



**MCPS RADON TESTING – EXECUTIVE SUMMARY**

Site Name	Upcounty Maintenance and Operations Service Center (Formerly Clarksburg Maintenance and Transportation Depot)
Date of Test Report	01/20/2022
Round of Testing	Initial Follow-up Post Remediation 2 Year Testing <u>5 Year Testing</u> HVAC Upgrade Window Replacement New Addition New Facility
# Rooms Tested	14
# Rooms $\geq$ 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.5 pCi/L

**Project Status**

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



January 20, 2022

Mr. Richard Cox  
Indoor Air Quality Team Leader  
Montgomery County Public Schools  
Gaithersburg, MD 20879

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

Location: Upcounty Maintenance and Operations Service Center  
13100 Shawnee Lane  
Clarksburg, MD 20871

Dear Mr. Cox:

KCI Technologies, Inc. (KCI) is pleased to submit the following report to Montgomery County Public Schools (MCPS) pursuant to completing a “short-term” 3 day radon test for Upcounty Maintenance and Operations Service Center (Formerly Clarksburg Maintenance and Transportation Depot), located at 13100 Shawnee Lane Clarksburg, MD 20871 (subject site).

**Scope of Services:**

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

KCI visited the site on December 14, 2021 and deployed eighteen (18) activated charcoal (AC) radon test kits. KCI deployed radon test kits in all frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

A floor plan map of the building with the test locations is included as Attachment A of this report.

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

KCI returned to the site on December 17, 2021 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

### **Evaluation of Testing Conditions:**

These tests represent:

- Follow-up to initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

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

KCI recorded observations of the following conditions in each room during the time of deployment and collection of the radon test kits:

- Indoor temperature,
- HVAC Operation,
- Dehumidifier operation,
- Humidifier operation,
- Ceiling fan operation, and
- Open windows or doors.

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the low 30°Fs and high temperatures ranged from the mid 50°Fs to the high 60°Fs. Maximum sustained winds ranged from 3-12 miles per hour. Average humidity was around 50% with 0.0 inches of precipitation (rain) was recorded during testing period.

### **Results:**

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

The results of the radon test analysis indicated the following:

<b>Radon Concentration</b>	<b>Room</b>	<b>Result</b>
<b>≥4.0 pCi/L</b>	None	N/A
<b>&lt;4.0 pCi/L</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) 891-1769.

Sincerely,



Tyler P. McCleaf  
Radon Measurement Provider  
#111004 RT  
KCI Technologies, Inc.

Attachments:     A- Floor Plan with Test Locations  
                      B- Table 1-3, Radon Test Summary Spreadsheets  
                      C- Laboratory Analytical Results

# ATTACHMENT A

## Floor Plan With Test Locations

# ATTACHMENT B

## Radon Test Summary Spreadsheets

**Table Notes:**

AC- Activated Charcoal

ACI- Air Check, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

OC- Quality Control

Table 1- Radon Testing Results		
Clarksburg Maintenance Depot		
Test Period: 12/14/2021-12/17/2021		
Kit Number	Room / Area	Result
9347969	PLUMBING SUPERVISORS OFFICE	0.6
9347977	ELECTRIC OFFICE	< 0.3
9347982	ASSISTANT SUPERVISORS OFFICE	0.7
9347983	ADMIN OFFICE	1.5
9347987	LOCK SHOP OFFICE	0.7
9347988	HVAC OFFICE	0.6
9347989	BOILER SHOP OFFICE	0.9
9347990	SUPERVISORS OFFICE	1
9347995	PLUMBING OFFICE	0.6
9347996	GLASS SHOP OFFICE	< 0.3
9347997	GENERAL MAINTENANCE OFFICE	< 0.3
9347998	ELECTRIC OFFICE	0.7
9347999	ELECTRIC OFFICE	< 0.3



Table 1- Radon Testing Results		
Clarksburg Transportation Depot		
Test Period: 12/14/2021-12/17/2021		
Kit Number	Room / Area	Result
9347985	PARTS ROOM OFFICE	0.8
9347986	MAIN TRANSPORTATION OFFICE	0.6
9347993	MAIN TRANSPORTATION OFFICE	0.8
9347994	MAIN TRANSPORTATION OFFICE	0.7
9348000	BRS OFFICE	< 0.3

