



MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Woodlin Elementary School
Date of Report	2/21/2020
Round of Testing	Initial Follow-up Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	56
# Rooms \geq 4.0 pCi/L	0
Lowest Value	<0.3 pCi/L
Highest Value	1.1 pCi/L

Project Status

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



2/21/2020

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: Woodlin Elementary School

2101 Luzerne Avenue
Silver Spring, Maryland 20910

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 Woodlin Elementary School, located at 2101 Luzerne Avenue in Silver Spring, Maryland 20910 (subject site).

SCOPE OF SERVICES

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

KCI visited the site on 1/7/2020 and deployed sixty-five activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance.

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

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

KCI returned to the site on 1/10/2020 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 National Radon Safety Board (NRSB) radon measurement provider and is a certified analytical laboratory for radon analysis (certification #ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

EVALUATION OF TESTING CONDITIONS

These tests represent:

- Follow-up to initial testing.

These tests were conducted to:

- Evaluate radon concentrations at the facility.

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

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the upper-20s and high temperatures were in the mid-50s. Maximum sustained winds ranged from 10-23 miles per hour. Average humidity was around 64%. 0.32 inches of precipitation (rain) was recorded during the testing period.

RESULTS

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

The results of the radon test analysis indicated the following:

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

Quality Control Samples	
Results of Blank Canisters:	The office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.3 pCi/L.
Adequate Laboratory Precision?	Review of the duplicate sample analysis indicates that adequate laboratory measurement precision was achieved.
Spike Sample Analysis:	The Spike sample analysis results indicate the laboratory is operating within statistical control limits.

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at 410-316-7800.

Sincerely,

Mr. Tyler P. McCleaf
Radon Measurement Provider
111004 RT

KCI Technologies, Inc.

Attachments:

A- Floor Plan with Test Locations

B - Tables 1-3, Radon Test Summary Spreadsheets

C- Laboratory Analytical Results

ATTACHMENT A

Floor Plan With Test Locations

ATTACHMENT B

Radon Test Summary Spreadsheet

Table Notes:

AC- Activated Charcoal

ACI- Air Chek, Inc.

D- Duplicate

FB- Field Blank

KCI- KCI Technologies, Inc.

OB- Office Blank

PM- Project Manager

QC- Quality Control

Table 1- Radon Testing Results		
Woodlin Elementary School		
Test Period: 1/6/2020-1/13/2020		
Kit Number	Room / Area	Result
9348101	HEALTH	< 0.3
9348102	MAIN OFFICE	< 0.3
9348103	PRINCIPAL	< 0.3
9348104	CONFERENCE	< 0.3
9348105	ASSISTANT PRINCIPAL	< 0.3
9348106	VOLUNTEER ROOM	< 0.3
9348107	28	< 0.3
9348108	29	1
9348109	30	< 0.3
9348110	31	< 0.3
9348111	31	< 0.3
9348112	KITCHEN OFFICE	< 0.3
9348113	32	< 0.3
9348114	34	< 0.3
9348115	33	< 0.3
9348116	BUILDING SERVICES	1.9
9348117	APR	0.7
9348118	APR	0.7
9348119	KITCHEN OFFICE	< 0.3
9348120	18	< 0.3
9348121	GYM	1
9348122	35	< 0.3
9348123	21	< 0.3
9348124	27	< 0.3
9348125	26	< 0.3
9348126	GYM OFFICE	1
9348127	17	< 0.3
9348128	GYM	1.1
9348129	41	< 0.3
9348130	23	< 0.3
9348131	24	< 0.3
9348132	25	< 0.3
9348133	21	< 0.3
9348134	22	< 0.3
9348135	15	< 0.3
9348136	12	< 0.3
9348137	IMC	< 0.3
9348138	19	< 0.3
9348139	22	< 0.3
9348140	20	< 0.3
9348141	IMC	< 0.3
9348142	IMC OFFICE	< 0.3

9348143	11	< 0.3
9348144	100	< 0.3
9348145	18	< 0.3
9348146	16	< 0.3
9348147	14	0.6
9348148	13	< 0.3
9348149	9	< 0.3
9348150	10	< 0.3
9348151	9	0.5
9348152	3	< 0.3
9348153	2	< 0.3
9348154	1	< 0.3
9348155	4	< 0.3
9348156	5	< 0.3
9348157	6	< 0.3
9348158	7	< 0.3
9348159	7	< 0.3
9348160	8	< 0.3
9348161	8	< 0.3
9348162	LOUNGE	< 0.3
9348163	COUNSELOR	< 0.3
9348164	COPY	< 0.3
9348165	STAFF CAFE	< 0.3
9348314	OFFICE BLANK	<0.3

Table 1- Radon Testing Results			
Woodlin Elementary School			
Test Period: 1/6/2020-1/13/2020			
Kit Number	QC Type	Room / Area	Result
9348110	D	31	<0.3
9348119	FB	KITCHEN OFFICE	<0.3
9348122	D	35	<0.3
9348139	D	22	<0.3
9348120	FB	18	<0.3
9348127	D	17	<0.3
9348151	D	9	0.5
9348159	FB	7	<0.3
9348160	D	8	<0.3
9348319	TRANSIT BLANK	NA	<0.3
9348320	TRANSIT BLANK	NA	<0.3
9348313	TRANSIT BLANK	NA	<0.3

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:

MCPS - Spike Sample Lab Results. Measured values are satisfactory, i.e., within $\pm 25\%$ of the chamber's reference value (25.7 pCi/L).

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

Radon test result report for:

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

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

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
9340052	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.4 \pm 2.6 D	2020-01-03
9340057	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	27.3 \pm 2.5 D	2020-01-03
9340025	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.1 \pm 2.4 D	2020-01-03
9341711	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	22.5 \pm 2.2 D	2020-01-03
9340079	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	26.9 \pm 2.5 D	2020-01-03
9340062	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.6 \pm 2.5 D	2020-01-03
9340030	N/A	2019-12-21 @ 8:00 am	2019-12-23 @ 8:00 am	25.0 \pm 2.4 D	2020-01-03
9341716	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	25.1 \pm 2.4 D	2020-01-03
9340084	N/A	2019-12-21 @ 9:00 am	2019-12-23 @ 9:00 am	24.5 \pm 2.3 D	2020-01-03

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 193598

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

Date Start: 12/21/19 Date Stop: 12/23/19
Time Start: 0830 Time Stop: 0830
(Group 4)
Device No.'s: (20) Char. Bags -
9340061 thru 9340080

Temp of _____ F
RH % 50.1
Avg pCi/L 25.5

52

Date Start: 12/21/19 Date Stop: 12/23/19
Time Start: 0835 Time Stop: 0835
(Group 5)
Device No.'s: (20) Char. Bags -
9340081 thru 9340100

Temp of _____ F
RH % 50.1
Avg pCi/L 25.5

25

Date Start: 12/21/19 Date Stop: 12/23/19
Time Start: 0840 Time Stop: 0840
(Group 6)
Device No.'s: (20) Char. Bags -
9341701 thru 9341720

