



**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	South Lake Elementary School
Date of Report	2/28/2020
Round of Testing	Initial <b>Follow-up</b> Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	1
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	0.9 pCi/L

**Project Status**

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



2/28/2020

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

Re: Radon Testing Services

KCI Job #1214634188

**Location: South Lake Elementary School**

18201 Contour Road  
Gaithersburg, Maryland 20877

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 South Lake Elementary School, located at 18201 Contour Road in Gaithersburg, Maryland 20877 (subject site).

**SCOPE OF SERVICES**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from [www.montgomerycountymd.gov/dep/air/radon](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on 2/4/2020 and deployed five (5) 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.

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

1. Rooms with missing test kits from the December 2019 testing period (i.e. test kit was deployed but not recovered),

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2. Rooms with invalidated test kits from the December 2019 testing period (e.g. an open window in the room or disturbed test kit),
  3. Rooms which were locked/inaccessible during the December 2019 testing period,
  4. Rooms with elevated December 2019 results (i.e.  $\geq 3.5$  pCi/L),
  5. Rooms previously tested for radon but not tested in December 2019, and
  6. Additional rooms that require testing (if applicable.)

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 2/7/2020 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:

- 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 ranged from the mid-30s to the low-50s; and high temperatures ranged from the upper-40s to the mid-60s. Maximum sustained winds ranged from 13-21 miles per hour. Average humidity was approximately 76%. A total of 1.09 Inches of rain were recorded during the testing period. The weather conditions during the testing period may have resulted in atypical radon test results for this facility.

**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). Follow-up 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  
 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

### Floor Plan Legend

X-Sample Location (in red)

X- Previous Sample Location

1- Not Samled; No Ground Contact

2- Not Samled; Unoccupied (e.g. Storage, Mechanical)

3- Not Samled; High Humidity/Moisture

4- Not Samled; Bathroom/Hallway

# 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		
South Lake Elementary School		
Test Period: 02/04/20-02/07/20		
Kit Number	Room / Area	Result
9339948	STAGE	0.7
9339953	STAGE	<0.3
9339954	STAGE	0.9
9334909	OFFICE BLANK	<0.3
9334910	OFFICE BLANK	<0.3



Table 2- Radon Testing Results			
South Lake Elementary School			
Test Period: 02/04/20-02/07/20			
Kit Number	QC Type	Room / Area	Result
9339954	D	STAGE	0.9
9339953	FB	STAGE	<0.3
9334902	TRANSIT BLANK	NA	<0.3

# ATTACHMENT C

## Laboratory Analytical Results

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February 11, 2020

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9339948	STAGE	2020-02-04 @ 8:00 am	2020-02-07 @ 8:00 am	0.7 ± 0.3	2020-02-11
9339953	STAGE	2020-02-04 @ 8:00 am	2020-02-07 @ 8:00 am	< 0.3	2020-02-11
9339954	STAGE	2020-02-04 @ 8:00 am	2020-02-07 @ 8:00 am	0.9 ± 0.3	2020-02-11

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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 194523

NOMINAL Conditions: Radon Conc 25.8 pCi/L Rel. Hum 49.8 % Temp. 70.2 F

Date Start: 2/21/20 Date Stop: 2/24/20 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0745 Time Stop: 0745 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (9) Char Bags - Device No.'s: \_\_\_\_\_

9341725 thru 9341733

52 ccp

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  $\mu$ 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).

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9341725	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.9 $\pm$ 1.6	2020-02-26
9341730	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.1 $\pm$ 1.6	2020-02-26
9341728	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.9 $\pm$ 1.6	2020-02-26
9341726	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	25.8 $\pm$ 1.5	2020-02-26
9341731	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	25.1 $\pm$ 1.5	2020-02-26
9341729	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	26.2 $\pm$ 1.6	2020-02-26
9341727	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	27.2 $\pm$ 1.6	2020-02-26
9341732	N/A	2020-02-21 @ 8:00 am	2020-02-24 @ 8:00 am	27.3 $\pm$ 1.6	2020-02-26



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon 2019 Week 1 Retesting

Name of Schools:

1. Belmont E.S.
2. Clarksburg H.S.
3. Damascus E.S.
4. Damascus H.S.
5. DuFief E.S.
6. Fields Road E.S.
7. Gaithersburg E.S.
8. McAuliffe E.S.
9. Quince Orchard H.S.
10. Snowden Farms E.S.
11. South Lake E.S.
12. Stone Mill E.S.
13. Travilah ES
14. Watkins Mill ES
15. Whitman H.S.

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	Date	Initials
Radon Test Kits Deployed	02/03/20 to 02/04/20	JM
Radon Test Kits Collected	02/06/20 to 02/07/20	JM
Radon Test Kits Shipped to Lab*	02/07/20	JM
Radon Test Kits Received by Lab*	02/10/20	JM

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



**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	South Lake Elementary School
Date of Report	1/28/2020
Round of Testing	Initial Follow-up Post Remediation <b>2 year testing</b> 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	64
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	2.5 pCi/L

**Project Status**

Current Project Status at this time: Testing Complete; missed locations and missing/compromised tests to be sampled.



1/28/2020

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: South Lake Elementary School**

18201 Contour Road  
Gaithersburg, Maryland 20877

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 South Lake Elementary School, located at 18201 Contour Road in Gaithersburg, Maryland 20877 (subject site).

**SCOPE OF SERVICES**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Proficiency Program (NRPP) Radon Measurement Specialist (certification #111004 RT) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from <https://www.montgomeryschoolsmd.org/departments/facilities/maintenance/default.aspx?id=458858> or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on 12/10/2019 and deployed seventy-eight (78) 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.



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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 12/13/2019 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 NRSB certified analytical laboratory for radon analysis (certification #ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

### **EVALUATION OF TESTING CONDITIONS**

These tests represent:

- Follow-up to initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility's HVAC system was operating in heating mode; therefore, KCI concludes that this test was conducted during ideal testing conditions.

KCI recorded observations of the following conditions in each room 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 upper-30s and high temperatures ranged from the upper-30s to the mid-50s. Maximum sustained winds ranged from 7-21 miles per hour. Average humidity was around 75%. 0.52 inches of precipitation (rain) was recorded during the testing period.

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## **RESULTS**

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Sampling locations and associated test kit identification numbers and relevant field observations are listed on Table 3 (Attachment B). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
≥4.0 pCi/L	none	N/A
≤4.0 pCi/L	See Attachment B	See Attachment B

<b>Quality Control Samples</b>	
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

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# 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		
South Lake Elementary School		
Test Period: 12/10/2019-12/13/2019		
Kit Number	Room / Area	Result
9334001	STAFF 1	2.4
9334002	COMP 1	1.3
9334003	CONF 1	2.5
9334004	OFF 1	1.2
9334005	HE 1	1.1
9334006	PR 1	1.1
9334007	CR 2	0.8
9334008	CR 3	1.1
9334009	CR 4	1.2
9334010	CR 5	1.7
9334011	CR 8	0.6
9334012	CR 8	< 0.3
9334013	CR 3	1
9334014	CR 6	0.9
9334015	CR 7	1
9334016	CR 9	< 0.3
9334017	OFF 2	< 0.3
9334018	OFF 3	< 0.3
9334019	CR 12B	< 0.3
9334020	INST 14B	0.7
9334021	CR 12B	< 0.3
9334022	CR 12C	< 0.3
9334023	CR 13C	< 0.3
9334024	CR 13B	< 0.3
9334025	CR10	< 0.3
9334026	CR 11	< 0.3
9334027	MU 14A	< 0.3
9334028	K-5	0.8
9334030	CR 18	0.8
9334031	CR 17	0.8
9334032	CR 16	1.4
9334033	CR 16	1.7
9334034	CR 15	0.6
9334035	K-4	< 0.3
9334036	K-3	0.5
9334037	CR 14	0.7
9334038	MU 14A	< 0.3
9334039	CR30	0.8
9334040	K-6	< 0.3
9334041	K-4	0.7
9334042	IMC	1.1
9334043	MPR	< 0.3
9334044	CR21	< 0.3
9334045	ISM1	< 0.3
9334046	IMC	0.6
9334047	MR1	1.1
9334048	OFF2	0.6
9334049	OFF3	0.6
9334050	K-1	< 0.3
9334051	CR24B	< 0.3

