
Drew Elementary School		
Test Period: 09/27/16-09/30/16		
Kit Number	Room / Area	Result
7802351	BUILDING SERVICE	< 0.3
7802348	GYM	1.1
7802352	GYM	0.7
7802349	GYM OFFICE	0.6

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Drew Elementary School		
Test Period: 09/27/16-09/30/16		
Kit Number	QC Type	Result
7802353	D (GYM OFFICE)	< 0.3
7802366	FB (BUILDING SERVICE)	< 0.3

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

October 7, 2016

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**DREW ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7802351	BUILDING SERVICE	2016-09-27 @ 2:00 pm	2016-09-30 @ 2:00 pm	< 0.3	2016-10-03
7802366	BUILDING SERVICE	2016-09-27 @ 2:00 pm	2016-09-30 @ 2:00 pm	< 0.3	2016-10-03
7802352	GYM	2016-09-27 @ 2:00 pm	2016-09-30 @ 2:00 pm	0.7 ± 0.2	2016-10-03
7802348	GYM	2016-09-27 @ 2:00 pm	2016-09-30 @ 2:00 pm	1.1 ± 0.2	2016-10-03
7802349	GYM OFFICE	2016-09-27 @ 2:00 pm	2016-09-30 @ 2:00 pm	0.6 ± 0.2	2016-10-03
7802353	GYM OFFICE	2016-09-27 @ 2:00 pm	2016-09-30 @ 2:00 pm	< 0.3	2016-10-03

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

October 7, 2016

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS Radon

Phase 18 Office Blanks

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7802697	1	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7801899	10	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802932	11	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802935	12	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802915	13	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802941	2	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802942	3	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802919	4	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802918	5	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802917	6	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802916	7	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802952	8	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03
7802928	9	2016-09-26 @ 11:00 am	2016-09-29 @ 11:00 am	< 0.3	2016-10-03

October 7, 2016

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS Radon

Phase 18 Transit Blanks

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7714274	1	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802962	10	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714295	11	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714299	12	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714273	13	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714270	14	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802965	2	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802696	3	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802690	4	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714275	5	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7714298	6	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802990	7	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802974	8	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03
7802694	9	2016-09-26 @ 10:00 am	2016-09-29 @ 10:00 am	< 0.3	2016-10-03

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

October 12, 2016

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
MCPS Radon
Spike Sample Results

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7769880	101	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	22.9 ± 1.0	2016-09-28
7769884	102	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	22.4 ± 1.0	2016-09-28
7769885	103	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	23.0 ± 1.0	2016-09-28
7769890	104	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	22.3 ± 1.0	2016-09-28
7769891	105	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	26.8 ± 1.2	2016-09-28
7769899	106	2016-09-24 @ 8:00 am	2016-09-26 @ 8:00 am	24.1 ± 1.1	2016-09-28

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

Note: Spike samples are test canisters that are deliberately exposed to a controlled high level of radon in a laboratory. They provide a quality control measure in the testing process and do NOT reflect radon levels in the building being tested.

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 176788

NOMINAL Conditions: Radon Conc 26.1 pCi/L Rel. Hum 49.6 % Temp. 70.0 F

Date Start: 9/24/16 Date Stop: 9/26/16 Date Start: _____ Date Stop: _____

Time Start: 0758 Time Stop: 0758 Time Start: _____ Time Stop: _____

Device No.'s: (6) Char. Bags - Device No.'s: _____

7769899, 7769884, 7769885, _____

7769889, 7769890, 7769891 _____

F3 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 μ R/h Elevation = 820 ft



Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 18

Name of Schools:

- | | |
|-------------------------------------|--|
| 1. Wood Acres Elementary School | 14. Lourie Center |
| 2. Walt Whitman High School | 15. Shriver Elementary School |
| 3. Burning Tree Elementary School | 16. Viers Mill Elementary School |
| 4. Ashburton Elementary School | 17. Highland Elementary School |
| 5. Bethesda Maintenance | 18. Newport Middle School |
| 6. Bethesda Transportation | 19. Albert Einstein High School |
| 7. Herbert Hoover Middle School | 20. Sligo Middle School |
| 8. Cold Spring Elementary School | 21. East Silver Spring Elementary School |
| 9. Garret Park Elementary School | 22. Oak View Elementary School |
| 10. Rock View Elementary School | 23. Roscoe Nix Elementary School |
| 11. Francis Scott Key Middle School | 24. Northwood High School |
| 12. Montgomery Blair High School | 25. Springbrook High School |
| 13. Stephen Knolls School | 26. John F. Kennedy High School |