Temp of _____ F
RH % 50.1
Avg pCi/L 25.5

25

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

P4792 / WILLIAM LYMAN

Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
9348101	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		HEALTH		1	< 0.3
9348102	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		MAIN OFFICE		1	< 0.3
9348103	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		PRINCIPAL		1	< 0.3
9348104	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		CONFERENCE		1	< 0.3
9348105	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		ASSISTANT PRINCIPAL		1	< 0.3
9348106	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		VOLUNTEER ROOM		1	< 0.3
9348107	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		28		1	< 0.3
9348108	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		29		1	1.0
9348109	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		30		1	< 0.3
9348110	2020-01-06	11:00 am	2020-01-13	11:00 am	72	WOODLIN ES		31		1	< 0.3
9348111	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		31		1	< 0.3
9348112	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		KITCHEN OFFICE		1	< 0.3
9348113	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		32		1	< 0.3
9348114	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		34		1	< 0.3
9348115	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		33		1	< 0.3
9348116	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		BUILDING SERVICES		1	1.9
9348117	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		APR		1	0.7
9348118	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		APR		1	0.7
9348119	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		KITCHEN OFFICE		1	< 0.3
9348120	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		18		1	< 0.3
9348121	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		GYM		1	1.0
9348122	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		35		1	< 0.3
9348123	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		21		1	< 0.3
9348124	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		27		1	< 0.3
9348125	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		26		1	< 0.3
9348126	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		GYM OFFICE		1	1.0
9348127	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		17		1	< 0.3
9348128	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		GYM		1	1.1
9348129	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		41		1	< 0.3
9348130	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		23		1	< 0.3
9348131	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		24		1	< 0.3
9348132	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		25		1	< 0.3
9348133	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		21		1	< 0.3
9348134	2020-01-06	12:00 pm	2020-01-13	11:00 am	72	WOODLIN ES		22		1	< 0.3
9348135	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		15		1	< 0.3

P4792 / WILLIAM LYMAN

Kit Number	Start Date	Start Time	End Date	End Time	Temp.	Facility	Building	Room	Project ID	Floor	Result
9348136	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		12		1	< 0.3
9348137	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		IMC		1	< 0.3
9348138	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		19		1	< 0.3
9348139	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		22		1	< 0.3
9348140	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		20		1	< 0.3
9348141	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		IMC		1	< 0.3
9348142	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		IMC OFFICE		1	< 0.3
9348143	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		11		1	< 0.3
9348144	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		100		1	< 0.3
9348145	2020-01-06	1:00 pm	2020-01-13	12:00 pm	72	WOODLIN ES		18		1	< 0.3
9348146	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		16		1	< 0.3
9348147	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		14		1	0.6
9348148	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		13		1	< 0.3
9348149	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		9		1	< 0.3
9348150	2020-01-06	1:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		10		1	< 0.3
9348151	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		9		1	0.5
9348152	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		3		1	< 0.3
9348153	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		2		1	< 0.3
9348154	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		1		1	< 0.3
9348155	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		4		1	< 0.3
9348156	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		5		1	< 0.3
9348157	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		6		1	< 0.3
9348158	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		7		1	< 0.3
9348159	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		7		1	< 0.3
9348160	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		8		1	< 0.3
9348161	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		8		1	< 0.3
9348162	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		LOUNGE		1	< 0.3
9348163	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		COUNSELOR		1	< 0.3
9348164	2020-01-06	2:00 am	2020-01-13	12:00 pm	72	WOODLIN ES		COPY		1	< 0.3
9348165	2020-01-06	2:00 am	2020-01-13	1:00 pm	72	WOODLIN ES		STAFF CAFE		1	< 0.3



Radon Test Kit Chain of Custody

Project Name: MCPS Radon 2019 Week 3

Name of Schools:

- | | |
|------------------------------|----------------------------|
| 1. Bannockburn E.S. | 12. Montgomery Knolls E.S. |
| 2. Bethesda E.S. | 13. Newport Mills M.S. |
| 3. Bethesda-Chevy Chase H.S. | 14. Oak View E.S. |
| 4. Bradley Hill E.S. | 15. Rock View E.S. |
| 5. Burning Tree E.S. | 16. Roscoe Nix E.S. |
| 6. Burnt Mills E.S. | 17. Sligo M.S. |
| 7. East Silver Springs E.S. | 18. Spring Mill Center |
| 8. Einstein H.S. | 19. Springbrook H.S. |
| 9. Flora Singer E.S. | 20. Westland M.S. |
| 10. Key M.S. | 21. Woodlin E.S. |
| 11. Montgomery Blair H.S. | |

	Date	Initials
Radon Test Kits Deployed	1/6/20 to 1/7/20	JM
Radon Test Kits Collected	1/9/20 to 1/10/20	JM
Radon Test Kits Shipped to Lab*	1/10/20	JM
Radon Test Kits Received by Lab*	1/13/202	JM

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



MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Woodlin Elementary School
Date of Report	March 14, 2018
Round of Testing	Initial Follow-up Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	2
# Rooms \geq 4.0 pCi/L	0
Lowest Value	0.9 pCi/L
Highest Value	1.6 pCi/L

Project Status

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



March 14, 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: Woodlin Elementary School

2101 Luzerne Ave.
Silver Spring, Maryland 20910

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 Woodlin Elementary School, located at 2101 Luzerne Ave. in Silver Spring, Maryland 20910 (subject site).

SCOPE OF SERVICES

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on February 12, 2018 and deployed four (4) 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. ≥ 3.5 pCi/L).

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 15, 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 mid-20s to upper 40s and high temperatures ranged from the high-30s to the high-60s. Maximum sustained winds ranged from 10-15 miles per hour. Average humidity was around 69%. 0.05 Inches of precipitation was recorded during the testing period.

RESULTS

The sampling locations and analytical results are listed on Table 1 (Attachment B). The quality control sample locations and analytical results are listed on Table 2 (Attachment B). 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,



Radon Measurement Specialist
KCI Technologies, Inc.

Attachments:

- A- Floor Plan with Test Locations
- 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

Table 1 - Radon Testing Results		
Woodlin Elementary School		
Test Period: 02/12/18-02/15/18		
Kit Number	Room / Area	Result
7986776	CAFE	1.4
7986775	CAFE	1.4
7986778	KITCHEN	0.9

Table Note:

* Missing or Compromised Sample

Table 2 - Radon Testing Results		
Woodlin Elementary School		
Test Period: 02/12/18-02/15/18		
Kit Number	QC Type	Result
7986779	D (CAFE)	1.6

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

February 27, 2018

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**WOODLIN ES
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7986779	CAFE	2018-02-12 @ 3:00 pm	2018-02-15 @ 1:00 pm	1.6 ± 0.3	2018-02-19
7986775	CAFE	2018-02-12 @ 3:00 pm	2018-02-15 @ 1:00 pm	1.4 ± 0.3	2018-02-19
7986776	CAFE	2018-02-12 @ 3:00 pm	2018-02-15 @ 1:00 pm	1.4 ± 0.3	2018-02-19
7986778	KITCHEN	2018-02-12 @ 3:00 pm	2018-02-15 @ 1:00 pm	0.9 ± 0.3	2018-02-19

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



Radon Test Kit Chain of Custody

Project Name: MCPS Radon

Names of Schools:

1. Highland Elementary School
2. Stephen Knolls Elementary School
3. Silver Creek Middle School
4. Woodlin Elementary School
5. Sligo Creek Elementary School
6. Francis Scott Key Middle School
7. John T. Baker Middle School
8. Cedar Grove Elementary School
9. Clarksburg Elementary School
10. Clarksburg Elementary School Annex
11. Fields Road Elementary School
12. Dufief Elementary School
13. Brown Station Elementary School
14. Diamond Elementary School
15. Fallsmeade Elementary School
16. Thomas Whootton High School
17. Lake Seneca Elementary School
18. Redland Middle School
19. Newport Mill Middle School
20. Bethesda Trans. and Maint. Depot
21. Sequoyah Elementary School
22. Gaithersburg Middle School
23. Wayside Elementary School
24. Travilah Elementary School
25. Damascus High School
26. Jones Lane Elementary School
27. Greencastle Elementary School
28. Spring Brook High School
29. Montgomery Blair High School
30. Watkins Mill High School

	Date	Initials
Radon Test Kits Deployed	2/12/18	JM
Radon Test Kits Collected	2/15/18	JM
Radon Test Kits Shipped to Lab*	2/15/18	JM
Radon Test Kits Received by Lab*	2/19/15	JM

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

Radon test result report for:
OFFICE BLANKS

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

February 28, 2018

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS - Spike Sample Laboratory Results. Measured values are satisfactory, i.e. within $\pm 25\%$ of the chamber's reference value (20.9 pCi/L).

