RADON GAS SAMPLING AND ANALYSIS REPORT

Prepared by:

For:

Jeff Webster
Warrensburg (MO) R6 School District
201 S. Holden Street
Warrensburg, MO 64093

Project:

Radon Gas Sampling and Analysis
Martin Warren Elementary School
105 S. Maguire Street
Warrensburg, MO 64093

TES Project No.: 26086ALMR.01B

March 16, 2026

Full Service Environmental Consulting, Testing & Contracting
2418 Merriam Lane, KCK 66106 | Phone: 913-432-5500 | www.titankc.com

March 26, 2026 TES Project No.: 26086ALMR.01B

Jeff Webster
Warrensburg (MO) R6 School District
201 S. Holden Street
Warrensburg, MO 64093

RE: Report of Findings for Radon Gas Sampling and Analysis
Martin Warren Elementary School
105 S. Maguire Street
Warrensburg, MO 64093

Dear Client:

Titan Environmental Services, Inc. (TES) is pleased to provide this report of findings associated with the radon gas testing performed at 105 S. Maguire Street, Warrensburg, MO 64093 The radon gas testing was performed by Karla Granger, a National Radon Proficiency Program (NRPP) Radon Measurement Technician (Certificate #: 107404-RMP, Expiration date: January 31, 2028). Testing was conducted in accordance with HUD Guidelines and in general accordance with ANSI/AARST MA-MFLB-2023: Protocol for Conducting Radon and Radon Decay Product Measurements in Multifamily, School, Commercial and Multi-Use Buildings.

TES previously conducted a radon sampling event at the subject property from March 10-12, 2026, in accordance with HUD guidelines and in general accordance with ANSI/AARST MA-MFLB-2023. All but 12 of the results during that testing were below the EA ANSI/AARST MA-MFLB-2023PA Action Level of 4.0 picocuries per liter of air (4.0 pCi/L). At client request, only the first floor classrooms that exhibited radon above the EPA standard were tested at this time. This report only references these classrooms.

Background Information

Radon gas comes from the natural (albeit radioactive) breakdown of uranium in soil, rock, and water, and enters the body through inhalation. Radon content within the air is ubiquitous; it can be found within any home in the United States, in both indoor and outdoor air. As such, it can be found in the air content of any building, regardless of property history or use.

Radon is the second-leading cause of lung cancer in the United States, behind tobacco use. Radon gas decays into radioactive particles which are trapped within the alveoli of the lungs when inhaled. As they break down further, these particles release small bursts of energy. This can damage lung tissues and lead to lung cancer of the course of your lifetime. Not everyone exposed to elevated levels of radon will develop lung cancer; factors that may affect your risk of lung cancer can include factors such as time exposed, other chemicals the lungs are exposed to (e.g. tobacco smoke, Volatile Organic Compounds (VOCs), etc.), and other such factors.

Radon Testing Procedure

On March 19, 2026, TES placed **six (6)** radon gas measurement devices throughout the subject property, excluding blank samples. Duplicates are pairs of detectors or monitors deployed in the same location, side-by-side, for the same measurement period. The purpose of duplicates is to evaluate precision or agreement between detectors or monitors. Some variation between detectors of monitors. Some variation between the results of each detector is expected, but excessive variation could result from poor quality sampling media. Blanks help evaluate any detector response from sources other than radon exposure (i.e., in the manufacturing process, during shipment, storage, analysis, and handling. Ten percent (10%) duplicates and five percent (5%) field blanks were deployed for quality assurance and control (QA/QC) purposes. Each sample was set for a minimum of 48 hours in a location that was between 2.5 and 5.5 feet off the floor. This area is chosen due to it being the height at which air is typically inhaled by most human beings.

On March 23, 2026, TES Collected the Pro-Chek radon measurement devices and submitted the samples to Air-Chek Inc., in Mills River, NC (NRPP Certified Lab no.: 101138AL). The test and analysis was performed to comply with the US Environmental Protection Agency (USEPA) and State of Missouri Department of Health and Senior Services (MDHSS) short-term radon testing protocol. The test results represent the average radon concentration at the time of the sampling event, and at each specific location tested within the subject property.