9334052	CR22	0.7
9334053	K-2	< 0.3
9334054	K-2	< 0.3
9334055	K-2A	0.5
9334056	OFF4	< 0.3
9334057	MPR	0.6
9334059	CR23	0.5
9334060	CR25	< 0.3
9334061	MPR	< 0.3
9334062	CR19	< 0.3
9334063	CR20	0.5
9334064	CR21	0.9
9334065	CR24	< 0.3
9334066	SPT	1
9334067	CR31	< 0.3
9334068	CR32	< 0.3
9334069	ART33	0.6
9334070	ART33	< 0.3
9334071	GYM	< 0.3
9334072	GYM	< 0.3
9334073	OFF5	< 0.3
9334074	CR34	< 0.3
9334075	CR34	< 0.3
9334076	CR36	< 0.3
9334077	CR35	< 0.3
9334078	CR40	< 0.3
9334079	CR41	< 0.3
9334081	CR43	< 0.3
9334082	CR41	< 0.3
9334701	MAIN	0.8
9334702	MAIN	0.8
9334080	CR42	< 0.3
9334986	OFFICE BLANK	< 0.3
9334058	STA	MISSING



Table 2- Radon Testing Results			
South Lake Elementary School			
Test Period: 12/10/2019-12/13/2019			
Kit Number	QC Type	Room / Area	Result
9334702	D	MAIN	0.8
9334013	D	CR 3	1
9334012	FB	CR 8	<0.3
9334021	D	CR 12B	<0.3
9334032	D	CR 16	1.4
9334027	FB	MU 14A	<0.3
9334041	D	K-4	0.7
9334053	D	K-2	<0.3
9334061	FB	MPR	<0.3
9334064	D	CR21	0.9
9334069	D	ART33	0.6
9334075	FB	CR34	<0.3
9334079	D	CR41	<0.3
9334850	TRANSIT BLANK	NA	< 0.3
9334914	TRANSIT BLANK	NA	< 0.3
9334916	TRANSIT BLANK	NA	< 0.3
9334963	TRANSIT BLANK	NA	< 0.3

# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:  
**SOUTH LAKE ES**  
**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9334070	ART33	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334069	ART33	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	0.6 ± 0.3	2019-12-17
9334002	COMP 1	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.3 ± 0.3	2019-12-17
9334003	CONF 1	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	2.5 ± 0.4	2019-12-16
9334026	CR 11	2019-12-10 @ 10:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334021	CR 12B	2019-12-10 @ 9:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334019	CR 12B	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334022	CR 12C	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334024	CR 13B	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334023	CR 13C	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334037	CR 14	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.7 ± 0.3	2019-12-16
9334034	CR 15	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.6 ± 0.3	2019-12-16
9334032	CR 16	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	1.4 ± 0.3	2019-12-16
9334033	CR 16	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	1.7 ± 0.3	2019-12-16
9334031	CR 17	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.8 ± 0.3	2019-12-16
9334030	CR 18	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.8 ± 0.3	2019-12-17
9334007	CR 2	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	0.8 ± 0.3	2019-12-16
9334008	CR 3	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.1 ± 0.3	2019-12-16
9334013	CR 3	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.0 ± 0.3	2019-12-16
9334009	CR 4	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.2 ± 0.3	2019-12-16
9334010	CR 5	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.7 ± 0.3	2019-12-16
9334014	CR 6	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	0.9 ± 0.3	2019-12-16
9334015	CR 7	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.0 ± 0.3	2019-12-16
9334012	CR 8	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334011	CR 8	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	0.6 ± 0.3	2019-12-17
9334016	CR 9	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334025	CR10	2019-12-10 @ 10:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334062	CR19	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-16
9334063	CR20	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.5 ± 0.3	2019-12-17
9334044	CR21	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-16
9334064	CR21	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.9 ± 0.3	2019-12-17
9334052	CR22	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.7 ± 0.3	2019-12-17
9334059	CR23	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.5 ± 0.3	2019-12-16
9334065	CR24	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334051	CR24B	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334060	CR25	2019-12-10 @ 12:00 pm	2019-12-13 @ 11:00 am	< 0.3	2019-12-16
9334039	CR30	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.8 ± 0.3	2019-12-17

Radon test result report for:  
**SOUTH LAKE ES**  
**MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9334067	CR31	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334068	CR32	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334075	CR34	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334074	CR34	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334077	CR35	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334076	CR36	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334078	CR40	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334082	CR41	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334079	CR41	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334081	CR43	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334071	GYM	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334072	GYM	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334005	HE 1	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.1 ± 0.3	2019-12-16
9334042	IMC	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	1.1 ± 0.3	2019-12-16
9334046	IMC	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.6 ± 0.3	2019-12-17
9334020	INST 14B	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.7 ± 0.3	2019-12-16
9334045	ISM1	2019-12-10 @ 10:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334050	K-1	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334053	K-2	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-16
9334054	K-2	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334055	K-2A	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.5 ± 0.3	2019-12-17
9334036	K-3	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.5 ± 0.3	2019-12-17
9334035	K-4	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334041	K-4	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.7 ± 0.3	2019-12-17
9334028	K-5	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	0.8 ± 0.3	2019-12-17
9334040	K-6	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334702	MAIN	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	0.8 ± 0.3	2019-12-16
9334701	MAIN	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	0.8 ± 0.3	2019-12-17
9334057	MPR	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.6 ± 0.3	2019-12-17
9334061	MPR	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334043	MPR	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334047	MR1	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	1.1 ± 0.3	2019-12-16
9334027	MU 14A	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334038	MU 14A	2019-12-10 @ 10:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-17
9334004	OFF 1	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.2 ± 0.3	2019-12-17
9334017	OFF 2	2019-12-10 @ 9:00 am	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334018	OFF 3	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-16

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December 17, 2019

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:  
**SOUTH LAKE ES**  
**MAIN**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9334048	OFF2	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.6 ± 0.3	2019-12-16
9334049	OFF3	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	0.6 ± 0.3	2019-12-17
9334056	OFF4	2019-12-10 @ 11:00 am	2019-12-13 @ 11:00 am	< 0.3	2019-12-17
9334073	OFF5	2019-12-10 @ 12:00 pm	2019-12-13 @ 12:00 pm	< 0.3	2019-12-16
9334006	PR 1	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	1.1 ± 0.3	2019-12-16
9334066	SPT	2019-12-10 @ 12:00 pm	2019-12-13 @ 11:00 am	1.0 ± 0.3	2019-12-17
9334001	STAFF 1	2019-12-10 @ 9:00 am	2019-12-13 @ 11:00 am	2.4 ± 0.4	2019-12-16

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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 KEI Technologies Inc. Job Number 193475

NOMINAL Conditions: Radon Conc 25.7 pCi/L Rel. Hum 74.6 % Temp. 69.9 F

Date Start: 12/13/19 Date Stop: 12/16/19 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
Time Start: 0806 Time Stop: 0806 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
(Group 1)  
Device No.'s: (20) Char. Bags - Device No.'s: \_\_\_\_\_  
9334502 thru 9334510,  
9334514, 9334516, 9334517,  
9334519, 9334519  
9334522 thru 9334528  
B4

Date Start: 12/13/19 Date Stop: 12/16/19 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
0811  
Time Start: 0806 acm Time Stop: 0811 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
(Group 2)  
Device No.'s: (20) Char. Bags - Device No.'s: \_\_\_\_\_  
9334529 thru 9334538,  
9334540,  
9334542 thru 9334550  
B3

Date Start: 12/13/19 Date Stop: 12/16/19 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_  
Time Start: 0816 Time Stop: 0816 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_  
(Group 3)  
Device No.'s: (20) Char. Bags - Device No.'s: \_\_\_\_\_  
9334551, 9334552, 9334562,  
9334555 thru 9334559,  
9334569, 9334576, 9334579,  
9334580, 9334583, 9334584,  
9334591, 9334593, 9334594,  
9334597, 9334598, 9334599  
B2