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

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

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

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

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



MCPS RADON TESTING - EXECUTIVE SUMMARY

Site Name	Woodlin Elementary School
Date of Report	January 30, 2018
Round of Testing	Initial Follow-up Post Remediation 2 year testing 5 year testing HVAC Upgrade Window Replacement New Addition New Facility
# of Rooms Tested	51
# Rooms \geq 4.0 pCi/L	0
Lowest Value	< 0.3 pCi/L
Highest Value	3.7 pCi/L

Project Status

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



January 30, 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: Woodlin Elementary School

2101 Luzerne Ave.
Silver Spring, Maryland 20910

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 Woodlin Elementary School, located at 2101 Luzerne Ave. in Silver Spring, Maryland 20910 (subject site).

SCOPE OF SERVICES

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on November 27, 2017 and deployed sixty-five (65) 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 November 30, 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:

- 2 year 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 30s and high temperatures ranged from the low-50s to mid-60s. Maximum sustained winds ranged from 8-15 miles per hour. Average humidity was around 65%. 0.02 Inches of precipitation was recorded during the testing period.

A magnitude 4.1 earthquake was reported on Thursday, November 30 near Dover, Delaware approximately 95 miles east of Gaithersburg, Maryland. The earthquake occurred during or just after the radon testing period for this facility. In general, enhanced radon emissions have been observed prior to earthquakes and this has been recorded all over the world, according to the research article entitled *Radon-222: A Potential Short-Term Earthquake Precursor*, published June 30, 2015 in the Journal of Earth Science and Climate

Change. The nearby earthquake, which occurred during or prior to the testing period, may have resulted in higher-than-normal radon test results for this facility.

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:

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

Quality Control Samples	
Results of Blank Canisters:	The field 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 Mouldsdales, 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		
Woodlin Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	Room / Area	Result
7976949	1	0.8
7976929	2	0.7
7976937	3	0.6
7976930	4	1.5
7976934	5	0.9
7976950	6	1.0
7976941	7	< 0.3
7976940	8	0.7
7976948	9	1.3
7976959	10	0.9
7976957	11	1.6
7976956	12	1.4
7976955	13	1.1
7976954	14	1.1
7976951	15	1.4
7976953	16	1.4
7976967	17	1.0
7976963	18	0.9
7976961	19	1.3
7976960	20	1.9
7976971	21	0.7
7976976	22	0.6
7976977	23	1.2
7976978	24	0.6
7976972	25	0.6
7976968	26	2.4
7976995	28	2.3
7977000	29	2.2
7976984	30	1.1
7976985	31	1.1
7976986	32	0.7
7976988	33	0.7
7976989	34	0.9
7976974	35	0.9
7976958	100	1.2
7976992	ASSISTANT PRINCIPAL	1.0
7976990	BUILDING SERV	3.7
7976983	* CAFE (Open Door)	1.3
7976980	* CAFE (Open Door)	1.1
7976944	COUNSLER	< 0.3
7976973	GYM	2.8
7976982	GYM	2.3
7976979	GYM OFFICE	3.3
7976997	HEALTH	0.9
7976964	LIBRARY MID OFFICE	0.7
7976966	LIBRARY S. OFFICE	< 0.3

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Woodlin Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	Room / Area	Result
7976965	LIBRARY	0.7
7976993	MAIN OFFICE	1.2
7976991	OFFICE CONFERENCE	0.8
7976998	PRINCIPAL OFFICE	1.2
7976946	STAFF LOUNGE 1	1.1
7976947	STAFF LOUNGE 2	0.8
7976945	WORK ROOM	1.0

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Woodlin Elementary School		
Test Period: 11/27/17-11/30/17		
Kit Number	QC Type	Result
7976952	D (17)	1.0
7976962	D (19)	1.0
7976969	D (26)	2.4
7976996	D (29)	3.2
7976987	D (33)	0.8
7976975	D (35)	0.8
7976999	D (PRINCIPAL OFFICE)	0.6
7976943	FB (1)	< 0.3
7976981	FB (29)	< 0.3
7976970	FB (35)	< 0.3
7976994	FB (OFFICE CONFERENCE)	< 0.3
7977270	OB (OFFICE BLANK)	< 0.3

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

Radon test result report for:**WOODLINES
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7976949	1	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	0.8 ± 0.4	2017-12-05
7976943	1	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	< 0.3	2017-12-05
7976959	10	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	0.9 ± 0.4	2017-12-05
7976958	100	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.2 ± 0.4	2017-12-05
7976957	11	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.6 ± 0.4	2017-12-04
7976956	12	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.4 ± 0.4	2017-12-05
7976955	13	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.1 ± 0.3	2017-12-04
7976954	14	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.1 ± 0.4	2017-12-05
7976951	15	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.4 ± 0.4	2017-12-05
7976953	16	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.4 ± 0.4	2017-12-05
7976967	17	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	1.0 ± 0.4	2017-12-05
7976952	17	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.0 ± 0.4	2017-12-05
7976963	18	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	0.9 ± 0.4	2017-12-05
7976961	19	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	1.3 ± 0.4	2017-12-05
7976962	19	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	1.0 ± 0.4	2017-12-05
7976929	2	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	0.7 ± 0.3	2017-12-04
7976960	20	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	1.9 ± 0.4	2017-12-05
7976971	21	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.7 ± 0.4	2017-12-04
7976976	22	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.6 ± 0.3	2017-12-04
7976977	23	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	1.2 ± 0.4	2017-12-04
7976978	24	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.6 ± 0.4	2017-12-05
7976972	25	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.6 ± 0.4	2017-12-05
7976968	26	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	2.4 ± 0.4	2017-12-04
7976969	26	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	2.4 ± 0.5	2017-12-05
7976995	28	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	2.3 ± 0.4	2017-12-04
7976981	29	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	< 0.3	2017-12-04
7977000	29	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	2.2 ± 0.4	2017-12-04
7976996	29	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	3.2 ± 0.4	2017-12-04
7976937	3	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	0.6 ± 0.4	2017-12-05
7976984	30	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	1.1 ± 0.4	2017-12-04
7976985	31	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	1.1 ± 0.4	2017-12-04
7976986	32	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.7 ± 0.3	2017-12-04
7976987	33	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.8 ± 0.3	2017-12-04
7976988	33	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.7 ± 0.4	2017-12-04
7976989	34	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.9 ± 0.4	2017-12-05
7976975	35	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.8 ± 0.4	2017-12-04
7976970	35	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	< 0.3	2017-12-04