	Date	Initials
Radon Test Kits Deployed	9/26/16	JM
Radon Test Kits Collected	9/29/16	JM
Radon Test Kits Shipped to Lab*	9/30/16	JM
Radon Test Kits Received by Lab*	10/03/16	JM

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



Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 18

Name of Schools:

- | | |
|--|-----------------------------------|
| 1. Damascus High School | 17. Watkins Mills High School |
| 2. Cedar Grove Elementary School | 18. Forest Oak Middle School |
| 3. Hallie Wells Middle School | 19. Gaithersburg Middle School |
| 4. Clarksburg Elementary School | 20. Emory Grove |
| 5. Clarksburg High School | 21. Fields Road Elementary School |
| 6. Woodlin Elementary School | 22. Beall Elementary School |
| 7. Flora Singer Elementary School | 23. Julius West Middle School |
| 8. Spring Mill Center | 24. Thomas Wootton High School |
| 9. Dr. Charles Drew Elementary School | 25. Robert Frost High School |
| 10. William Farquah Middle School | 26. Travilah Elementary School |
| 11. Rosa Parks Middle School | 27. Jones Lane Elementary School |
| 12. Blair Ewing Center | 28. Longview School |
| 13. Lathrop Smith Environmental Center | 29. Rock Terrace High School |
| 14. Sequoyah Elementary School | 30. Germantown Elementary School |
| 15. Shady Grove Middle School | 31. Lake Seneca Elementary School |
| 16. Captain James Daly Elementary School | |

	Date	Initials
Radon Test Kits Deployed	9/27/16	JM
Radon Test Kits Collected	9/30/16	JM
Radon Test Kits Shipped to Lab*	9/30/16	JM
Radon Test Kits Received by Lab*	10/03/16	JM

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

**RADON SCREENING SURVEY – FOLLOW-UP DR CHARLES DREW ELEMENTARY
SCHOOL**

1200 Swingingdale Drive, Silver Spring, Maryland 20905

EXECUTIVE SUMMARY

Date of Test Report:	3/16/16 Follow-Up
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested	3
# Rooms \geq 4.0 pCi/L:	2
Low Value:	1.1
High Value:	8.4
Confirmed Rooms \geq 4.0 pCi/L US EPA Action Level	2

Summary of Sampling Events \geq 4.0 pCi/L

Room	Result (pCi/L) 3/11/16 (Rev 1 Initial)	Result (pCi/L) 3/16/16 Follow-Up	Average Result (pCi/L)
Gym	4.5	5.3	4.9
Gym	3.5	8.2	5.9
K2	--- Missing	1.1	1.1
Gym Office	Not Tested	8.4	8.4



MCPS RADON TESTING

Executive Summary: Dr. Charles Drew Elementary School

Date of Test Report:	3/16/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	3
# Rooms \geq 4.0 pCi/L:	2
Low Value:	1.1
High Value:	8.4

Rooms with results \geq 4.0 pCi/L:

Room 130 – Gym Office (8.4 pCi/L), and Room 129 - Gym (8.2 pCi/L and 5.3 pCi/L).

Project Status:

Retesting completed; use the average of the initial and re-test results in a room to determine if remediation is necessary.



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March 16, 2016

Mr. Richard Cox
Indoor Air Quality Team Leader
Montgomery County Public Schools
850 Hungerford Drive
Rockville, MD 20850

Re: **Radon Testing Services**
KCI Job # 12146341.29

Location: Dr. Charles Drew Elementary School
1200 Swingingdale Drive
Silver Spring, Maryland 20905

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Dr. Charles Drew Elementary School, located at 1200 Swingingdale Drive in Silver Spring, Maryland 20905 (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 Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on February 22, 2016 and deployed six (6) activated charcoal (AC) radon test kits. KCI deployed radon test kits in 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 included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) 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, 2016 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:

The operating condition that represents the greatest amount of significantly occupied time for this building is; heating active, with outdoor temperature averages $\leq 65^{\circ}\text{F}$.