Note: All times are in 24-hour (military) notation, Eastern Standard Time (EST)  
Background = 7  $\mu$ 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
9334583	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334529	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 $\pm$ 1.5	2019-12-18
9334597	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 $\pm$ 1.4	2019-12-18
9334534	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334540	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.9 $\pm$ 1.4	2019-12-18
9334546	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.9 $\pm$ 1.5	2019-12-18
9334551	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334558	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334579	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334593	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334532	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334537	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 $\pm$ 1.4	2019-12-18
9334544	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 $\pm$ 1.4	2019-12-18
9334549	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18
9334556	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334569	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334584	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18
9334530	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 $\pm$ 1.4	2019-12-18
9334598	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334535	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.0 $\pm$ 1.4	2019-12-18
9334542	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334547	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	25.2 $\pm$ 1.5	2019-12-18
9334552	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.2 $\pm$ 1.4	2019-12-18
9334559	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334580	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334594	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334533	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 $\pm$ 1.5	2019-12-18
9334538	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.6 $\pm$ 1.5	2019-12-18
9334545	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.0 $\pm$ 1.4	2019-12-18
9334550	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 $\pm$ 1.4	2019-12-18
9334557	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.6 $\pm$ 1.5	2019-12-18
9334576	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 $\pm$ 1.4	2019-12-18
9334591	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 $\pm$ 1.4	2019-12-18
9334531	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 $\pm$ 1.5	2019-12-18
9334599	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 $\pm$ 1.4	2019-12-18
9334536	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18
9334543	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 $\pm$ 1.5	2019-12-18

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December 18, 2019

**\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:

**N/A**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9334548	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.0 ± 1.4	2019-12-18
9334555	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.4 ± 1.4	2019-12-18
9334562	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 ± 1.4	2019-12-18

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



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

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9334505	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.5 ± 1.5	2019-12-18
9334510	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.4 ± 1.5	2019-12-18
9334522	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.9 ± 1.4	2019-12-18
9334527	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	22.6 ± 1.4	2019-12-18
9334503	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 ± 1.4	2019-12-18
9334508	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.7 ± 1.5	2019-12-18
9334517	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 ± 1.4	2019-12-18
9334525	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 ± 1.4	2019-12-18
9334506	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.3 ± 1.5	2019-12-18
9334514	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.5 ± 1.5	2019-12-18
9334523	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.6 ± 1.4	2019-12-18
9334528	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 ± 1.4	2019-12-18
9334504	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.8 ± 1.4	2019-12-18
9334509	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.5 ± 1.4	2019-12-18
9334519	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.1 ± 1.4	2019-12-18
9334526	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.3 ± 1.4	2019-12-18
9334502	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	23.7 ± 1.4	2019-12-18
9334507	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.7 ± 1.5	2019-12-18
9334516	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	22.2 ± 1.3	2019-12-18
9334524	N/A	2019-12-13 @ 8:00 am	2019-12-16 @ 8:00 am	24.6 ± 1.5	2019-12-18



### Radon Test Kit Chain of Custody

Project Name: MCPS Radon 2019 Week 1

Name of Schools:

- |                             |                         |
|-----------------------------|-------------------------|
| 1. Baker M.S.               | 13. Jones Lane E.S.     |
| 2. Belmont E.S.             | 14. Lake Seneca E.S.    |
| 3. Clarksburg E.S.          | 15. McAuliffe E.S.      |
| 4. Clarksburg H.S.          | 16. Quince Orchard H.S. |
| 5. Clearspring E.S.         | 17. Rosa Parks M.S.     |
| 6. Damascus E.S.            | 18. Snowden Farm E.S.   |
| 7. Damascus H.S.            | 19. South Lake E.S.     |
| 8. Dufief E.S.              | 20. Stone Mill E.S.     |
| 9. Fields Road E.S.         | 21. Travilah E.S.       |
| 10. Gaithersburg E.S.       | 22. Watkins Mill E.S.   |
| 11. Germantown E.S.         | 23. Watkins Mill H.S.   |
| 12. Great Seneca Creek E.S. | 24. Whitman H.S.        |

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	Date	Initials
Radon Test Kits Deployed	12/09/19 to 12/10/19	JM
Radon Test Kits Collected	12/12/19 to 12/13/19	JM
Radon Test Kits Shipped to Lab*	12/13/19	JM
Radon Test Kits Received by Lab*	12/16/19	JM

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



**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	South Lake Elementary School
Date of Report	March 15, 2018
Round of Testing	Initial <b>Follow-up</b> Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	21
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.7 pCi/L

**Project Status**

Current Project Status at this time: Retesting completed; no further action at this time.



March 15, 2018

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

Re: Radon Testing Services

KCI Job #1214634188

**Location: South Lake Elementary School**

18201 Contour Rd.  
Gaithersburg, Maryland 20877

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 South Lake Elementary School, located at 18201 Contour Rd. in Gaithersburg, Maryland 20877 (subject site).

**SCOPE OF SERVICES**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on February 20, 2018 and deployed twenty-three (23) 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.

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

1. Rooms not successfully tested,
2. Rooms with elevated November 2017 results (i.e.  $\geq 3.5$  pCi/L).

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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 February 23, 2018 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:

- 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 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 ranged from the high-30s to low-60s and high temperatures ranged from the mid-40s to the high-70s. Maximum sustained winds ranged from 9-15 miles per hour. Average humidity was around 83%. 0.32 Inches of precipitation was recorded during the testing period.

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## **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). The laboratory analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
≥4.0 pCi/L	None	N/A
≤4.0 pCi/L	See Attachment B	See Attachment B

<b>Quality Control Samples</b>	
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,



Radon Measurement Specialist  
KCI Technologies, Inc.

Attachments:

B - Radon Test Summary Spreadsheets

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



<b>Table 1 - Radon Testing Results</b>		
<b>South Lake Elementary School</b>		
<b>Test Period: 02/20/18-02/23/18</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7986588	1	1.1
7986626	7	1.1
7979479	16	0.9
7984187	30	0.7
7984191	12A	< 0.3
7986599	12B	< 0.3
7984192	12C	< 0.3
7984189	14C	< 0.3
7984190	14D	0.6
7986542	24A	1.2
7984165	33A	< 0.3
7984161	44A	< 0.3
7986620	BLDG SRV OFFICE	0.8
7984162	CONFERENCE 2	0.7
7986619	CONFERENCE 3	0.9
7979476	ESOL	< 0.3
7986598	GYM OFFICE/38A	< 0.3
7986600	HEALTH ROOM	1.1
7986587	ISM	0.7
7986543	KITCHEN	1.7
7986541	WORK ROOM	1.0

Table Note:

\* Missing or Compromised Sample

South Lake Elementary School		
Test Period: 02/20/18-02/23/18		
Kit Number	QC Type	Result
7986544	D (CONFERENCE 2)	1.1
7985667	D (CONFERENCE 3)	0.7

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:**MCPS 2018****SOUTH LAKE ELEMENTARY SCHOOL  
MAIN**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7986588	1	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	1.1	2018-02-26
7984191	12A	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7986599	12B	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7984192	12C	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7984189	14C	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7984190	14D	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	0.6	2018-02-26
7979479	16	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	0.9	2018-02-26
7986542	24A	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	1.2	2018-02-26
7984187	30	2018-02-20 @ 6:00 am	2018-02-23 @ 9:00 am	0.7	2018-02-26
7984165	33A	2018-02-20 @ 6:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7984161	44A	2018-02-20 @ 6:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7986626	7	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	1.1	2018-02-26
7986620	BLDG SRV OFFICE	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	0.8	2018-02-26
7986544	CONFERENCE 2	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	1.1	2018-02-26
7984162	CONFERENCE 2	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	0.7	2018-02-26
7985667	CONFERENCE 3	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	0.7	2018-02-26
7986619	CONFERENCE 3	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	0.9	2018-02-26
7979476	ESOL	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7986598	GYM OFFICE/38A	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	< 0.3	2018-02-26
7986600	HEALTH ROOM	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	1.1	2018-02-26
7986587	ISM	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	0.7	2018-02-26
7986543	KITCHEN	2018-02-20 @ 7:00 am	2018-02-23 @ 9:00 am	1.7	2018-02-26
7986541	WORK ROOM	2018-02-20 @ 8:00 am	2018-02-23 @ 9:00 am	1.0	2018-02-26



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase

Names of Schools:

1. South Lake Elementary School

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	Date	Initials
Radon Test Kits Deployed	2/20/18	JM
Radon Test Kits Collected	2/23/18	JM
Radon Test Kits Shipped to Lab*	2/23/18	JM
Radon Test Kits Received by Lab*	2/26/18	JM