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

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7976974	35	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	0.9 ± 0.4	2017-12-05
7976930	4	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.5 ± 0.4	2017-12-05
7976934	5	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	0.9 ± 0.4	2017-12-05
7976950	6	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.0 ± 0.4	2017-12-05
7976941	7	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	< 0.3	2017-12-05
7976940	8	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	0.7 ± 0.3	2017-12-04
7976948	9	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.3 ± 0.4	2017-12-05
7976992	ASSISTANT PRINCIPAL	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	1.0 ± 0.4	2017-12-04
7976990	BUILDING SERV	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	3.7 ± 0.4	2017-12-04
7976980	CAFE	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	1.1 ± 0.3	2017-12-04
7976983	CAFE	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	1.3 ± 0.4	2017-12-05
7976944	COUNSLER	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	< 0.3	2017-12-05
7976982	GYM	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	2.3 ± 0.4	2017-12-04
7976973	GYM	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	2.8 ± 0.4	2017-12-05
7976979	GYM OFFICE	2017-11-27 @ 1:00 pm	2017-11-30 @ 9:00 am	3.3 ± 0.4	2017-12-04
7976997	HEALTH	2017-11-27 @ 12:00 pm	2017-11-30 @ 10:00 am	0.9 ± 0.4	2017-12-05
7976964	LIB MID OFFICE	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	0.7 ± 0.4	2017-12-05
7976966	LIB S OFFICE	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	< 0.3	2017-12-05
7976965	LIBRARY	2017-11-27 @ 1:00 pm	2017-11-30 @ 10:00 am	0.7 ± 0.4	2017-12-05
7976993	MAIN OFFICE	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	1.2 ± 0.4	2017-12-04
7977270	OFFICE BLANK	2017-11-27 @ 3:00 pm	2017-11-30 @ 3:00 pm	< 0.3	2017-12-05
7976994	OFFICE CONFERENCE	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	< 0.3	2017-12-05
7976991	OFFICE CONFERENCE	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	0.8 ± 0.4	2017-12-05
7976998	PRINCIPAL OFFICE	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	1.2 ± 0.4	2017-12-04
7976999	PRINCIPAL OFFICE	2017-11-27 @ 12:00 pm	2017-11-30 @ 9:00 am	0.6 ± 0.3	2017-12-04
7976946	STAFF LOUNGE 1	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.1 ± 0.3	2017-12-04
7976947	STAFF LOUNGE 2	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	0.8 ± 0.4	2017-12-05
7976945	WORK ROOM	2017-11-27 @ 2:00 pm	2017-11-30 @ 10:00 am	1.0 ± 0.4	2017-12-05



Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase

Names of Schools:

- | | |
|--|---------------------------------------|
| 1. Montgomery Knolls Elementary School | 14. Flora Singer Elementary School |
| 2. New Hampshire Estates Elementary School | 15. Sligo Middle School |
| 3. Montgomery Blair High School | 16. Mario Loiederman Middle School |
| 4. Silver Creek Middle School | 17. Roscoe Nix Elementary School |
| 5. Sligo Creek Elementary School | 18. Sargent Shriver Elementary School |
| 6. East Silver Spring Elementary School | 19. |
| 7. Silver Spring International Middle School | 20. |
| 8. Woodlin Elementary School | 21. |
| 9. Northwood High School | 22. |
| 10. Spring Mill Center | 23. |
| 11. Westbrook Elementary School | 24. |
| 12. Westland Middle School | 25. |
| 13. Cloverly Elementary School | 26. |

	Date	Initials
Radon Test Kits Deployed	11/27/17	JM
Radon Test Kits Collected	11/30/17	JM
Radon Test Kits Shipped to Lab*	11/30/17	JM
Radon Test Kits Received by Lab*	12/04/17	JM

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

Radon test result report for:**TRANSIT 1****NONE**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7978062	TRANSIT 1	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975804	TRANSIT 10	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7977990	TRANSIT 11	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978201	TRANSIT 12	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978203	TRANSIT 13	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978206	TRANSIT 14	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978246	TRANSIT 15	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978239	TRANSIT 16	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978226	TRANSIT 17	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7975078	TRANSIT 18	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7975077	TRANSIT 19	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978074	TRANSIT 2	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975076	TRANSIT 20	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975684	TRANSIT 21	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975683	TRANSIT 22	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975601	TRANSIT 23	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978011	TRANSIT 24	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978012	TRANSIT 25	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978094	TRANSIT 26	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7975624	TRANSIT 27	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7834562	TRANSIT 28	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7977995	TRANSIT 29	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978098	TRANSIT 3	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7977992	TRANSIT 30	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978719	TRANSIT 4	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-05
7978732	TRANSIT 5	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7978731	TRANSIT 6	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975806	TRANSIT 7	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975815	TRANSIT 8	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04
7975805	TRANSIT 9	2017-11-27 @ 4:00 pm	2017-11-30 @ 4:00 pm	< 0.3	2017-12-04

December 19, 2017

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

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

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

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

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 182393

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

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

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

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

7975075, 7975064, 7975063, _____

7975065, 7975069, 7975070 _____

F4 Right

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

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



MCPS RADON TESTING

Executive Summary: Woodlin Elementary School

Date of Test Report:	10/20/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	8
# Rooms \geq 4.0 pCi/L:	0
Low Value:	< 0.3
High Value:	0.8

Project Status:

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



October 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 # 12146341.54

Location: Woodlin Elementary School
2101 Luzerne Avenue
Silver Spring, MD 20910

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 Woodlin Elementary School, located at 2101 Luzerne Avenue in Silver Spring, Maryland 20910 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on September 26, 2016 and deployed ten (10) activated charcoal (AC) radon test kits. KCI deployed radon test kits in frequently-occupied ground contact rooms, and other areas, (if applicable) in accordance with AARST guidance. A floor plan map of the building with the test locations is included as Attachment A of this report.

As a quality control measure, KCI included duplicate samples, field blanks, lab transit blanks, and office blanks in accordance with AARST recommendations. In addition, KCI submitted six (6) test kits to Bowser-Morner, Inc. as spike samples. The spiked tests were exposed to a known radon concentration by Bowser-Morner prior to being returned to the laboratory for analysis.

KCI returned to the site on September 29, 2016 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936 Butler Bridge Road, Mills River, North Carolina.

Evaluation of Testing Conditions:

These tests represent:

- Post-mitigation testing for radon mitigation systems installed recently.

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

- Confirm the success of the mitigation system(s).

Future periodic testing should be conducted during the heating season in ideal conditions as described below. According to AARST, *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*, ideal testing conditions would be when the building is fully occupied and the heating system is active. For this test, the facility's HVAC system was operating in cooling mode; therefore, KCI concludes that this test was not conducted during ideal testing conditions.

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

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

KCI also compiled weather data for the testing period and conducted observations of relevant field conditions. During the test period, weather records indicate low temperatures were in the 50s and high temperatures in the mid-60s to mid-70s. Maximum sustained winds ranged from 3-15 miles per hour. Average humidity ranged from 71 to 89 percent. Rain (1.83 inches in Gaithersburg, MD) was recorded on 9/29/16. The weather conditions during the testing period may have resulted in atypical radon test results for this facility.