There is a level of uncertainty with any measurement result, due to statistical variations and other factors. These include factors such as daily and seasonal variations in radon concentrations, weather, operation of the dwelling, or possible interference with the necessary test conditions. The average radon gas level at the time of sampling, measured in picocuries of radon per liter of air (pCi/L: +/- 0.3) has been included as well. No tampering was observed during the course of the sampling event. Closed building conditions were observed for the duration of the test.

The following table details the results of the radon sampling event at the subject property:

Sample #	Location	EPA Recommended Action Guideline	Test Results (3/12/26)	Test Results (3/23/26)	Average for Both Events
7552714	Classroom 103	4.0 pCi/L	4.8 pCi/L	<0.3 pCi/L	<2.6 pCi/L
7552717	Classroom 105	4.0 pCi/L	4.4 pCi/L	0.6 pCi/L	2.5 pCi/L
7552710	Classroom 106	4.0 pCi/L	4.5 pCi/L	<0.3 pCi/L	<2.4 pCi/L
7552713	Classroom 107	4.0 pCi/L	5.4 pCi/L	0.6 pCi/L	<3.1 pCi/L
7552708	Classroom 109 (QC)	4.0 pCi/L	<0.3 pCi/L	N/A	N/A
7552707	Classroom 121	4.0 pCi/L	5.6 pCi/L	0.6 pCi/L	3.1 pCi/L
7552709	Classroom 121 (duplicate)	4.0 pCi/L	N/A	0.6 pCi/L	N/A
Average for Classroom 121		4.0 pCi/L	N/A	0.6 pCi/L	N/A

N/A: Not Applicable

Based on the results of this sampling event, the samples collected from Classroom 107, Classroom 106, Classroom 105, Classroom 103, and Classroom 121 reported radon gas concentrations were below the USEPA action guideline of 4.0 pCi/L at the time of our sampling. Because the average radon concentrations in these classrooms were below the USEPA action guidance of 4.0 picocuries per liter of air, no mitigation procedures for these areas is recommended at this time.

However, it should be noted the concentrations of radon in the basement areas that were shown to be above the USEPA action guidance during the previous sampling event will still need to be addressed (e.g., radon mitigation). Test results of 0.5 pCi/L or less are, for all practical purposes, equivalent to the radon levels found in fresh air.

The OSHA radon exposure limit is an average concentration for 40 hours in any workweek of 7 consecutive days. The still applicable 1971 radon-222 exposure limit for adult employees is $1 * 10^{-7}$ microcuries per milliliter (μ Ci/ml), or 100 pCi/L averaged over a 40-hour workweek. The average concentration in outdoor air is 0.4 p/Ci/L or 10% of the USEPA's 4 pCi/L action level. The average radon concentration in the indoor air in the first floor classrooms tested during this assessment is 0.6 pCi/L; below both the national EPA average for indoor air in homes (1.3 pCi/L); and the EPA Action Level. The average indoor radon levels of Johnson County, Missouri, as determined by Federal EPA Radon Concentration data (and confirmed by data by Air Chek, Inc.) is 2.4 pCi/L (between 2.0 pCi/L and the USEPA action level of 4.0 pCi/L).

Recommendations:

Retest all building(s) at least every 5 years, and in conjunction with any sale of the building. Furthermore, it is recommended that subsequent tests be performed in a different season as the initial test, to obtain at least one test under a different season that represents a significant portion of the yearlong operating condition for the building (e.g. if the initial test was performed in summer, consider performing the next test in winter, and so on). In addition, be certain to retest the property whenever any of the following circumstances occur:

- A new addition is constructed or alterations for building reconfiguration or rehabilitation occur.
- A ground-contact area not previously tested is occupied.
- Heating or cooling systems are altered in such a way that air distribution or pressure relationships change within the property.
- Ventilation is altered by extensive weatherization, changes to mechanical systems, or comparable procedures.
- Sizeable openings to soil occur due to any of the following:
    - Groundwater or slab surface water control systems are added or altered (e.g., sumps, perimeter drain tile, shower/tub retrofits, etc.)
    - Natural settlement occurs, causing major cracks to develop.
    - Earthquakes, construction blasting, or formation of sinkholes occur near the subject property.
    - A radon mitigation system is altered, modified, or repaired.
- If renovations or other structural changes are planned in the lower level of the subject property.