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

Radon test result report for:  
**OFFICE BLANKS**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7979482	1	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986991	10	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985684	11	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986987	12	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986993	13	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986990	14	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7979485	2	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985686	3	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986995	4	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986989	5	2018-02-13 @ 1:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986998	6	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986986	7	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986985	8	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986997	9	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20

Radon test result report for:  
**TRANSIT BLANKS**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7984188	1	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7984044	10	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986582	11	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986999	12	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7987000	13	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7984196	14	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986996	2	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986994	3	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7986992	4	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985680	5	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985698	6	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985699	7	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985700	8	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20
7985872	9	2018-02-13 @ 2:00 pm	2018-02-16 @ 2:00 pm	< 0.3	2018-02-20

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February 28, 2018

**\*\* LABORATORY ANALYSIS REPORT \*\***

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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 (20.9 pCi/L).**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7984181	1	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.7 $\pm$ 0.8	2018-02-21
7986621	2	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.4 $\pm$ 0.8	2018-02-21
7985683	3	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.5 $\pm$ 0.8	2018-02-21
7984168	4	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.5 $\pm$ 0.8	2018-02-21
7986618	5	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	19.9 $\pm$ 0.8	2018-02-21
7984169	6	2018-02-16 @ 11:00 am	2018-02-19 @ 11:00 am	20.4 $\pm$ 0.8	2018-02-21

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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 183530

NOMINAL Conditions: Radon Conc 20.9 pCi/L Rel. Hum 49.8 % Temp. 79.1 F

Date Start: <u>2/16/18</u> Date Stop: <u>2/19/18</u>	Date Start: _____ Date Stop: _____
Time Start: <u>1052</u> Time Stop: <u>1052</u>	Time Start: _____ Time Stop: _____
Device No.'s: <u>(6) Char. Bags</u>	Device No.'s: _____
<u>7984181, 7986621, 7985683</u>	_____
<u>7984168, 7986618, 7984169</u>	_____
<u>G3 Middle</u>	_____

Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____

Date Start: _____ Date Stop: _____	Date Start: _____ Date Stop: _____
Time Start: _____ Time Stop: _____	Time Start: _____ Time Stop: _____
Device No.'s: _____	Device No.'s: _____
_____	_____
_____	_____

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



**MCPS RADON TESTING - EXECUTIVE SUMMARY**

Site Name	South Lake Elementary School
Date of Report	February 2, 2018
Round of Testing	Initial Follow-up Post Remediation <b>2 year testing</b> 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	58
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	2.2 pCi/L

Current Project Status at this time: Results satisfactory to date; missed locations and missing/compromised tests to be sampled.



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: South Lake Elementary School**

18201 Contour Rd.  
Gaithersburg, Maryland 20877

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 South Lake Elementary School, located at 18201 Contour Rd. in Gaithersburg, Maryland 20877 (subject site).

**SCOPE OF SERVICES**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on December 4, 2017 and deployed seventy-three (73) 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 7, 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 high-20s to mid-40s and high temperatures ranged from the low-40s to mid-50s. Maximum sustained winds ranged from 12-17 miles per hour. Average humidity was around 65%. 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 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). Missing/compromised tests, missed rooms, and locked rooms are listed on Table 3 (Attachment B). The laboratory

analytical results are included in Attachment C. Laboratory results and exposure data for the spike samples are also included in Attachment C.

The results of the radon test analysis indicated the following:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
$\geq 4.0$ pCi/L	None	N/A
$\leq 4.0$ pCi/L	See Attachment B	See Attachment B

<b>Quality Control Samples</b>	
Results of Blank Canisters:	The field blanks, 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.

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 Mouldale, CHMM  
Radon Measurement Specialist  
KCI Technologies, Inc.

Attachments:

B- Tables 1-3, Radon Test Summary Spreadsheets

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		
South Lake Elementary School		
Test Period: 12/04/17-12/07/17		
Kit Number	Room / Area	Result
7985753	2	0.8
7985725	3	1.6
7985718	4	1.7
7985723	5	2.2
7985722	6	1.1
7986036	8	1.4
7986014	9	0.8
7986068	10	0.8
7986038	11	0.8
7986042	14	0.5
7986052	15	1.1
7986054	17	1.4
7986051	18	1.1
7986032	19	0.9
7986031	20	0.9
7986077	21	0.9
7986030	22	0.7
7986091	23	1.6
7986027	24	1.2
7986099	31	< 0.3
7986100	32	0.6
7986097	33	< 0.3
7986098	34	1.0
7986082	35	< 0.3
7986045	37	< 0.3
7986076	38	0.8
7986059	38	0.8
7986085	40	0.9
7986016	41	0.6
7986090	42	0.8
7986081	43	< 0.3
7985721	* 1 (Missing)	-
7986049	12B	0.7
7986050	13A	1.2
7985720	13B	0.7
7985731	13C	1.1
7986084	14A	0.6
7986040	14A	0.8
7986069	14B	0.7
7986061	* 24A (Missing)	-
7986083	37A	0.7
7986046	38A	1.2
7985778	* 7 (Open Door)	0.9
7985719	A16	1.7
7986093	APR	1.2
7986026	APR	0.8

Table Note:

\* Missing or Compromised Sample



<b>Radon Testing Results</b>		
<b>South Lake Elementary School</b>		
<b>Test Period: 12/04/17-12/07/17</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7986035	C2	0.6
7986060	CONFERENCE	1.1
7986028	COU	1.4
7986037	IMC	1.3
7985783	IMC	2.2
7986013	K1	0.6
7986021	K2A	< 0.3
7986034	K2B	0.7
7986043	K3	0.7
7986070	K4	0.6
7986041	K5	< 0.3
7986044	K6	< 0.3
7986053	MAIN OFFICE	1.1
7986062	PRINCIPAL	2.1
7986094	SECRETARY	1.3
7986086	STAFF LOUNGE	1.8

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>South Lake Elementary School</b>		
<b>Test Period: 12/04/17-12/07/17</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7985729	D (13C)	0.9
7985784	D (15)	0.9
7985737	D (2)	1.7
7986039	D (37A)	0.9
7986089	D (42)	0.7
7986092	D (COU)	1.4
7986033	D (K2A)	0.6
7985730	FB (13C)	< 0.3
7986047	FB (15)	< 0.3
7986029	FB (COU)	< 0.3
7193831	OB (OFFICE BLANK)	< 0.3

Table Note:

\* Missing or Compromised Sample



# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:

**SOUTH LAKE ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7985721	1	@	@		
7986068	10	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.8 ± 0.4	2017-12-12
7986038	11	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.8 ± 0.4	2017-12-11
7986049	12B	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.7 ± 0.4	2017-12-12
7986050	13A	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.2 ± 0.4	2017-12-12
7985720	13B	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.7 ± 0.4	2017-12-12
7985730	13C	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-11
7985731	13C	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.1 ± 0.4	2017-12-11
7985729	13C	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.9 ± 0.4	2017-12-12
7986042	14	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.5 ± 0.4	2017-12-11
7986084	14A	2017-12-04 @ 12:00 pm	2017-12-07 @ 11:00 am	0.6 ± 0.3	2017-12-11
7986040	14A	2017-12-04 @ 12:00 pm	2017-12-07 @ 11:00 am	0.8 ± 0.3	2017-12-11
7986052	15	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.1 ± 0.4	2017-12-12
7986047	15	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-12
7985784	15	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.9 ± 0.4	2017-12-12
7986054	17	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.4 ± 0.4	2017-12-12
7986051	18	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.1 ± 0.3	2017-12-11
7986032	19	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.9 ± 0.4	2017-12-12
7985737	2	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.7 ± 0.4	2017-12-11
7985753	2	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.8 ± 0.4	2017-12-11
7986031	20	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.9 ± 0.4	2017-12-12
7986077	21	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.9 ± 0.4	2017-12-12
7986030	22	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.7 ± 0.4	2017-12-12
7986091	23	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.6 ± 0.4	2017-12-12
7986027	24	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.2 ± 0.4	2017-12-12
7986061	24A	@	@		
7985725	3	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.6 ± 0.4	2017-12-11
7986069	14B	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.7 ± 0.4	2017-12-12
7986099	31	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-12
7986100	32	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.6 ± 0.3	2017-12-11
7986097	33	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-12
7986098	34	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.0 ± 0.4	2017-12-12
7986082	35	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-12
7986045	37	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-11
7986083	37A	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.7 ± 0.4	2017-12-12
7986039	37A	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.9 ± 0.4	2017-12-12
7986059	38	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.8 ± 0.4	2017-12-12