KCI concludes that the test period reasonably represents normal conditions when the building is significantly occupied. Clear characterization of the radon hazard is most likely to be observed under this normal operating condition. Based on the evaluation of test conditions, this test should reasonably characterize radon hazards.

KCI also conducted observations of field conditions which could affect the results of the test and compiled weather data for the testing period. Note that strong storms and heavy rainfall were recorded during the test period. The unusual weather conditions may have resulted in atypical radon test results for this facility.

KCI recorded observations of the following conditions in each room at 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.

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥ 4.0 pCi/L	130 – Gym Office	8.4
	129 - Gym	8.2
	129 – Gym	5.3
< 4.0 pCi/L	See Attachment B	

Notes:

D- Duplicate sample

The field blank, office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L. Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved. The Spike sample analysis results indicate the laboratory is operating within statistical control limits.

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The laboratory analytical results are also attached (Attachment C). Laboratory results and exposure data for the spike samples are also included in Attachment C.

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) 316-7800.

Sincerely,



James M. Moulds
Radon Measurement Specialist
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-Radon Test Summary Spreadsheet
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank*

PM- Project Manager

QC- Quality Control

*Office blanks were submitted at a rate of 1% for all samples deployed in Phase 9 testing. Office blanks were not submitted under each school individually.

Radon Testing Results		
Drew Elementary School		
Test Period: 02/22/16-02/25/16		
Kit Number	Room / Area	Result
7730088	129 - GYM	8.2
7730089	129 - GYM	5.3
7730087	130 - GYM OFFICE	8.4
7730084	K2	1.1

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Drew Elementary School		
Test Period: 02/22/16-02/25/16		
Kit Number	QC Type	Result
7730085	D (K2)	1.0
7730083	FB (K2)	< 0.3

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

March 8, 2016

**** LABORATORY ANALYSIS
REPORT ****

Radon test result report for:
**DREW ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7730088	129 - GYM	2016-02-22 @ 12:00 pm	2016-02-25 @ 11:00 am	8.2 ± 0.5	2016-02-29
7730089	129 - GYM	2016-02-22 @ 12:00 pm	2016-02-25 @ 11:00 am	5.3 ± 0.5	2016-02-29
7730087	130 - GYM OFFICE	2016-02-22 @ 12:00 pm	2016-02-25 @ 11:00 am	8.4 ± 0.6	2016-02-29
7730083	K2	2016-02-22 @ 12:00 pm	2016-02-25 @ 11:00 am	< 0.3	2016-02-29
7730084	K2	2016-02-22 @ 12:00 pm	2016-02-25 @ 11:00 am	1.1 ± 0.3	2016-02-29
7730085	K2	2016-02-22 @ 12:00 pm	2016-02-25 @ 11:00 am	1.0 ± 0.3	2016-02-29

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

March 9, 2016

**** LABORATORY ANALYSIS
REPORT ****

Radon test result report for:

MCPS

Phase 9 Office Blanks

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7712568	0	2016-02-22 @ 6:00 pm	2016-02-25 @ 3:00 pm	< 0.3	2016-02-29
7712584	0	2016-02-22 @ 6:00 pm	2016-02-25 @ 3:00 pm	< 0.3	2016-02-29
7719460	0	2016-02-22 @ 6:00 pm	2016-02-25 @ 3:00 pm	< 0.3	2016-02-29
7719481	0	2016-02-22 @ 6:00 pm	2016-02-25 @ 3:00 pm	< 0.3	2016-02-29
7719497	0	2016-02-22 @ 6:00 pm	2016-02-25 @ 3:00 pm	< 0.3	2016-02-29
7719498	0	2016-02-22 @ 6:00 pm	2016-02-25 @ 3:00 pm	< 0.3	2016-02-29

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

March 9, 2016

**** LABORATORY ANALYSIS
REPORT ****

Radon test result report for:

MCPS

Phase 9 Office Blanks

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7731626	0	2016-02-23 @ 2:00 pm	2016-02-26 @ 3:00 pm	< 0.3	2016-03-01
7731633	0	2016-02-23 @ 2:00 pm	2016-02-26 @ 3:00 pm	< 0.3	2016-03-01
7735204	0	2016-02-23 @ 2:00 pm	2016-02-26 @ 3:00 pm	< 0.3	2016-03-01