Additional information regarding radon testing and mitigation can be accessed at www.epa.gov/radon and https://health.mo.gov/living/environment/radon.

Closing Comments

TES has performed the tasks set forth above in a thorough and professional manner consistent with industry standards.

This limited scope radon sampling event and report does not and cannot address correction of the conditions that caused the contamination to occur nor does this report reflect on conditions post-cleanup that may develop that could support or encourage the redevelopment of the asbestos contamination. Furthermore, TES cannot guarantee and does not warrant that these limited testing events have revealed all asbestos contamination affecting the site. The results reported and any opinions reached by TES are for the benefit of the client. The results and opinions set forth by TES in its report will be valid as of the date of the report.

TES appreciates the opportunity to be of service to you. If you have any questions, please do not hesitate to contact us.

Respectfully,



Karla Granger
NRPP Radon Measurement Professional

Appendices: Appendix A – Radon Gas Analytical Testing Data
Appendix B – USEPA & State of Missouri Radon Zone Maps
Appendix C – Site Photographs & Drawing
Appendix D – TES Personnel Certifications

APPENDIX A – RADON GAS ANALYTICAL TESTING DATA

A Full Service Environmental Consulting and Testing Firm
Phone: 913-432-5500 Fax: 913-432-0704

RADON SAMPLE CUSTODY FORM

CLIENT: Warrensburg (MO) R6 School District **PROJECT No:** 26086ALMR.01B
JOB LOCATION: 105 S. Maguire Street, Warrensburg, MO 64093
CONTACT/PHONE: Karla Granger 913-432-5500

SAMPLE #	LOCATION	DATE STARTED	TIME STARTED	DATE COLLECTED	TIME COLLECTED
7552714	Classroom 103	3/19/26	1530	3/23/26	1345
7552717	Classroom 105	3/19/26	1536	3/23/26	1348
7552710	Classroom 106	3/19/26	1542	3/23/26	1350
7552713	Classroom 107	3/19/26	1548	3/23/26	1353
7552708	Classroom 109 (QC)	3/19/26	1556	3/23/26	1415
7552707	Classroom 121	3/19/26	1555	3/23/26	1410
7552709	Classroom 121 (duplicate)	3/19/26	1555	3/23/26	1410

ADDITIONAL REMARKS:

Please email results to: paule@titankc.com, kgranger@titankc.com

Sampled by: Karla Granger
PRINTED Name

TURNAROUND TIME: Standard

SIGNATURE

CUSTODY

Relinquished By: _____ Date/Time: @1800

Received By: _____ Date/Time: _____

PLEASE RETURN ORIGINAL COPY TO TITAN ENVIRONMENTAL SERVICES, INC.

P.O. Box 410295, Kansas City, Missouri 64141 Phone (913) 432-5500 : Fax (913) 432-0704

March 25, 2026 **** LABORATORY ANALYSIS REPORT ****

Radon test result report for:
105 S. MAGUIRE ST., WARRENSBURG, MO
MAIN

Kit #	Room Id	Started	Ended	pCi/L	Analyzed
7552714	CLASSROOM 103	2026-03-19 @ 4:00 pm	2026-03-23 @ 2:00 pm	< 0.3	2026-03-24
7552717	CLASSROOM 105	2026-03-19 @ 4:00 pm	2026-03-23 @ 2:00 pm	0.6 ± 0.3	2026-03-24
7552710	CLASSROOM 106	2026-03-19 @ 4:00 pm	2026-03-23 @ 2:00 pm	< 0.3	2026-03-24
7552713	CLASSROOM 107	2026-03-19 @ 4:00 pm	2026-03-23 @ 2:00 pm	0.6 ± 0.3	2026-03-24
7552708	CLASSROOM 109 (QC)	2026-03-19 @ 4:00 pm	2026-03-23 @ 2:00 pm	< 0.3	2026-03-24
7552707	CLASSROOM 121	2026-03-19 @ 4:00 pm	2026-03-23 @ 2:00 pm	0.6 ± 0.3	2026-03-24
7552709	CLASSROOM 121	2026-03-19 @ 4:00 pm	2026-03-23 @ 2:00 pm	0.6 ± 0.3	2026-03-24