Radon test result report for:

**SOUTH LAKE ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7986076	38	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.8 ± 0.3	2017-12-12
7986046	38A	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.2 ± 0.4	2017-12-12
7985718	4	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.7 ± 0.4	2017-12-11
7986085	40	2017-12-04 @ 12:00 pm	2017-12-07 @ 11:00 am	0.9 ± 0.3	2017-12-11
7986016	41	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.6 ± 0.4	2017-12-12
7986090	42	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.8 ± 0.4	2017-12-12
7986089	42	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.7 ± 0.4	2017-12-12
7986081	43	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-12
7985723	5	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	2.2 ± 0.4	2017-12-12
7985722	6	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.1 ± 0.4	2017-12-11
7985778	7	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	0.9 ± 0.4	2017-12-11
7986036	8	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.4 ± 0.4	2017-12-11
7986014	9	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.8 ± 0.4	2017-12-12
7985719	A16	2017-12-04 @ 1:00 pm	2017-12-07 @ 11:00 am	1.7 ± 0.4	2017-12-11
7986026	APR	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	0.8 ± 0.4	2017-12-11
7986093	APR	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.2 ± 0.4	2017-12-12
7986035	C2	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.6 ± 0.3	2017-12-11
7986060	CONFERENCE	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.1 ± 0.4	2017-12-11
7986092	COU	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.4 ± 0.4	2017-12-11
7986028	COU	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.4 ± 0.4	2017-12-12
7986029	COU	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	< 0.3	2017-12-12
7985783	IMC	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	2.2 ± 0.4	2017-12-12
7986037	IMC	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	1.3 ± 0.4	2017-12-12
7986013	K1	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.6 ± 0.4	2017-12-11
7986033	K2A	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.6 ± 0.4	2017-12-11
7986021	K2A	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	< 0.3	2017-12-11
7986034	K2B	2017-12-04 @ 12:00 pm	2017-12-07 @ 10:00 am	0.7 ± 0.4	2017-12-12
7986043	K3	2017-12-04 @ 12:00 pm	2017-12-07 @ 11:00 am	0.7 ± 0.4	2017-12-11
7986070	K4	2017-12-04 @ 12:00 pm	2017-12-07 @ 11:00 am	0.6 ± 0.3	2017-12-11
7986041	K5	2017-12-04 @ 12:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-12
7986044	K6	2017-12-04 @ 12:00 pm	2017-12-07 @ 11:00 am	< 0.3	2017-12-11
7986053	MAIN OFFICE	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.1 ± 0.4	2017-12-12
7193831	OFFICE BLANK	2017-12-04 @ 12:00 pm	2017-12-07 @ 12:00 pm	< 0.3	2017-12-12
7986062	PRINCIPAL	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	2.1 ± 0.5	2017-12-12
7986094	SECRETARY	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.3 ± 0.4	2017-12-12
7986086	STAFF LOUNGE	2017-12-04 @ 11:00 am	2017-12-07 @ 10:00 am	1.8 ± 0.4	2017-12-11



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase

Names of Schools:

1. Brooke Grove Elementary School
2. Brown Station Elementary School
3. Diamond Elementary School Addition
4. Dufief Elementary School
5. Emory Grove Center
6. Fields Road Elementary School
7. Facilities Maintenance Depot
8. Forest Oak Middle School
9. Francis Scott Key Middle School
10. Gaithersburg Elementary School
11. Gaithersburg Middle School
12. Germantown Elementary School
13. Greenwood Elementary School
14. Jones Lane Elementary School
14. Newport Mill Middle School
15. Oakview Elementary School
16. Quince Orchard High School
17. Robert Frost Middle School
18. Rosa Parks Middle School
19. South Lake Elementary School

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	Date	Initials
Radon Test Kits Deployed	12/04/17	JM
Radon Test Kits Collected	12/07/17	JM
Radon Test Kits Shipped to Lab*	12/07/17	JM
Radon Test Kits Received by Lab*	12/11/17	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



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December 19, 2017

**\*\* LABORATORY ANALYSIS REPORT \*\***

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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).**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
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

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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  $\mu$ R/h Elevation = 820 ft



## MCPS RADON TESTING

### Executive Summary: South Lake Elementary School

Date of Test Report:	4/20/2016
Round of Testing:	Initial Follow up Post Remediation
# Rooms Tested:	67
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	2.4

#### Project Status:

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

**RADON SCREENING SURVEY – POST REMEDIATION SAMPLING SOUTH LAKE  
ELEMENTARY SCHOOL**

18201 Contour Road, Gaithersburg, Maryland 20877

**EXECUTIVE SUMMARY**

Date of Test Report:	4/20/16 Post Remediation
Round of Testing:	Initial Follow-up <b>Post Remediation</b>
# Rooms Tested	67
# Rooms $\geq$ 4.0 pCi/L:	0
Low Value:	<0.3
High Value:	2.4
Confirmed Rooms $\geq$ 4.0 pCi/L US EPA Action Level	0

**Summary of Sampling Events  $\geq$  4.0 pCi/L**

Room	Result (pCi/L) 3/1/2016 (Rev 1 Initial)	Result (pCi/L) Follow-Up	Average Result (pCi/L)	Post Remediation (pCi/L) 4/20/16
14B	7.3	Not Tested	7.3	<0.3
14A	6.6	Not Tested	6.6	0.5
44A	5.0	Not Tested	5.0	Not tested, unoccupied wire closet
30	4.9	Not Tested	4.9	0.7
38A	4.4	Not Tested	4.4	<0.3
40	4.0	Not Tested	4.0	0.6
14	3.6	Not Tested	3.6	<0.3
33 Art	3.7	Not Tested	3.7	<0.3
33A	3.6	Not Tested	3.6	Not tested, unoccupied art storage



April 20, 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 # 12146341.34

Location: South Lake Elementary School  
18201 Contour Road  
Gaithersburg, MD 20877

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 South Lake Elementary School, located at 18201 Contour Road in Gaithersburg, Maryland 20877 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on March 29, 2016 and deployed seventy-nine (79) 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 April 1, 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  $\leq 65^{\circ}$  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.

School personnel informed KCI during the sample collection that numerous windows were opened for extended periods during the testing due to a problem with the facility's HVAC system.

**Results:**

The results of the radon test analysis indicated the following:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
$\geq 4.0$ pCi/L	none	n/a
$< 4.0$ pCi/L	See Attachment B	

Notes:

D- Duplicate sample

The field blanks, 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. Mouldale  
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 13 testing. Office blanks were not submitted under each school individually.

<b>Radon Testing Results</b>		
<b>South Lake Elementary School</b>		
<b>Test Period: 03/29/16-04/01/16</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7747601	19	< 0.3
7747602	20	< 0.3
7747603	21	1.1
7747604	22	0.5
7747605	23	0.8
7747606	24	< 0.3
7747661	35	< 0.3
7747647	14A MUSIC	0.5
7747675	14B MUSIC	< 0.3
7747640	14D STORAGE	0.6
7747611	APR	1.0
7747612	APR	0.6
7747658	ART	< 0.3
7747671	BS OFFICE	< 0.3
7747648	CONFERENCE 2	1.1
7747677	CONFERENCE 3	0.6
7747617	CONFERENCE ROOM	1.8
7747613	COPY ROOM	0.9
7747674	COU	1.0
7747621	CR 1	1.0
7747638	CR 10	< 0.3
7747639	CR 11	< 0.3
7747634	CR 12B	< 0.3
7747635	CR 12C	< 0.3
7747637	CR 13B	< 0.3
7747636	CR 13C	< 0.3
7747646	CR 14	< 0.3
7747645	CR 15	0.7
7747644	CR 16	0.8
7747643	CR 17	0.6
7747642	CR 18	0.7
7747623	CR 2	1.4
7747624	CR 3	0.9
7747676	CR 30	0.7
7747666	CR 31	< 0.3
7747665	CR 32	< 0.3
7747625	CR 4	0.9
7747670	CR 40	0.6
7747669	CR 41	< 0.3
7747668	CR 42	0.5
7747667	CR 44	< 0.3
7747626	CR 5	2.1
7747627	CR 6	< 0.3
7747628	CR 7	1.2
7747629	CR 8	0.7
7747630	CR 9	< 0.3