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥4.0 pCi/L	none	n/a
<4.0 pCi/L	See Attachment B	

Notes:

D- Duplicate sample

The field blank, lab transit blanks, and office 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

Radon Testing Results		
Woodlin Elementary School		
Test Period: 09/27/16-09/30/16		
Kit Number	Room / Area	Result
7802373	4	0.6
7802367	5	0.6
7802371	10	0.8
7802369	11	< 0.3
7802350	12	0.7
7802357	13	0.8
7802372	14	< 0.3
7802376	100	< 0.3

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Woodlin Elementary School		
Test Period: 09/27/16-09/30/16		
Kit Number	QC Type	Result
7802375	D (100)	0.6
7802370	FB (100)	< 0.3

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

October 7, 2016

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

**WOODLIN ELEMENTARY SCHOOL
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7802371	10	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	0.8 ± 0.2	2016-10-03
7802375	100	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	0.6 ± 0.2	2016-10-03
7802376	100	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	< 0.3	2016-10-03
7802370	100	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	< 0.3	2016-10-03
7802369	11	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	< 0.3	2016-10-03
7802350	12	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	0.7 ± 0.2	2016-10-03
7802357	13	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	0.8 ± 0.2	2016-10-03
7802372	14	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	< 0.3	2016-10-03
7802373	4	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	0.6 ± 0.2	2016-10-03
7802367	5	2016-09-27 @ 12:00 pm	2016-09-30 @ 1:00 pm	0.6 ± 0.2	2016-10-03

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

October 7, 2016

**** LABORATORY ANALYSIS REPORT ****

Radon test result report for:

MCPS Radon

Phase 18 Office Blanks

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

Radon test result report for:

MCPS Radon**Phase 18 Transit Blanks**

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

October 12, 2016

**** LABORATORY ANALYSIS REPORT ****

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

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

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

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

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 176788

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

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

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

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

7769899, 7769884, 7769885, _____

7769889, 7769890, 7769891 _____

F3 Left

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

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



Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 18

Name of Schools:

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

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

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



Radon Test Kit Chain of Custody

Project Name: MCPS Radon Phase 18

Name of Schools:

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

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

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



MCPS RADON TESTING

Executive Summary: Woodlin Elementary School

Date of Test Report:	3/24/2016
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	8
# Rooms \geq 4.0 pCi/L:	0
Low Value:	0.5
High Value:	1.6

Project Status:

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



March 24, 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 # 12146341.30

Location: Woodlin Elementary School
2101 Luzerne Avenue
Silver Spring, MD 20910

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 Woodlin Elementary School, located at 2101 Luzerne Avenue in Silver Spring, Maryland 20910 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on February 29, 2016 and deployed eleven (11) 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 March 3, 2016 to retrieve the radon sampling test kits. KCI shipped all radon tests to Accustar Labs for analysis by gamma-ray spectroscopy. Accustar Labs is a NRSB certified analytical laboratory for radon analysis (certification # ARL0007) located at 929 Mount Zion Road,

Lebanon, Pennsylvania.

Evaluation of Testing Conditions:

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

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

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

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

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥ 4.0 pCi/L	none	n/a
< 4.0 pCi/L	See Attachment B	

Notes:
D- Duplicate sample

The field blank, office blanks, and lab transit blanks had test results of less than the laboratory detection limit of 0.4 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 10 testing. Office blanks were not submitted under each school individually.

Radon Testing Results		
Woodlin Elementary School		
Test Period: 02/29/16-03/03/16		
Kit Number	Room / Area	Result
3028857	4	0.8
3028858	11	1.0
3028856	* 100 (Missing)	-
3028864	APR	0.9
3028863	* APR (Tampered)	0.8
3028862	ASST PRINC.	0.6
3028865	GYM	1.1
3028866	GYM	1.6
3028861	STAFF LOUNGE 2	0.5

Table Note:

* Missing or Compromised Sample

Radon Testing Results		
Woodlin Elementary School		
Test Period: 02/29/16-03/03/16		
Kit Number	QC Type	Result
3028860	D (STAFF LOUNGE 2)	<0.4
3028859	FB (STAFF LOUNGE 2)	<0.4

Table Note:

* Missing or Compromised Sample

ATTACHMENT C

Laboratory Analytical Results

NRPP 10511AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 12146341

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152


Woodlin ES
2101 Luzerne Avenue
Silver Spring MD 20910


Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3015343	3028858	02/29/2016 2:31 pm	03/03/2016 8:34 am	11	1.0
3015344	3028857	02/29/2016 2:37 pm	03/03/2016 8:33 am	4	0.8
3015345	3028859	02/29/2016 2:44 pm	03/03/2016 8:29 am	Staff Lounge 2	<0.4
3015346	3028860	02/29/2016 2:44 pm	03/03/2016 8:29 am	Staff Lounge 2	<0.4
3015347	3028861	02/29/2016 2:44 pm	03/03/2016 8:29 am	Staff Lounge 2	0.5
3015348	3028862	02/29/2016 2:50 pm	03/03/2016 8:29 am	Asst. Principal	0.6
3015349	3028863	02/29/2016 2:58 pm	03/03/2016 8:21 am	APR	0.8
3015350	3028864	02/29/2016 2:58 pm	03/03/2016 8:17 am	APR	0.9
3015351	3028865	02/29/2016 3:05 pm	03/03/2016 8:27 am	Gym	1.1
3015352	3028866	02/29/2016 3:05 pm	03/03/2016 8:27 am	Gym	1.6

Comment: A copy of this report was emailed to tehsin@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 03/07/2016 Date Logged: 03/07/2016 Date Analyzed: 03/07/2016 Date Reported: 03/08/2016

Report Reviewed By: 

Report Approved By: 
Carolyn D. Koke, President, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is +/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.



AccuStar Labs
11 Awl Street
Medway MA 02053

888-480-8812
www.accustarlabs.com

Radon Device Type Open Face Canister

Send Written Report To:

Name: KCI Technologies, Inc
 Address: 936 Ridgebrook Road
 Address:
 City / Town: Sparks
 State/Province Postal Code: MD 21152
 Report Country: Baltimore County
 Email Address: tehsin@kci.com

Site Tested:

Site Name: Woodlin Es
 Address: 2101 LUTEME AVE.
 Address:
 City / Town: SILVER SPRING
 State/Province Postal Code: MD 20910
 Test Country: Montgomery County
 Project Number: 12146341

Contact Information:

Contact: Tehsin Aurangabadwala
 Telephone: 410-891-1726
 Technician: Atm I,
 Cert. Number:
 Signature:

Lab Use Only	Device Number	Building Number	Unit Number	Floor	Name of Room	Start Date mm/dd/yyyy	Start Time hh:mm am / pm	Stop Date mm/dd/yyyy	Stop Time hh:mm am / pm	Lab Use Only
	3028856		100 (SR-229)		Temp 70°	02/29/2016	2:28 pm	03/03/2016	Missing	
	3028858		11 (SR-224)		70°	02/29/2016	2:31 pm	03/03/2016	8:34 AM	
	3028857		4 (OR-221)		70°	02/29/2016	2:37 pm	03/03/2016	8:33 AM	
	3028859		Staff-210		70°	02/29/2016	2:44 pm	03/03/2016	8:29 AM	
	3028860		Staff-210		70°	02/29/2016	2:44 pm	03/03/2016	8:29 AM	
	3028861		Staff-210		70°	02/29/2016	2:44 pm	03/03/2016	8:29 AM	
	3028862		20 (STO-248)		70°	02/29/2016	2:50 pm	03/03/2016	8:29 AM	
	3028863		APP-(NPR-136)		Cafe 76°	02/29/2016	2:58 pm	03/03/2016	8:21 AM	
	3028864		APP-(NPR-136)		Cafe 70°	02/29/2016	2:58 pm	03/03/2016	8:17 AM	
	3028865		108- gym		Gym 70°	02/29/2016	3:05 pm	03/03/2016	8:27 AM	

3028866

108- gym

70°

7/29/16

3:05 pm

Test must start before the expiration date shown on your device or test results will be invalid

NRPP 10511AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested: Project # 12146341

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152

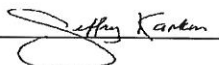
MCPS Radon Phase 10 Office Blank

Log Number	Device Number	Test Exposure Duration:	Area Tested	Result (pCi/L)
3015360	3028828	02/29/2016 9:30 am 03/03/2016 9:30 am	Office Blank	<0.4

Comment: A copy of this report was emailed to tehsin@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 03/07/2016 Date Logged: 03/07/2016 Date Analyzed: 03/08/2016 Date Reported: 03/08/2016

Report Reviewed By: 