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Radon test result report for:
TRANSIT- PHASE 7, 8, 9
NONE

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7734937	1	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734946	10	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734955	11	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734956	12	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734959	13	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734930	14	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734953	15	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734954	16	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734940	17	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734949	18	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734948	19	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734939	2	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734942	20	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734929	21	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734933	22	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734934	23	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734936	24	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734943	25	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734944	26	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734935	27	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734928	28	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734952	29	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734947	3	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734931	30	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734932	31	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718520	32	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718523	33	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718522	34	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7718521	35	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734945	4	2016-02-19 @ 3:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734960	5	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734958	6	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734951	7	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734957	8	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23
7734938	9	2016-02-19 @ 4:00 pm	2016-02-22 @ 11:00 am	< 0.3	2016-02-23

February
15,
2016

**** LABORATORY ANALYSIS
REPORT ****

Spike Sample Laboratory Results

Radon test result report for:
MCPS

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7718273	101A	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.5 ± 0.6	2016-02-04
7718281	102B	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.4 ± 0.6	2016-02-04
7718282	103C	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.3 ± 0.6	2016-02-04
7718288	104D	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.7 ± 0.6	2016-02-04
7718289	105E	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.6 ± 0.6	2016-02-04
7718291	106F	2016-01-30 @ 9:00 am	2016-02-01 @ 9:00 am	6.5 ± 0.6	2016-02-04

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

Note: Spike samples are test canisters that are deliberately exposed to a controlled high level of radon in a laboratory. They provide a quality control measure in the testing process and do NOT reflect radon levels in the building being tested.

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCF Technologies Inc. Job Number 173704

NOMINAL Conditions: Radon Conc 5.9 pCi/L Rel. Hum 45.9 % Temp. 79.0 F

Date Start: 11/30/16 Date Stop: 2/1/16

Date Start: _____ Date Stop: _____

Time Start: 0926 Time Stop: 0926

Time Start: _____ Time Stop: _____

Device No.'s: (6) Char. Bags -

Device No.'s: _____

7718281, 7718282, 7718291,

7718288, 7718289, 7718273

3 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 μ R/h Elevation = 820 ft



Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 9

Name of Schools:

- | | | |
|--------------------------|---------------------------|------------------------|
| 1. Rocking Horse Road ES | 16. Broad Acres ES | 31. Rosa Parks MS |
| 2. Rockwell ES | 17. Belmont ES | 32. Rosemary Hills ES |
| 3. Oakland Terrace ES | 18. Emory Grove Center | 33. Sequoyah ES |
| 4. Rosemont ES | 19. Forest Knolls ES | 34. Damascus HS |
| 5. Beall ES | 20. Baker MS | 35. Einstein ES |
| 6. Cresthaven ES | 21. MLK MS | 36. Forest Oak MS |
| 7. Quince Orchard HS | 22. Richard Montgomery HS | 37. Hoover MS |
| 8. Smith Center | 23. Sherwood HS | 38. Julius West MS |
| 9. Ashburton ES | 24. Walter Johnson HS | 39. John F. Kennedy HS |
| 10. Bannockburn ES | 25. Diamond ES | 40. Travilah ES |
| 11. Bradley Hills ES | 26. Newport Mill MS | 41. Watkins Mill HS |
| 12. Cannon Road ES | 27. Drew ES | 42. Northwood HS |
| 13. Flora M. Singer ES | 28. Monocacy ES | 43. Lincoln Center |
| 14. Clarksburg HS | 29. Potomac ES | |
| 15. Briggs Chaney MS | 30. Rock Terrace School | |

	Date	Initials
Radon Test Kits Deployed	2/22/16	JM
Radon Test Kits Collected	2/25/16	JM
Radon Test Kits Shipped to Lab*	2/25/16	JM
Radon Test Kits Received by Lab*	2/29/16	JM

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



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS
Corporate Office: 936 Ridgebrook road • Sparks , Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 9

Name of Schools:

- | | |
|----------------------------|-------------------------|
| 1. Banneker MS | 10. Maryvale ES |
| 2. Bethesda-Chevy Chase HS | 11. Montgomery Blair HS |
| 3. Burtonsville ES | 12. Poolesville HS |
| 4. Chevy Chase ES | 13. Rachel Carson ES |
| 5. Clopper Mill ES | 14. Stedwick ES |
| 6. Edison HS | 15. Watkins Mill ES |
| 7. Flower Hill ES | 16. Laytonsville ES |
| 8. Flower Valley ES | 17. Lincoln Center |
| 9. Greencastle ES | |

	Date	Initials
Radon Test Kits Deployed	2/23/16	JM
Radon Test Kits Collected	2/26/16	JM
Radon Test Kits Shipped to Lab*	2/26/16	JM
Radon Test Kits Received by Lab*	3/01/16	JM

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



MCPS RADON TESTING

Executive Summary: Dr. Charles Drew Elementary School

Date of Test Report:	3/11/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	40
# Rooms ≥ 4.0 pCi/L:	1
Low Value:	< 0.3
High Value:	4.5

Rooms with results ≥ 4.0 pCi/L:
Gym (4.5 pCi/L)

Project Status:

Initial testing completed; re-test needed for results ≥ 4.0 pCi/L.
Initial testing completed; missing or compromised samples need re-test.



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

March 11, 2016 (Rev 1)

Mr. Richard Cox
Indoor Air Quality Team Leader
Montgomery County Public Schools
850 Hungerford Drive
Rockville, MD 20850

Re: **Radon Testing Services**
KCI Job # 12146341.22

Location: Dr. Charles Drew Elementary School
1200 Swingingdale Drive
Silver Spring, MD 20905

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to the Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for the Dr. Charles Drew Elementary School, located at 1200 Swingingdale Drive in Silver Spring, Maryland 20905 (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 Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on December 28, 2015 and deployed fifty (50) activated charcoal (AC) radon test kits. KCI deployed radon test kits in 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 included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) 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 December 31, 2015 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:

The operating condition that represents the greatest amount of significantly occupied time for this building is; heating active, with outdoor temperature averages $\leq 65^{\circ}$ F.

KCI concludes that the test period reasonably represents normal conditions when the building is significantly occupied. Clear characterization of the radon hazard is most likely to be observed under this normal operating condition. Based on the evaluation of test conditions, this test should reasonably characterize radon hazards.

KCI also conducted observations of field conditions which could affect the results of the test and compiled weather data for the testing period. KCI recorded observations of the following conditions in each room at 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.

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥ 4.0 pCi/L	Gym	4.5
< 4.0 pCi/L	See Attachment B	

Notes:

D- Duplicate sample

All field blanks, office blank, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L. Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved. The Spike sample analysis results indicate the laboratory is operating within statistical control limits.

The sampling locations, field observations, and analytical results are listed on Table 1 (Attachment B). The laboratory analytical results are also attached (Attachment C). Laboratory results and exposure data for the spike samples are also included in Attachment C.

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) 316-7800.

Sincerely,



James M. Moulds
Radon Measurement Specialist
KCI Technologies, Inc.

Attachments: A- Floor Plan with Test Locations
 B- Table 1-Radon Test Summary Spreadsheet
 C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Radon Testing Results		
Dr. Charles Drew E.S.		
Test Period: 12/28/15-12/31/15		
Kit Number	Room / Area	Result
7708252	1	0.6
7708251	2	< 0.3
7710270	3	1.0
7710271	4	0.9
7710277	5	< 0.3
7707140	6	< 0.3
7710269	7	< 0.3
7710274	8	1.0
7710272	9	< 0.3
7710278	10	0.8
7710279	11	2.9
7708263	28	1.2
7707142	29	< 0.3
7707139	30	0.8
7710258	102	1.2
7710244	103	1.0
7710293	104	1.1
7710261	105	0.9
7710263	106	1.0
7710262	108	1.3
7710264	109	0.9
7710265	110	0.8
7707119	128	1.4
7707141	146	1.0
7710273	157	1.0
7710275	157	1.2
7710280	158	1.2
7710288	174	0.5
7707136	27SPT	1.1
7710286	APR	< 0.3
7710285	ART	0.9
7710281	ESOL	1.1
7708257	GYM	3.5
7707117	GYM	4.5
7710291	K1	< 0.3
7710298	* K2 (missing)	-
7710284	K3	< 0.3
7710283	K4	1.1
7707094	MPR	1.5
7707114	MPR	1.2
7710287	MU	0.7
7707115	MUSIC	1.5
7708250	STAFF	< 0.3