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>South Lake Elementary School</b>		
<b>Test Period: 03/29/16-04/01/16</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7747660	ESOL 37	< 0.3
7747610	FACULTY	1.3
7747615	GENERAL OFFICE	0.7
7747656	GYM	< 0.3
7747657	GYM	< 0.3
7747614	HEALTH ROOM	1.0
7747619	IMC	1.9
7747620	IMC	1.5
7747673	ISM	0.6
7747649	K-1	< 0.3
7747650	K-2	< 0.3
7747679	K-2B	< 0.3
7747651	K-3	0.8
7747653	K-4	0.8
7747654	K-5	0.8
7747655	K-6	0.7
7747632	OFFICE 12A	< 0.3
7747672	OFFICE 13A	0.7
7747659	OFFICE 38A	< 0.3
7747663	PARENT 34	< 0.3
7747616	PRINCIPAL	2.0
7747608	R	1.0
7747607	SPT	2.4
7747618	WORK ROOM	0.9

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>South Lake Elementary School</b>		
<b>Test Period: 03/29/16-04/01/16</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7747641	D (14D STORAGE)	0.8
7747622	D (CR 1)	0.7
7747631	D (CR 9)	0.7
7747678	D (K-2)	< 0.3
7747652	D (K-3)	0.8
7747662	D (PARENT 34)	< 0.3
7747609	D (R)	0.6
7747664	FB (CR 32)	< 0.3
7747633	FB (OFFICE 12A)	< 0.3

Table Note:

\* Missing or Compromised Sample

# ATTACHMENT C

## Laboratory Analytical Results

April 8, 2016 **\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**SOUTH LAKE ELEMENTARY SCHOOL  
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7747647	14A MUSIC	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	0.5 ± 0.3	2016-04-05
7747675	14B MUSIC	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	< 0.3	2016-04-05
7747640	14D STORAGE	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.6 ± 0.3	2016-04-05
7747641	14D STORAGE	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.8 ± 0.3	2016-04-05
7747601	19	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747602	20	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747603	21	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	1.1 ± 0.3	2016-04-05
7747604	22	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	0.5 ± 0.3	2016-04-05
7747605	23	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	0.8 ± 0.3	2016-04-05
7747606	24	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747661	35	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747611	APR	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	1.0 ± 0.3	2016-04-05
7747612	APR	2016-03-29 @ 9:00 am	2016-04-01 @ 10:00 am	0.6 ± 0.2	2016-04-05
7747658	ART	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747671	BS OFFICE	2016-03-29 @ 11:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747648	CONFERENCE 2	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	1.1 ± 0.3	2016-04-05
7747677	CONFERENCE 3	2016-03-29 @ 12:00 pm	2016-04-01 @ 12:00 pm	0.6 ± 0.3	2016-04-05
7747617	CONFERENCE ROOM	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	1.8 ± 0.3	2016-04-05
7747613	COPY ROOM	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	0.9 ± 0.3	2016-04-05
7747674	COU	2016-03-29 @ 1:00 pm	2016-04-01 @ 11:00 am	1.0 ± 0.3	2016-04-05
7747621	CR 1	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	1.0 ± 0.3	2016-04-05
7747622	CR 1	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	0.7 ± 0.3	2016-04-05
7747638	CR 10	2016-03-29 @ 11:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747639	CR 11	2016-03-29 @ 11:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747634	CR 12B	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747635	CR 12C	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747637	CR 13B	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747636	CR 13C	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747646	CR 14	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747645	CR 15	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.7 ± 0.3	2016-04-05
7747644	CR 16	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.8 ± 0.3	2016-04-05
7747643	CR 17	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.6 ± 0.3	2016-04-05
7747642	CR 18	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.7 ± 0.3	2016-04-05
7747623	CR 2	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	1.4 ± 0.3	2016-04-05
7747624	CR 3	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	0.9 ± 0.3	2016-04-05
7747676	CR 30	2016-03-29 @ 12:00 pm	2016-04-01 @ 9:00 am	0.7 ± 0.3	2016-04-05
7747666	CR 31	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05

April 8, 2016 **\*\* LABORATORY ANALYSIS REPORT \*\***

Radon test result report for:  
**SOUTH LAKE ELEMENTARY SCHOOL  
 MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7747664	CR 32	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747665	CR 32	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747625	CR 4	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	0.9 ± 0.3	2016-04-05
7747670	CR 40	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.6 ± 0.3	2016-04-05
7747669	CR 41	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747668	CR 42	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.5 ± 0.3	2016-04-05
7747667	CR 44	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747626	CR 5	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	2.1 ± 0.3	2016-04-05
7747627	CR 6	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747628	CR 7	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	1.2 ± 0.3	2016-04-05
7747629	CR 8	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	0.7 ± 0.3	2016-04-05
7747630	CR 9	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747631	CR 9	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	0.7 ± 0.3	2016-04-05
7747660	ESOL 37	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747610	FACULTY	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	1.3 ± 0.3	2016-04-05
7747615	GENERAL OFFICE	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	0.7 ± 0.3	2016-04-05
7747656	GYM	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747657	GYM	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747614	HEALTH ROOM	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	1.0 ± 0.3	2016-04-05
7747619	IMC	2016-03-29 @ 10:00 am	2016-04-01 @ 9:00 am	1.9 ± 0.3	2016-04-05
7747620	IMC	2016-03-29 @ 10:00 am	2016-04-01 @ 9:00 am	1.5 ± 0.3	2016-04-05
7747673	ISM	2016-03-29 @ 11:00 am	2016-04-01 @ 11:00 am	0.6 ± 0.3	2016-04-05
7747649	K-1	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	< 0.3	2016-04-05
7747678	K-2	2016-03-29 @ 12:00 pm	2016-04-01 @ 9:00 am	< 0.3	2016-04-05
7747650	K-2	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	< 0.3	2016-04-05
7747679	K-2B	2016-03-29 @ 12:00 pm	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747651	K-3	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	0.8 ± 0.3	2016-04-05
7747652	K-3	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	0.8 ± 0.3	2016-04-05
7747653	K-4	2016-03-29 @ 11:00 am	2016-04-01 @ 9:00 am	0.8 ± 0.3	2016-04-05
7747654	K-5	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.8 ± 0.3	2016-04-05
7747655	K-6	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	0.7 ± 0.3	2016-04-05
7747632	OFFICE 12A	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747633	OFFICE 12A	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	< 0.3	2016-04-05
7747672	OFFICE 13A	2016-03-29 @ 11:00 am	2016-04-01 @ 11:00 am	0.7 ± 0.3	2016-04-05
7747659	OFFICE 38A	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747662	PARENT 34	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05
7747663	PARENT 34	2016-03-29 @ 11:00 am	2016-04-01 @ 10:00 am	< 0.3	2016-04-05



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April\*\* LABORATORY ANALYSIS  
8,  
2016 REPORT \*\*

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Radon test result report for:  
**SOUTH LAKE ELEMENTARY SCHOOL  
MAIN**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7747616	PRINCIPAL	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	2.0 ± 0.3	2016-04-05
7747608	R	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	1.0 ± 0.3	2016-04-05
7747609	R	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	0.6 ± 0.3	2016-04-05
7747607	SPT	2016-03-29 @ 9:00 am	2016-04-01 @ 11:00 am	2.4 ± 0.3	2016-04-05
7747618	WORK ROOM	2016-03-29 @ 10:00 am	2016-04-01 @ 11:00 am	0.9 ± 0.3	2016-04-05

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

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April 8, 2016 **\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:  
**OFFICE BLANKS**  
**Phase 13**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7726894	0	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05
7747563	0	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05
7747791	0	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05
7747792	0	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05

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

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April 8, 2016 **\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:  
**TRANSIT BLANKS**  
**Phase 13**

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7747741	1	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05
7747742	2	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05
7726876	3	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05
7726875	4	2016-03-29 @ 3:00 pm	2016-04-01 @ 3:00 pm	< 0.3	2016-04-05

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

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March 24, 2016 **\*\* LABORATORY ANALYSIS REPORT \*\***

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Radon test result report for:  
**MCPS**  
**Spike Sample Results**