Report Approved By: 
Carolyn D. Koke, President, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is +/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

Send Written Report To:

Name KCI Technologies, Inc
 Address 936 Ridgebrook Road
 Address
 City / Town Sparks
 State/Province Postal Code MD 21152
 Report Country Baltimore County
 Email Address fehsein@kci.com

Site Tested:

Site Name KCI OFFICE
 Address 936 Ridgebrook Road
 Address
 City / Town Sparks
 State/Province Postal Code MD 21152
 Test Country Montgomery County
 Project Number 12146341

Contact Information:

Contact Tehsin Aurangabadwala
 Telephone 410-891-1726
 Technician
 Cert. Number
 Signature

Lab Use Only	Device Number	Building Number	Unit Number	Floor	Name of Room	Start Date mm/dd/yyyy	Start Time hh:mm am / pm	Stop Date mm/dd/yyyy	Stop Time hh:mm am / pm	Lab Use Only
	3028828		0	1	OFFICE (TEMP - 70F)	02/29/2016	9:30 am	03/03/2016	9:30 am	

NRPP 10511AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested:

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152

MCPS
Transit Blanks

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3010588	3028953	01/19/2016 1:00 pm	01/22/2016 9:30 am	1	< 0.4
3010589	3028955	01/19/2016 1:00 pm	01/22/2016 9:30 am	2	< 0.4
3010590	3028954	01/19/2016 1:00 pm	01/22/2016 9:30 am	3	< 0.4
3010591	3028997	01/19/2016 1:00 pm	01/22/2016 9:30 am	4	< 0.4

Comment: AMENDED REPORT for 3028953-8955, 3028997 on 2/22/16 to add all missing information from the blank datasheet. A copy of this report was emailed to james.mouldsdales@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 01/27/2016 Date Logged: 01/27/2016 Date Analyzed: 01/28/2016 Date Reported: 01/28/2016

Report Reviewed By: Christie Bates

Report Approved By: Carolyn D. Koke

Carolyn D. Koke, President, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is +/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

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Return canisters for analysis to:
AccuStar Labs
 929 Mt. Zion Rd., Lebanon, PA 17046
 800-523-4964

RECEIVED JAN 27 2016
AccuStar Labs - Lebanon, PA
INFORMATION FORM - Large Buildings -
Projects - Apartments

Instructions on back of form
 Read instructions carefully
 Discrepancies will invalidate tests

Test Site Info

Name of Building/Project or Owner: Transit
 Site Address: Transit
 City: _____ State: _____ Zip: _____ County: _____
 Projects Contact Name: Don Coale Phone: _____ Email: _____

Do not use this form in
 New Jersey or Florida
 Call for correct forms.

Multi-Page Report Y-N

LAB USE ONLY	
Wgt. Gain	pCi/L
	LOF
	LOF
	LOF
	LOF

Detector Serial#	ROOM NAME & NUMBER - LOCATION OF DETECTOR IN ROOM (indicate duplicates and blanks)	Floor	Start Date	Start Time Include AM/PM	Stop Date	Stop Time Include AM/PM
3028953	Transit	1	1/19/16	approx: 00pm 1/23/16		9:30am
8955	Transit	1	1/19/16			
8954	Transit	1	1/19/16			
8997	Transit	1	1/19/16			

1/27/2016

KCI Technologies, Inc.

3010588 3028953 ACPC275B EXP12/31/2018

Structure Type: (circle one or more) Basement - Crawlspace - Slab on Grade - Other
Test Purpose: (Circle all that apply) Initial Screening - Follow Up Test - Post Mitigation - Real Estate - Other
Building Type: (Circle One) Residential - Non Residential
 Private Day Care - Private School
 Day Care in Public School - Public School

Both Placed by and Retrieved by signatures are required
 Canisters placed by _____ # _____
 Canisters retrieved by _____ # _____

Send Results To:
 Company Name: KCI Tech
 Address: 936 Ridgebrook
 City: Sparks State: MD Zip: 21152
 Phone: 410-599-3826
 EMAIL Results to: James.Mouldale@kci.com

Were general operating conditions maintained?
 Yes - No explain if NO
 Were closed building conditions maintained?
 Yes - No explain if NO
 Normal Temp. Yes - No
 Normal Humidity Yes - No
 Windy Y-N Rainy Y-N

Make sure information is complete and correct.
 If a recalculation is requested there is a \$10.00 recalc fee PER Canister.

Mailing: PO Box 990 Jonestown, PA 17038
 Shipping: 929 Mt Zion Road, Lebanon, PA 17046
 800-523-4964 fax 717-274-5662
 NEHA 10511AL NRSB ARL 0007

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 173618

NOMINAL Conditions: Radon Conc 25.2 pCi/L Rel. Hum 49.1 % Temp. 72.0 F

Date Start: 1/23/16 Date Stop: 1/25/16 Date Start: _____ Date Stop: _____

Time Start: 0821 Time Stop: 0821 Time Start: _____ Time Stop: _____

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

3028985 thru 3028990

E2 left

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

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

NRPP 10511AL
NRSB ARL0007

EPA Method #402-R-92-004
Charcoal Canister
NRPP Device Code 6048
NRSB Device Code 10317

Laboratory Report for:

Property Tested:

KCI Technologies
936 Ridgebrook Rd
Sparks MD 21152

MCPS
Radon Spike Sample Laboratory Results

Log Number	Device Number	Test Exposure Duration:		Area Tested	Result (pCi/L)
3010551	3028985	01/23/2016 8:20 am	01/25/2016 8:20 am	1 First Floor	24.2
3010552	3028986	01/23/2016 8:20 am	01/25/2016 8:20 am	2 First Floor	25.7
3010553	3028987	01/23/2016 8:20 am	01/25/2016 8:20 am	3 First Floor	23.8
3010554	3028988	01/23/2016 8:20 am	01/25/2016 8:20 am	4 First Floor	23.3
3010555	3028989	01/23/2016 8:20 am	01/25/2016 8:20 am	5 First Floor	24.0
3010556	3028990	01/23/2016 8:20 am	01/25/2016 8:20 am	6 First Floor	24.4

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.

Comment: A copy of this report was emailed to james.mouldsdale@kci.com.

Distributed by: KCI Technologies, Inc.

Date Received: 01/27/2016 Date Logged: 01/27/2016 Date Analyzed: 01/28/2016 Date Reported: 01/28/2016

Report Reviewed By: Christie Bates

Report Approved By: Carolyn D. Koke

Disclaimer:

Carolyn D. Koke, President, AccuStar Labs

The uncertainty of this radon measurement is +/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

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Return canisters for analysis to:
AccuStar Labs
 929 Mt. Zion Rd., Lebanon, PA 17046
 800-523-4964

AccuStar Labs - Lebanon, PA
INFORMATION FORM - Large Buildings -
Projects - Apartments

Instructions on back of form
 Read instructions carefully
 Discrepancies will invalidate tests

RECEIVED JAN 27 2016

Test Site Info

Name of Building/Project or Owner MCPS

Site Address: 750 Hungerford Dr

City: Rockville MD

State MD Zip 20850

County Montgomery

Projects Contact Name: James Moultsdale Phone: 410-891-1842 Email: James.moultsdale@kci.com

Do not use this form in
 New Jersey or Florida
 Call for correct forms.