Table 2- Radon Testing Results			
Clarksburg Maintenance Depot			
Test Period: 12/14/2021-12/17/2021			
Kit Number	QC Type	Room / Area	Result
9347977	D	Electric Office	< 0.3
9347998	FB	Electric Office	0.7
9347000	OB	OFFICE BLANK	< 0.3
9346980	TB	TRAVEL BLANK	< 0.3

Table 2- Radon Testing Results			
Clarksburg Transportation Depot			
Test Period: 12/14/2021-12/17/2021			
Kit Number	QC Type	Room / Area	Result
9347994	D	Main Transportation Office	0.7
9347986	FB	Main Transportation Office	0.6
9347000	OB	OFFICE BLANK	< 0.3
9346980	TB	TRAVEL BLANK	< 0.3





# ATTACHMENT C

## Laboratory Analytical Results

Radon test result report for:

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
9347983	ADMIN OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	1.5 ± 0.3	2021-12-20
9347982	ASSISTANT SUPERVISORS OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.7 ± 0.3	2021-12-20
9347989	BOILER SHOP OFFICE	2021-12-14 @ 11:00 am	2021-12-17 @ 9:00 am	0.9 ± 0.3	2021-12-20
9347977	ELECTRIC OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	< 0.3	2021-12-20
9347998	ELECTRIC OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.7 ± 0.3	2021-12-20
9347999	ELECTRIC OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	< 0.3	2021-12-20
9347997	GENERAL MAINTENANCE OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	< 0.3	2021-12-20
9347996	GLASS SHOP OFFICE	2021-12-14 @ 11:00 am	2021-12-17 @ 9:00 am	< 0.3	2021-12-20
9347988	HVAC OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.6 ± 0.3	2021-12-20
9347987	LOCK SHOP OFFICE	2021-12-14 @ 11:00 am	2021-12-17 @ 9:00 am	0.7 ± 0.3	2021-12-20
9347995	PLUMBING OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.6 ± 0.3	2021-12-20
9347969	PLUMBING SUPERVISORS OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.6 ± 0.3	2021-12-20
9347990	SUPERVISORS OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	1.0 ± 0.3	2021-12-20

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December 20, 2021

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

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Radon test result report for:

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<b>Kit #</b>	<b>Room Id</b>	<b>Started</b>	<b>Ended</b>	<b>pCi/L</b>	<b>Analyzed</b>
9348000	BRS OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 10:00 am	< 0.3	2021-12-20
9347986	MAIN TRANSPORTATION OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.6 ± 0.3	2021-12-20
9347993	MAIN TRANSPORTATION OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.8 ± 0.3	2021-12-20
9347994	MAIN TRANSPORTATION OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.7 ± 0.3	2021-12-20
9347985	PARTS ROOM OFFICE	2021-12-14 @ 10:00 am	2021-12-17 @ 9:00 am	0.8 ± 0.3	2021-12-20

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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 203404

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

Date Start: 12/24/21 Date Stop: 12/27/21 Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

Time Start: 0809 Time Stop: 0809 Time Start: \_\_\_\_\_ Time Stop: \_\_\_\_\_

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

9341721, 9341722

64 left

Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_ Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

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

Device No.'s: \_\_\_\_\_ Device No.'s: \_\_\_\_\_

Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_ Date Start: \_\_\_\_\_ Date Stop: \_\_\_\_\_

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

Device No.'s: \_\_\_\_\_ Device No.'s: \_\_\_\_\_

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

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December 31, 2021

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

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Radon test result report for:

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

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

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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 Kit Chain of Custody

Project Name: MCPS Radon - December 2021 Schools

Name of Schools:

1. Ewing at Cloverleaf Center
2. Bethesda Main. & Tran.
3. Clarksburg ES Annex
4. Clarksburg Main. & Tran.
5. Taylor Learning Center
6. Darnestown ES
7. Shady Grove Main. & Tran.

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	Date	Initials
Radon Test Kits Deployed	12/14/2021	JM
Radon Test Kits Collected	12/17/2021	JM
Radon Test Kits Shipped to Lab*	12/17/2021	JM
Radon Test Kits Received by Lab*	12/18/2021	JM

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