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Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7735295	1	2016-03-18 @ 1:00 pm	2016-03-21 @ 1:00 pm	30.0 ± 2.0	2016-03-24
7735289	2	2016-03-18 @ 1:00 pm	2016-03-21 @ 1:00 pm	29.9 ± 2.0	2016-03-24
7735274	3	2016-03-18 @ 1:00 pm	2016-03-21 @ 1:00 pm	25.6 ± 1.7	2016-03-24
7735278	4	2016-03-18 @ 1:00 pm	2016-03-21 @ 1:00 pm	26.2 ± 1.8	2016-03-24
7735299	5	2016-03-18 @ 1:00 pm	2016-03-21 @ 1:00 pm	28.3 ± 1.9	2016-03-24
7735293	6	2016-03-18 @ 1:00 pm	2016-03-21 @ 1:00 pm	31.0 ± 2.0	2016-03-24

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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 174430

NOMINAL Conditions: Radon Conc 26.1 pCi/L Rel. Hum 48.8 % Temp. 79.1 F

Date Start: 3/18/16 Date Stop: 3/21/16 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 1250 Time Stop: 1250 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (6) Char. Cans Device No.'s: \_\_\_\_\_

3029154 thru 3029157, \_\_\_\_\_

3029083, 3029086 \_\_\_\_\_

FS Right

Date Start: 3/18/16 Date Stop: 3/21/16 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 1250 Time Stop: 1250 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

Device No.'s: (6) Char. Bags Device No.'s: \_\_\_\_\_

7735299, 7735293, 7735295, \_\_\_\_\_

7735274, 7735278, 7735289 \_\_\_\_\_

FS Right

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  $\mu$ R/h Elevation = 820 ft



## Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 13

Name of Schools:

1. Northwood HS
2. South Lake ES
3. Whetstone ES
4. Springbrook HS
5. Kensington Parkwood ES

---

	Date	Initials
Radon Test Kits Deployed	3/29/16	JM
Radon Test Kits Collected	4/1/16	JM
Radon Test Kits Shipped to Lab*	4/1/16	JM
Radon Test Kits Received by Lab*	4/5/16	JM

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



### MCPS RADON TESTING

#### Executive Summary: South Lake Elementary School

Date of Test Report:	3/1/2016 (Rev 1)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	70
# Rooms $\geq$ 4.0 pCi/L:	6
Low Value:	< 0.3
High Value:	7.3

Rooms with results  $\geq$  4.0 pCi/L:  
14B (7.3 pCi/L), 14A (6.6 pCi/L), 44A (5.0 pCi/L), 30 (4.9 pCi/L), 38A (4.4 pCi/L),  
40 (4.0 pCi/L)

Project Status:  
Initial testing completed; re-test needed for results  $\geq$  4.0 pCi/L.



March 1, 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 # 12146341.19

Location: South Lake Elementary School  
18201 Contour Road  
Gaithersburg, MD 20877

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 South Lake Elementary School, located at 18201 Contour Road in Gaithersburg, Maryland 20877 (subject site).

**Scope of Services:**

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon 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](http://www.montgomerycountymd.gov/dep/air/radon) or [www.epa.gov/radon](http://www.epa.gov/radon).

KCI visited the site on December 15, 2016 and deployed eighty-seven (87) 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 18, 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  $\leq 65^{\circ}$  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:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
<b><math>\geq 4.0</math> pCi/L</b>	14B	7.3
	14A	6.6
	44A	5.0
	30	4.9
	38A	4.4
	40	4.0
<b><math>&lt; 4.0</math> pCi/L</b>	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. Mouldale  
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

<b>Radon Testing Results</b>		
<b>South Lake E.S.</b>		
<b>Test Period: 12/15/15-12/18/15</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7704900	1	< 0.3
7704897	2	1.4
7704883	3	0.5
7704872	4	1.5
7704884	5	1.6
7704886	6	0.7
7704894	7	1.3
7704890	8	< 0.3
7704887	9	0.5
7704898	10	0.6
7704870	11	1.7
7704204	14	3.6
7704201	15	1.7
7704210	16	1.9
7704208	17	1.6
7704202	18	1.6
7704876	19	< 0.3
7704865	20	1.0
7704875	21	0.6
7704871	22	0.7
7704858	23	0.9
7704885	24	1.1
7704857	30	4.9
7704218	40	4.0
7704331	41	1.3
7704328	42	0.6
7704332	43	1.3
7704899	12A	0.8
7704211	12B	0.6
7704219	12C	< 0.3
7704893	13A	< 0.3
7704220	13B	< 0.3
7704216	13C	0.6
7704889	14A	6.6
7704330	14B	7.3
7704877	14C	3.2
7704203	14D	1.6
7704861	24A	2.3
7704868	27A	3.2
7704206	33 ART	3.7
7704205	33A	3.6
7704352	38 GYM	1.8
7704353	38 GYM	2.3
7704351	38A	4.4
7704214	44A	5.0
7704841	ALL PURPOSE	2.0

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>South Lake E.S.</b>		
<b>Test Period: 12/15/15-12/18/15</b>		
<b>Kit Number</b>	<b>Room / Area</b>	<b>Result</b>
7704862	ALL PURPOSE	1.7
7704851	BUILD SERV MNG	1.0
7704864	CONFERENCE #2	1.5
7704842	CONFERENCE #3	1.2
7704863	COU	0.9
7704873	FACULTY	2.3
7704856	GEN OFFICE	0.8
7704888	HEALTH ROOM	1.4
7704843	IMC	2.6
7704846	IMC	2.6
7704849	IMS	< 0.3
7704852	K2A	< 0.3
7704853	K2-B	1.0
7704850	K2-C	0.8
7704878	K-3	1.1
7704207	K-4	0.8
7704896	K-5	2.3
7704866	K-6	1.7
7704869	KINDER-1	0.8
7704854	KITCHEN	1.2
7704874	OFFICE	1.8
7704867	PRINCIPAL	1.7
7704881	R BOOK ROOM 25	0.9
7704213	STOR	1.2
7704859	STORAGE	3.0
7704845	STORAGE 2	2.2
7704860	WORK ROOM	1.8

Table Note:

\* Missing or Compromised Sample

<b>Radon Testing Results</b>		
<b>South Lake E.S.</b>		
<b>Test Period: 12/15/15-12/18/15</b>		
<b>Kit Number</b>	<b>QC Type</b>	<b>Result</b>
7704212	D (17)	1.8
7704891	D (19)	< 0.3
7704882	D (2)	1.5
7704209	D (33A)	3.6
7704342	D (38 GYM)	1.9
7704215	D (40)	3.7
7704333	D (41)	1.5
7704848	D (IMC)	2.2
7704844	D (IMS)	1.2
7704880	FB (18)	< 0.3
7704329	FB (43)	< 0.3
7704879	FB (FACULTY)	< 0.3
7704217	FB (K-4)	< 0.3
7704386	OB (OFFICE BLANK)	< 0.3

Table Note:

\* Missing or Compromised Sample



# ATTACHMENT C

## Laboratory Analytical Results

December  
31,  
2015

**LABORATORY ANALYSIS  
REPORT \*\***

Radon test result report for:  
**SOUTH LAKE E.S.**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7704900	1	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	< 0.3	2015-12-22
7704898	10	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	0.6 ± 0.3	2015-12-22
7704870	11	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.7 ± 0.3	2015-12-22
7704899	12A	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	0.8 ± 0.3	2015-12-22
7704211	12B	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	0.6 ± 0.3	2015-12-22
7704219	12C	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	< 0.3	2015-12-22
7704893	13A	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	< 0.3	2015-12-22
7704220	13B	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	< 0.3	2015-12-22
7704216	13C	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	0.6 ± 0.3	2015-12-22
7704204	14	2015-12-15 @ 9:00 am	2015-12-18 @ 8:00 am	3.6 ± 0.4	2015-12-22
7704889	14A	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	6.6 ± 0.4	2015-12-22
7704330	14B	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	7.3 ± 0.4	2015-12-22
7704877	14C	2015-12-15 @ 10:00 am	2015-12-18 @ 9:00 am	3.2 ± 0.4	2015-12-22
7704203	14D	2015-12-15 @ 9:00 am	2015-12-18 @ 8:00 am	1.6 ± 0.3	2015-12-22
7704201	15	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	1.7 ± 0.3	2015-12-22
7704210	16	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	1.9 ± 0.3	2015-12-22
7704212	17	2015-12-15 @ 10:00 am	2015-12-18 @ 9:00 am	1.8 ± 0.3	2015-12-22
7704208	17	2015-12-15 @ 10:00 am	2015-12-18 @ 9:00 am	1.6 ± 0.3	2015-12-22
7704880	18	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	< 0.3	2015-12-22
7704202	18	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.6 ± 0.3	2015-12-22
7704876	19	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7704891	19	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7704882	2	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.5 ± 0.3	2015-12-22
7704897	2	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.4 ± 0.3	2015-12-22
7704865	20	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	1.0 ± 0.3	2015-12-22
7704875	21	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	0.6 ± 0.3	2015-12-22
7704871	22	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	0.7 ± 0.3	2015-12-22
7704858	23	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	0.9 ± 0.3	2015-12-22
7704885	24	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	1.1 ± 0.3	2015-12-22
7704861	24A	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	2.3 ± 0.4	2015-12-22
7704868	27A	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	3.2 ± 0.4	2015-12-22
7704883	3	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	0.5 ± 0.3	2015-12-22
7704857	30	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	4.9 ± 0.4	2015-12-22
7704206	33 ART	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	3.7 ± 0.4	2015-12-22
7704209	33A	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	3.6 ± 0.4	2015-12-22
7704205	33A	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	3.6 ± 0.4	2015-12-22
7704342	38 GYM	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	1.9 ± 0.3	2015-12-22