Multi-Page Report Y-N

Detector Serial#	ROOM NAME & NUMBER - LOCATION OF DETECTOR IN ROOM (indicate duplicates and blanks)	Floor	Start Date	Start Time Include AM/PM	Stop Date	Stop Time Include AM/PM	LAB USE ONLY	
							Wgt. Gain	pCi/L
3028985	1 3010551	1	1/23/16	08:20	1/25/16	08:20		N/A
3028986	2 3010552	1						
3028987	3 3010553	1						
3028988	4 3010554	1						
3028989	5 3010555	1						
3028990	6 3010556	1						

Structure Type: (circle one or more) Basement - Crawlspace - Slab on Grade - Other
Test Purpose: (Circle all that apply) Initial Screening - Follow Up Test -
 Post Mitigation - Real Estate - Other
Building Type: (Circle One) Residential - Non Residential
 Private Day Care - Private School
 Day Care in Public School - Public School

Both Placed by and Retrieved by signatures are required
 Canisters placed by James Moultsdale

Canisters retrieved by James Moultsdale

Owner waives confidentiality by signing here

Send Results To:

Company Name: KCI technologies Inc

Address: 936 Ridgebrook Rd

City: Sparks MD 21152

Phone: 410-891-1842

EMAIL Results to: James.moultsdale@kci.com

State: 7in

Fax:

1/27/2016

KCI Technologies, Inc.

Mailing: PO Box 990 Jonestown
 Shipping: 929 Mt Zion Road, Le
 800-523-4964 fax 717-2

3010551 **3028985** ACPC275B EXP12/31/2018

Were general operating conditions maintained? Yes - No explain if NO
 Were closed building conditions maintained? Yes - No explain if NO
 Normal Temp. Yes - No
 Normal Humidity Yes - No
 Windy YN Rainy YN



MCPS RADON TESTING

Executive Summary: Woodlin Elementary School

Date of Test Report:	2/23/2016 (Rev 3)
Round of Testing:	Initial Follow-up Post Remediation
# Rooms Tested:	60
# Rooms \geq 4.0 pCi/L:	1
Low Value:	< 0.3
High Value:	8.6

Rooms with results \geq 4.0 pCi/L:
Room 100 (8.6 pCi/L)

Project Status:

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



January 15, 2016 (Rev 3)

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

Re: **Radon Testing Services**
KCI Job # 12146341.20

Location: Woodlin Elementary School
2101 Luzerne Avenue
Silver Spring, MD 20910

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 Woodlin Elementary School, located at 2101 Luzerne Avenue in Silver Spring, Maryland 20910 (subject site).

Scope of Services:

KCI conducted radon testing at the subject site to evaluate indoor radon levels relative to the USEPA's recommended action level of 4.0 picocuries per Liter (pCi/L) - the level at which EPA recommends that schools take action to reduce the level. KCI conducted the radon testing in accordance with American Association of Radon Scientists and Technologists (AARST) *Protocol for Conducting Measurements of Radon and Radon Decay Products in Schools and Large Buildings*. A National Radon Safety Board (NRSB) Radon Measurement Specialist (certification #14SS056) supervised the testing. Additional information on radon management and the health effects of radon exposure is available from www.montgomerycountymd.gov/dep/air/radon or www.epa.gov/radon.

KCI visited the site on December 21, 2015 and deployed seventy-four (74) 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 24, 2015 to retrieve the radon sampling test kits. KCI shipped all radon tests via overnight delivery to Airchek, Inc. for analysis by gamma-ray spectroscopy. Airchek, Inc. is a NRSB certified analytical laboratory for radon analysis (certification # ARL1402) located at 1936

Butler Bridge Road, Mills River, North Carolina.

Evaluation of Testing Conditions:

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

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

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

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

Results:

The results of the radon test analysis indicated the following:

Radon Concentration	Room	Result
≥ 4.0 pCi/L	100	8.6
< 4.0 pCi/L	See Attachment B	

Notes:

D- Duplicate sample

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

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

Our professional services have been performed in accordance with customary principles and practices in the field of industrial hygiene and engineering. If you have any questions or comments regarding this report, please feel free to contact me at (410) 316-7800.

Sincerely,



James M. 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

Radon Testing Results		
Woodlin E.S		
Test Period: 12/21/15-12/24/15		
Kit Number	Room / Area	Result
7708243	1	1.0
7712068	2	0.8
7708242	3	1.0
7712077	5	1.3
7712069	6	1.5
7712065	7	1.5
7708229	8	0.9
7712076	9	1.8
7712060	10	1.9
7708212	11	3.6
7708246	12	3.1
7712063	13	2.7
7712064	14	2.1
7712067	15	2.0
7712081	16	1.3
7712079	17	1.3
7712083	18	1.2
7712086	19	1.6
7708224	20	1.3
7712096	21	0.8
7708248	22	0.7
7708221	23	0.9
7712061	24	0.7
7712062	25	1.1
7708223	26	2.0
7712082	27	1.5
7712091	28	1.2
7712089	29	1.5
7712074	30	1.5
7708232	31	1.7
7712078	32	0.8
7712093	33	1.0
7708234	34	1.5
7712092	35	1.0
7712072	100	8.6
7712073	* 4 (missing)	-
7708233	All Purpose Room	1.9
7712095	* All Purpose Room (tampered)	2.0
7712088	* Asst. Principal (tampered)	< 0.3
7712066	Bldg Service	3.1
7708227	Conference	0.8
7708215	Counselor	0.8
7712094	Gym	1.5
7712100	* Gym (tampered)	1.4
7708245	Gym Office	2.2
7708220	Health Room	1.0

Table Note:

* Missing or Compromised Sample

Room numbers obtained from archived floor plan [onsite school provided floor plan]

Radon Testing Results		
Woodlin E.S		
Test Period: 12/21/15-12/24/15		
Kit Number	Room / Area	Result
7712085	Media Center	< 0.3
7712084	Media Center (middle office)	< 0.3
7712080	Media Center (south office)	< 0.3
7708226	Office	0.7
7708222	Office 204	0.7
7712097	P-3	< 0.3
7712098	P-4	< 0.3
7708244	P-5	< 0.3
7712195	P-6	< 0.3
7708235	P-7	< 0.3
7712099	P-8	< 0.3
7708230	P-9	< 0.3
7708216	Principal	0.8
7712048	Staff Lounge 1	0.8
7708228	* Staff Lounge 2 (tampered)	0.8
7708239	Work Room	0.7

Table Note:

* Missing or Compromised Sample

Room numbers obtained from archived floor plan [onsite school provided floor plan]

Radon Testing Results		
Woodlin E.S		
Test Period: 12/21/15-12/24/15		
Kit Number	QC Type	Result
7708219	D (1)	0.8
7712071	D (14)	2.6
7712087	D (19)	1.6
7712090	D (32)	0.9
7708236	D (Gym Office)	2.3
7712196	D (P-5)	< 0.3
7708240	D (Principal)	1.1
7708237	FB (34)	< 0.3
7712075	FB (9)	< 0.3
7708225	FB (Conference)	< 0.3
7708231	FB (Gym Office)	< 0.3
7712188	OB (0)	< 0.3

Table Note:

* Missing or Compromised Sample

Room numbers obtained from archived floor plan [onsite school provided floor plan]