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Dr. Charles Drew E.S.		
Test Period: 12/28/15-12/31/15		
Kit Number	QC Type	Result
7710259	D (105)	0.8
7707143	D (128)	1.2
7707144	D (27SPT)	1.1
7710282	D (K4)	1.0
7710260	FB (105)	< 0.3
7710276	FB (157)	< 0.3
7708249	OB (0)	< 0.3

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

January 16, 2016

**** LABORATORY ANALYSIS
REPORT ****

Radon test result report for:
**DR. CHARLES DREW ES
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7707117	GYM	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	4.5 ± 0.6	2016-01-05
7708257	GYM	2015-12-28 @ 11:00 am	2015-12-31 @ 9:00 am	3.5 ± 0.5	2016-01-05

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

Radon test result report for:
DR. CHARLES DREW E.S.
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708249	0	2015-12-28 @ 12:00 pm	2015-12-31 @ 10:00 am	< 0.3	2016-01-04
7708252	1	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	0.6 ± 0.3	2016-01-04
7710278	10	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	0.8 ± 0.3	2016-01-05
7710258	102	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	1.2 ± 0.3	2016-01-04
7710244	103	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	1.0 ± 0.3	2016-01-04
7710293	104	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	1.1 ± 0.3	2016-01-04
7710259	105	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	0.8 ± 0.3	2016-01-04
7710260	105	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-04
7710261	105	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	0.9 ± 0.3	2016-01-04
7710263	106	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	1.0 ± 0.3	2016-01-04
7710262	108	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	1.3 ± 0.4	2016-01-05
7710264	109	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	0.9 ± 0.3	2016-01-04
7710279	11	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	2.9 ± 0.5	2016-01-05
7710265	110	2015-12-28 @ 10:00 am	2015-12-31 @ 8:00 am	0.8 ± 0.4	2016-01-05
7707119	128	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.4 ± 0.4	2016-01-05
7707143	128	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.2 ± 0.4	2016-01-05
7707141	146	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.0 ± 0.4	2016-01-05
7710275	157	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.2 ± 0.3	2016-01-04
7710273	157	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.0 ± 0.4	2016-01-05
7710276	157	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-05
7710280	158	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	1.2 ± 0.3	2016-01-04
7710288	174	2015-12-28 @ 10:00 am	2015-12-31 @ 10:00 am	0.5 ± 0.3	2016-01-04
7708251	2	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-05
7707136	27SPT	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.1 ± 0.3	2016-01-04
7707144	27SPT	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.1 ± 0.3	2016-01-04
7708263	28	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.2 ± 0.3	2016-01-04
7707142	29	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-05
7710270	3	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.0 ± 0.3	2016-01-04
7707139	30	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	0.8 ± 0.4	2016-01-05
7710271	4	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	0.9 ± 0.3	2016-01-04
7710277	5	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-05
7707140	6	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-05
7710269	7	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-05
7710274	8	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.0 ± 0.3	2016-01-04
7710272	9	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-04
7710286	APR	2015-12-28 @ 11:00 am	2015-12-31 @ 10:00 am	< 0.3	2016-01-04
7710285	ART	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	0.9 ± 0.3	2016-01-04

January 16, 2016

**** LABORATORY ANALYSIS
REPORT ****

Radon test result report for:
**DR. CHARLES DREW E.S.
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7710281	ESOL	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.1 ± 0.4	2016-01-05
7710291	K1	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-04
7710298	K2	@	@		
7710284	K3	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-04
7710282	K4	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.0 ± 0.4	2016-01-05
7710283	K4	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.1 ± 0.4	2016-01-05
7707094	MPR	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.5 ± 0.4	2016-01-05
7707114	MPR	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.2 ± 0.4	2016-01-05
7710287	MU	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	0.7 ± 0.4	2016-01-05
7707115	MUSIC	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	1.5 ± 0.4	2016-01-05
7708250	STAFF	2015-12-28 @ 11:00 am	2015-12-31 @ 8:00 am	< 0.3	2016-01-05