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

Your health risk

The primary health risk from long-term exposure to radon is lung cancer. The risk of developing a lung cancer from radon exposure depends both on how much radon is present and how long you are exposed to radon. The higher the radon level or the longer the time of exposure, even if the levels are relatively low, the greater the risk. Exposures up to 4 pCi/L may present some risk of contracting lung cancer to more sensitive occupants, especially children and those who live with smokers. The US Congress set as a goal the lowering of radon levels in buildings to equal the levels of outside air.

PERFORMING RADON TESTS FOR A REAL ESTATE TRANSACTION

US EPA protocols state that when using passive devices, such as activated charcoal tests, two short-term tests should be conducted, either together or sequentially, at the same location in the building. The tests should be averaged together and if the average is 4.0 pCi/L or higher, radon mitigation is recommended. Even if the average is below 4.0 pCi/L, the buyers should consider testing in a different season or deploy a long-term test device to assess their long-term risks. It is **highly recommended** that any property transaction tests be conducted by a non-interested third party. To locate a listed or certified radon tester, contact your state radon office or visit our website at http://www.neha-nrpp.org to download a list of NEHA-NRPP certified testers. You should also visit the EPA website to download a copy of EPA's Home Buyer's and Seller's Guide to Radon.

Radon Test Device Placement

The US EPA recommends that testing device(s) be placed in the lowest level of the home that could be used regularly, whether it is finished or unfinished. Conduct the test in any space that could be used by the buyer as a bedroom, play area, family room, den, exercise room, or workshop. Based on their client's intended use of the space, the qualified testing professional should identify the appropriate test location and inform their client (buyer). Do not test in a closet, stairway, hallway, crawl space or in an enclosed area of high humidity or high air velocity. An enclosed area may include a kitchen, bathroom, laundry room or furnace room.

Variations in Radon Levels

When tests are performed in different seasons or under different weather conditions, the initial screening and follow-up tests may vary considerably. Radon levels can vary significantly between seasons, so different values **are to be expected**. Even during normal weather, indoor radon levels may rise and fall by a factor of two on a daily cycle; for example, from 5 pCi/L to 10 pCi/L in 24 hours. During rapidly changing or stormy weather, the levels may change more dramatically. Because continual changes in radon levels are considered normal, expose the testing device for as long as is practical, while following the manufacturer's recommendations. This, of course, provides a better overall average of the measurement.

If you are comparing tests, or are averaging a series of tests, bear in mind that any radon test returns only the average of the levels present during a **specific period of time** at the **precise location** of the test. Conditions during a different test period or at a different location in the building are **expected to be different.**

Test results can also vary if the radon test instructions were not carefully followed. A laboratory measuring radon in samples taken outside the lab **must rely on the person conducting the test**. For example, the wrong starting or ending date of a test will significantly affect the calculated result. The location of each radon test can also influence the result. For example, a test placed in the blowing air stream of a fan is likely to collect more radon than it would under normal conditions. Also, three tests conducted in one home, but in three different rooms, **would be expected to have at least slightly different test results.**

Test results from a properly used activated charcoal test will more closely reflect the average radon concentrations over the last three to four days of the test period. This happens because the radon collected by the activated charcoal has a radioactive half-life of only four days. Thus, much of the radon collected early in a seven day test has already begun to decay prior to the conclusion of the test.

Retesting

It is important to understand that radon levels can change at some point in the future. Therefore, it is important to retest when there is occupancy by a new owner, before and after a new addition to the house, alterations that could alter ventilation patterns, if major cracks are noticed in foundation walls or the slab, you begin using a ground contact area of the home not previously tested, or even recent nearby construction blasting or earthquakes. EPA recommends that homes be retested every 2-3 years. If the home has been previously mitigated or alterations are made to the mitigation system, retesting should be done.