ATTACHMENT C

Laboratory Analytical Results

February 29, 2016
LABORATORY ANALYSIS REPORT

Radon test result report for:
WOODLIN E.S
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7712188	0	2015-12-21 @ 6:00 pm	2015-12-24 @ 2:00 pm	< 0.3	2015-12-28
7708243	1	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	1.0 ± 0.3	2015-12-29
7708219	1	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	0.8 ± 0.4	2015-12-29
7712060	10	2015-12-21 @ 5:00 pm	2015-12-24 @ 11:00 am	1.9 ± 0.3	2015-12-28
7712072	100	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	8.6 ± 0.6	2015-12-28
7708212	11	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	3.6 ± 0.4	2015-12-28
7708246	12	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	3.1 ± 0.4	2015-12-28
7712063	13	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	2.7 ± 0.4	2015-12-28
7712064	14	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	2.1 ± 0.3	2015-12-28
7712071	14	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	2.6 ± 0.4	2015-12-28
7712067	15	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	2.0 ± 0.4	2015-12-28
7712081	16	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.3 ± 0.3	2015-12-28
7712079	17	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.3 ± 0.4	2015-12-28
7712083	18	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.2 ± 0.3	2015-12-28
7712087	19	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.6 ± 0.3	2015-12-28
7712086	19	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.6 ± 0.4	2015-12-29
7712068	2	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	0.8 ± 0.3	2015-12-28
7708224	20	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.3 ± 0.4	2015-12-29
7712096	21	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	0.8 ± 0.3	2015-12-28
7708248	22	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	0.7 ± 0.3	2015-12-28
7708221	23	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	0.9 ± 0.3	2015-12-28
7712061	24	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	0.7 ± 0.3	2015-12-28
7712062	25	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	1.1 ± 0.3	2015-12-28
7708223	26	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	2.0 ± 0.3	2015-12-28
7712082	27	2015-12-21 @ 3:00 pm	2015-12-24 @ 12:00 pm	1.5 ± 0.4	2015-12-29
7712091	28	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.2 ± 0.3	2015-12-28
7712089	29	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.5 ± 0.3	2015-12-28
7708242	3	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	1.0 ± 0.3	2015-12-28
7712074	30	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.5 ± 0.3	2015-12-28
7708232	31	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	1.7 ± 0.3	2015-12-28
7712078	32	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	0.8 ± 0.3	2015-12-28
7712090	32	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	0.9 ± 0.3	2015-12-29
7712093	33	2015-12-21 @ 4:00 pm	2015-12-24 @ 1:00 pm	1.0 ± 0.3	2015-12-28
7708237	34	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7708234	34	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	1.5 ± 0.4	2015-12-29
7712092	35	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	1.0 ± 0.3	2015-12-28
7712077	5	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	1.3 ± 0.3	2015-12-28

February
29,
2016

LABORATORY ANALYSIS REPORT **

Radon test result report for:

**WOODLIN E.S
MAIN**

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7712069	6	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	1.5 ± 0.4	2015-12-28
7712065	7	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	1.5 ± 0.3	2015-12-28
7708229	8	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	0.9 ± 0.3	2015-12-28
7712076	9	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	1.8 ± 0.4	2015-12-28
7712075	9	2015-12-21 @ 2:00 pm	2015-12-24 @ 1:00 pm	< 0.3	2015-12-29
7708233	ALL PURPOSE ROOM	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	1.9 ± 0.4	2015-12-28
7712095	ALL PURPOSE ROOM	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	2.0 ± 0.4	2015-12-28
7712088	ASST. PRINCIPAL	2015-12-21 @ 3:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-29
7712066	BLDG SERVICE	2015-12-21 @ 3:00 pm	2015-12-24 @ 12:00 pm	3.1 ± 0.4	2015-12-28
7708227	CONFERENCE	2015-12-21 @ 2:00 pm	2015-12-24 @ 1:00 pm	0.8 ± 0.3	2015-12-28
7708225	CONFERENCE	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	< 0.3	2015-12-28
7708215	COUNSELOR	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	0.8 ± 0.3	2015-12-28
7712094	GYM	2015-12-21 @ 4:00 pm	2015-12-24 @ 1:00 pm	1.5 ± 0.3	2015-12-28
7712100	GYM	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	1.4 ± 0.3	2015-12-28
7708231	GYM OFFICE	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7708236	GYM OFFICE	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	2.3 ± 0.4	2015-12-28
7708245	GYM OFFICE	2015-12-21 @ 4:00 pm	2015-12-24 @ 12:00 pm	2.2 ± 0.4	2015-12-29
7708220	HEALTH ROOM	2015-12-21 @ 1:00 pm	2015-12-24 @ 11:00 am	1.0 ± 0.3	2015-12-28
7712085	MEDIA CENTER	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	< 0.3	2015-12-28
7712084	MEDIA CENTER (MI	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	< 0.3	2015-12-28
7712080	MEDIA CENTER (SO	2015-12-21 @ 3:00 pm	2015-12-24 @ 11:00 am	< 0.3	2015-12-28
7708226	OFFICE	2015-12-21 @ 1:00 pm	2015-12-24 @ 11:00 am	0.7 ± 0.3	2015-12-28
7708222	OFFICE 204	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	0.7 ± 0.3	2015-12-28
7708240	PRINCIPAL	2015-12-21 @ 1:00 pm	2015-12-24 @ 11:00 am	1.1 ± 0.3	2015-12-28
7708216	PRINCIPAL	2015-12-21 @ 1:00 pm	2015-12-24 @ 1:00 pm	0.8 ± 0.3	2015-12-28
7712048	STAFF LOUNGE 1	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	0.8 ± 0.3	2015-12-28
7708228	STAFF LOUNGE 2	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	0.8 ± 0.3	2015-12-28
7708239	WORK ROOM	2015-12-21 @ 2:00 pm	2015-12-24 @ 11:00 am	0.7 ± 0.3	2015-12-28

February 29, 2016 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
WOODLIN E.S
PORTABLE

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7712097	P-3	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7712098	P-4	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7708244	P-5	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7712196	P-5	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7712195	P-6	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7708235	P-7	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7712099	P-8	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-28
7708230	P-9	2015-12-21 @ 5:00 pm	2015-12-24 @ 12:00 pm	< 0.3	2015-12-29

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

December
29,
2015

****LABORATORY ANALYSIS
REPORT ****

Radon test result report for:
TRANSIT DEC 14 2015
NONE

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
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

December
23,
2015

**LABORATORY ANALYSIS
REPORT ****

Spike Sample Laboratory Results

Radon test result report for:
MCPS

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

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

EXPOSURE IN BOWSER-MORNER RADON CHAMBER

CLIENT KCI Technologies Inc. Job Number 173224

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

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

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

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

7706211, 7706366, _____

7706380, 7706381 _____

F3 Left

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

Date Start: _____ Date Stop: _____ Date Start: _____ Date Stop: _____

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

Device No.'s: _____ Device No.'s: _____

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



Chain of Custody

Project Name: MCPS Radon Phase II

School Names:

- | | | |
|---------------------------|-----------------------------|---------------------------|
| 1. Bannockburn ES | 11. Sherwood HS | 21. Fairland ES |
| 2. Walt Whitman HS | 12. Hadley Farms | 22. Cannon Road ES |
| 3. Walter Johnson HS | 13. S. Christa McAuliffe ES | 23. Richard Montgomery HS |
| 4. North Chevy Chase ES | 14. Ronald A. McNair ES | 24. Brooke Grove ES |
| 5. Piney Branch ES | 15. MLK MS | 25. Belmont ES |
| 6. Forest Knolls ES | 16. Ashburton ES | 26. Emory Grove |
| 7. Newport Mill MS | 17. Bradley Hills ES | 27. Clarksburg HS |
| 8. Broad Acres ES | 18. Flora M. Singer ES | 28. Clarksburg ES |
| 9. Briggs Chaney MS | 19. Woodlin ES | 29. John T. Baker MS |
| 10. Blair G. Ewing Center | 20. Montgomery Knolls ES | |

	Date	Initials
Radon Test Kits Deployed	12/21/2015	JM
Radon Test Kits Collected	12/24/2015	JM
Radon Test Kits Shipped to Lab*	12/24/2015	JM
Radon Test Kits Received by Lab*	12/28/2015	JM

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