Radon test result report for:
**MCPS PHASE 3 & 4
TRANSIT BLANKS**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7708218	TRANSIT 4	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708200	TRANSIT 1	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708190	TRANSIT 10	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708189	TRANSIT 11	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708191	TRANSIT 12	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708188	TRANSIT 13	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708197	TRANSIT 14	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708186	TRANSIT 15	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708185	TRANSIT 16	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708184	TRANSIT 17	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708182	TRANSIT 18	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708187	TRANSIT 18	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708199	TRANSIT 2	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708181	TRANSIT 20	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708180	TRANSIT 21	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708183	TRANSIT 22	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708178	TRANSIT 23	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708179	TRANSIT 24	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708177	TRANSIT 25	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708176	TRANSIT 26	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708174	TRANSIT 27	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708173	TRANSIT 28	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708175	TRANSIT 29	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708198	TRANSIT 3	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708172	TRANSIT 30	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708194	TRANSIT 5	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708196	TRANSIT 6	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708193	TRANSIT 7	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708192	TRANSIT 8	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23
7708195	TRANSIT 9	2015-12-18 @ 12:00 pm	2015-12-21 @ 12:00 pm	< 0.3	2015-12-23

December
23,
2015

****LABORATORY ANALYSIS
REPORT ****

Spike Sample Laboratory Results

Radon test result report for:
MCPS

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7706380	101	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	25.2	2015-12-23
7706381	102	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	26.5	2015-12-23
7706208	103	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	27.7	2015-12-23
7705132	104	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	28.6	2015-12-23
7706366	105	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	26.5	2015-12-23
7706211	106	2015-12-18 @ 9:00 am	2015-12-21 @ 9:00 am	26.1	2015-12-23

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

Note: Spike samples are test canisters that are deliberately exposed to a controlled high level of radon in a laboratory. They provide a quality control measure in the testing process and do NOT reflect radon levels in the building being tested.

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 173224

NOMINAL Conditions: Radon Conc 26.9 pCi/L Rel. Hum 49.6 % Temp. 69.9 F

Date Start: 12/18/15 Date Stop: 12/21/15 Date Start: _____ Date Stop: _____

Time Start: 0929 Time Stop: 0929 Time Start: _____ Time Stop: _____

Device No.'s: 7705132, 7706208, Device No.'s: _____

7706211, 7706366, _____

7706380, 7706381 _____

F3 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 μ R/h Elevation = 820 ft



ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS
Corporate Office: 936 Ridgebrook road • Sparks , Maryland 21152 • 410-316-7800 • (Fax) 410-316-7935

Chain of Custody

Project Name: MCPS Radon Phase III

Name of Schools:

- | | | |
|-----------------------|-----------------------|-----------------------|
| 1. Burnt Mills ES | 13. Georgian Frost ES | 25. Northlake Center |
| 2. Burtonsville ES | 14. Germantown ES | 26. Olney ES |
| 3. Cedar Grove ES | 15. Goshen ES | 27. Rosa Parks MS |
| 4. Cloverly ES | 16. Greencastle ES | 28. Poolesville ES |
| 5. Cold Spring ES | 17. Greenwood ES | 29. Poolesville HS |
| 6. Damascus HS | 18. Lake Seneca ES | 30. Potomac ES |
| 7. Darnestown ES | 19. Laytonsville ES | 31. Rock Terrace HS |
| 8. Diamond ES | 20. Col. E. Brooke MS | 32. Rosemary Hills ES |
| 9. Charles R. Drew ES | 21. Luxmanor ES | 33. Carl Sandburg |
| 10. DuFief ES | 22. Magruder HS | 34. Sequoyah ES |
| 11. Thomas Edison HS | 23. Thur. Marshall ES | 35. Stedwick ES |
| 12. Robert Frost MS | 24. Monocacy ES | 36. Whetstone ES |
-

	Date	Initials
Radon Test Kits Deployed	12/28/15	JM
Radon Test Kits Sampled	12/31/15	JM
Radon Test Kits Shipped to Lab*	12/31/15	JM
Radon Test Kits Received by Lab*	1/4/16	JM

*All samples sent to Air Check, Inc., 1936 Butler Bridge Road, Mills River, NC 28758