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Radon test result report for:  
**SOUTH LAKE E.S.**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7704352	38 GYM	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	1.8 ± 0.3	2015-12-22
7704353	38 GYM	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	2.3 ± 0.3	2015-12-22
7704351	38A	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	4.4 ± 0.4	2015-12-22
7704872	4	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.5 ± 0.3	2015-12-22
7704215	40	2015-12-15 @ 8:00 am	2015-12-18 @ 10:00 am	3.7 ± 0.4	2015-12-22
7704218	40	2015-12-15 @ 8:00 am	2015-12-18 @ 10:00 am	4.0 ± 0.4	2015-12-22
7704331	41	2015-12-15 @ 8:00 am	2015-12-18 @ 10:00 am	1.3 ± 0.3	2015-12-22
7704333	41	2015-12-15 @ 8:00 am	2015-12-18 @ 10:00 am	1.5 ± 0.3	2015-12-22
7704328	42	2015-12-15 @ 8:00 am	2015-12-18 @ 10:00 am	0.6 ± 0.3	2015-12-22
7704329	43	2015-12-15 @ 9:00 am	2015-12-18 @ 10:00 am	< 0.3	2015-12-22
7704332	43	2015-12-15 @ 9:00 am	2015-12-18 @ 10:00 am	1.3 ± 0.3	2015-12-22
7704214	44A	2015-12-15 @ 8:00 am	2015-12-18 @ 10:00 am	5.0 ± 0.4	2015-12-22
7704884	5	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.6 ± 0.3	2015-12-22
7704886	6	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	0.7 ± 0.3	2015-12-22
7704894	7	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.3 ± 0.3	2015-12-22
7704890	8	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	< 0.3	2015-12-22
7704887	9	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	0.5 ± 0.3	2015-12-22
7704841	ALL PURPOSE	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	2.0 ± 0.3	2015-12-22
7704862	ALL PURPOSE	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	1.7 ± 0.3	2015-12-22
7704851	BUILDG SERV MANG	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	1.0 ± 0.3	2015-12-22
7704864	CONFERENCE #2	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	1.5 ± 0.3	2015-12-22
7704842	CONFERENCE #3	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	1.2 ± 0.3	2015-12-22
7704863	COU	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	0.9 ± 0.3	2015-12-22
7704873	FACULTY	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	2.3 ± 0.3	2015-12-22
7704879	FACULTY	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7704856	GEN OFFICE	2015-12-15 @ 10:00 am	2015-12-18 @ 9:00 am	0.8 ± 0.3	2015-12-22
7704888	HEALTH ROOM	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	1.4 ± 0.3	2015-12-22
7704843	IMC	2015-12-15 @ 12:00 pm	2015-12-18 @ 8:00 am	2.6 ± 0.4	2015-12-22
7704846	IMC	2015-12-15 @ 12:00 pm	2015-12-18 @ 8:00 am	2.6 ± 0.4	2015-12-22
7704848	IMC	2015-12-15 @ 12:00 pm	2015-12-18 @ 8:00 am	2.2 ± 0.4	2015-12-22
7704844	IMS	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	1.2 ± 0.3	2015-12-22
7704849	IMS	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7704878	K-3	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	1.1 ± 0.3	2015-12-22
7704217	K-4	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7704207	K-4	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	0.8 ± 0.3	2015-12-22
7704896	K-5	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	2.3 ± 0.3	2015-12-22
7704866	K-6	2015-12-15 @ 9:00 am	2015-12-18 @ 9:00 am	1.7 ± 0.3	2015-12-22

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Radon test result report for:  
**SOUTH LAKE E.S.**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7704853	K2-B	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	1.0 ± 0.3	2015-12-22
7704850	K2-C	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	0.8 ± 0.3	2015-12-22
7704852	K2A	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	< 0.3	2015-12-22
7704869	KINDER-1	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	0.8 ± 0.3	2015-12-22
7704854	KITCHEN	2015-12-15 @ 12:00 pm	2015-12-18 @ 9:00 am	1.2 ± 0.3	2015-12-22
7704874	OFFICE	2015-12-15 @ 10:00 am	2015-12-18 @ 9:00 am	1.8 ± 0.3	2015-12-22
7704867	PRINCIPAL	2015-12-15 @ 10:00 am	2015-12-18 @ 9:00 am	1.7 ± 0.3	2015-12-22
7704881	R BOOK ROOM 25	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	0.9 ± 0.3	2015-12-22
7704213	STOR	2015-12-15 @ 10:00 am	2015-12-18 @ 8:00 am	1.2 ± 0.3	2015-12-22
7704859	STORAGE	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	3.0 ± 0.4	2015-12-22
7704845	STORAGE 2	2015-12-15 @ 12:00 pm	2015-12-18 @ 10:00 am	2.2 ± 0.3	2015-12-22
7704860	WORK ROOM	2015-12-15 @ 11:00 am	2015-12-18 @ 9:00 am	1.8 ± 0.3	2015-12-22

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Radon test result report for:  
**SOUTH LAKE E.S.  
OFFICE BLANK**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7704386	OFFICE BLANK	2015-12-15 @ 3:00 pm	2015-12-18 @ 3:00 pm	< 0.3	2015-12-22

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

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Radon test result report for:  
**TRANSIT DEC 14 2015**  
**NONE**

<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
7704395	TRANSIT 1	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706508	TRANSIT 10	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706510	TRANSIT 11	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706511	TRANSIT 12	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706505	TRANSIT 13	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704371	TRANSIT 14	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706506	TRANSIT 15	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704381	TRANSIT 16	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704399	TRANSIT 17	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704390	TRANSIT 18	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704396	TRANSIT 2	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704364	TRANSIT 3	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704370	TRANSIT 4	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7704368	TRANSIT 5	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706524	TRANSIT 6	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706526	TRANSIT 7	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706518	TRANSIT 8	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16
7706516	TRANSIT 9	2015-12-13 @ 10:00 am	2015-12-15 @ 10:00 am	< 0.3	2015-12-16

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**LABORATORY ANALYSIS  
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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 µR/h Elevation = 820 ft





### Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase I

Name of Schools:

- 1. Westland M.S.
- 2. East Silver Spring E.S.
- 3. Oakland Terrace E.S.
- 4. Rocking Horse Road E.S.
- 5. Beall E.S.
- 6. South Lake E.S.
- 7. Jones Lane E.S.
- 8. Quince Orchard H.S.
- 9. Damascus E.S.
- 10. Westbrooke E.S.
- 11. Highland View E.S.
- 12. Cresthaven E.S.
- 13. Viers Mill E.S.
- 14. Smith Center
- 15. Rosemont E.S.
- 16. Ridgeview M.S.
- 17. Rockwell E.S.
- 18. Oak View E.S.
- 19. Jackson Road E.S.
- 20. Highland E.S.
- 21. Watkins Mill E.S.

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	Date	Initials
Radon Test Kits Deployed	12/15/15	KM
Radon Test Kits Collected	12/18/15	KM
Radon Test Kits Shipped to Lab*	12/18/15	KM
Radon Test Kits Received by Lab*	12/22/15	KM

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