Mitigation

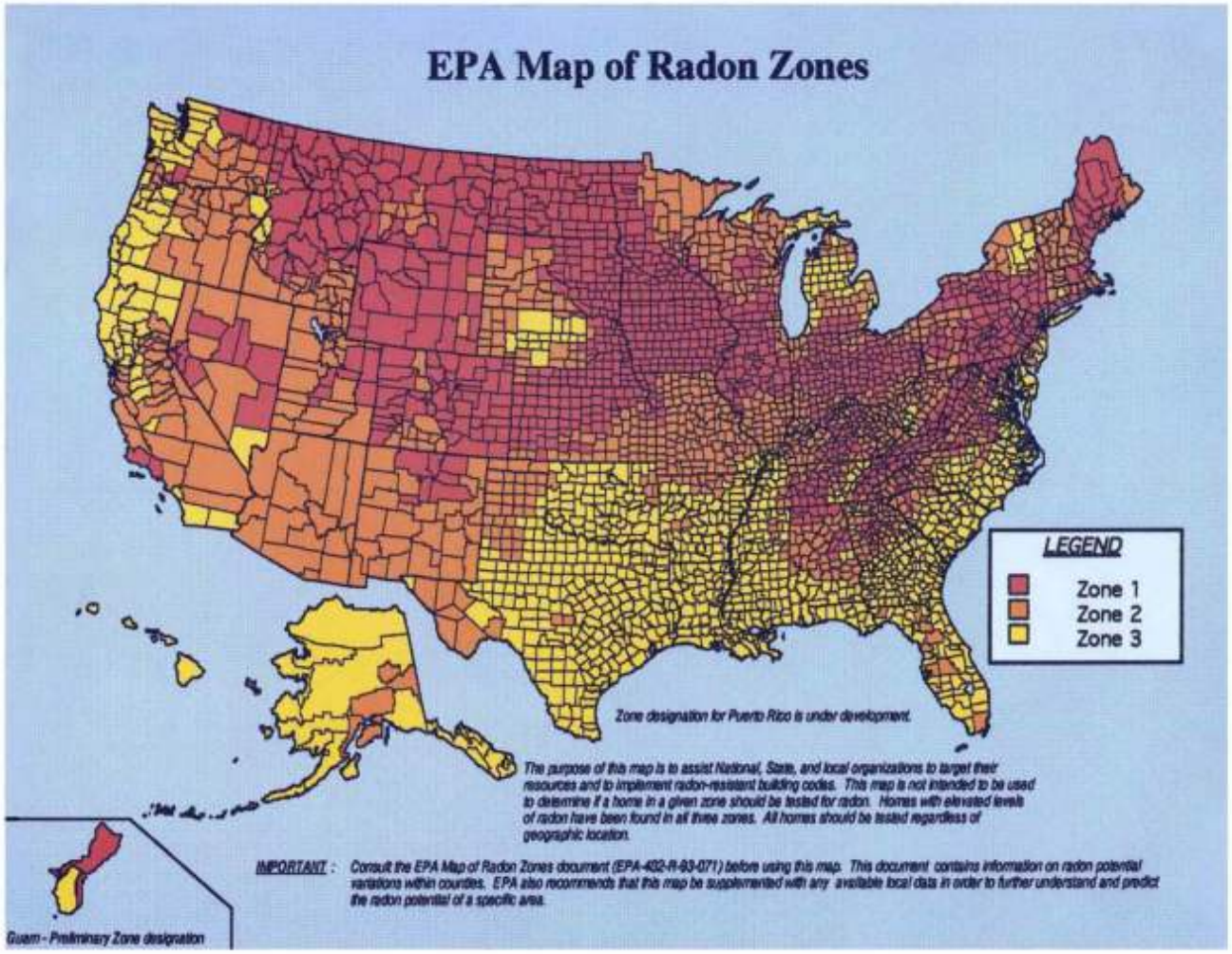
When radon mitigation is necessary, it is advisable that a state-licensed or nationally- certified contractor be used to design and install the mitigation system. For easy to read mitigation information, go to the US EPA website and download a copy of the Consumer's Guide to Radon Reduction.

For technical information, call (828) 684-0893. Office hours are Mon-Fri 8:30 to 5:30 EASTERN
You can reach us by Fax at (828) 684-8498 or write to Air Chek, Inc., Box 2000, Naples, NC 28760
Web Site: http://www.radon.com **Email to:** info@radon.com

APPENDIX B – USEPA & STATE OF MISSOURI RADON ZONE MAPS

Radon Zones Map

The U.S. Environmental Protection Agency (EPA) created this map to identify areas with the potential for elevated indoor radon levels. The EPA Map of Radon Zones helps national, state, and local organizations implement radon-resistant building codes. The map should not be used to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones. All homes should be tested for radon.



What do the colors mean?

	Zone 1 (red zones)	Highest potential; average indoor radon levels may be greater than 4 pCi/L (picocuries per liter)
	Zone 2 (orange zones)	Moderate potential; average indoor radon levels may be between 2 and 4 pCi/L
	Zone 3 (yellow zones)	Low potential; average indoor radon levels may be less than 2 pCi/L

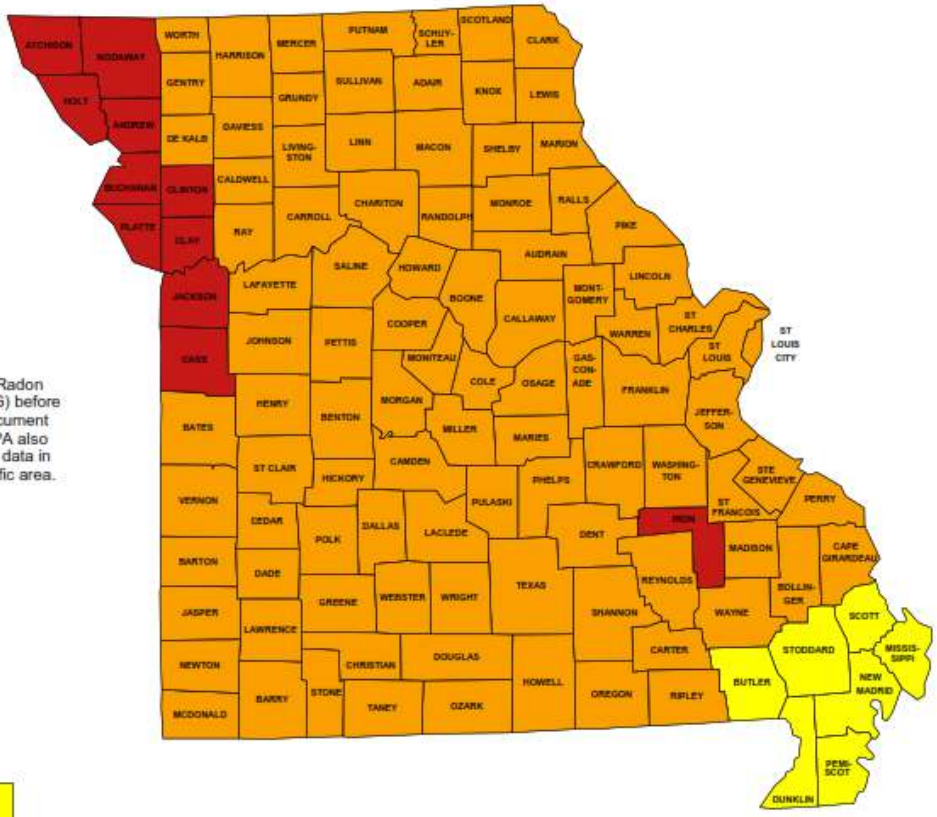
MISSOURI - EPA Map of Radon Zones

http://www.epa.gov/radon/zonemap.html

The purpose of this map is to assist National, State and local organizations to target their resources and to implement radon-resistant building codes.

This map is not intended to determine if a home in a given zone should be tested for radon. Homes with elevated levels of radon have been found in all three zones.

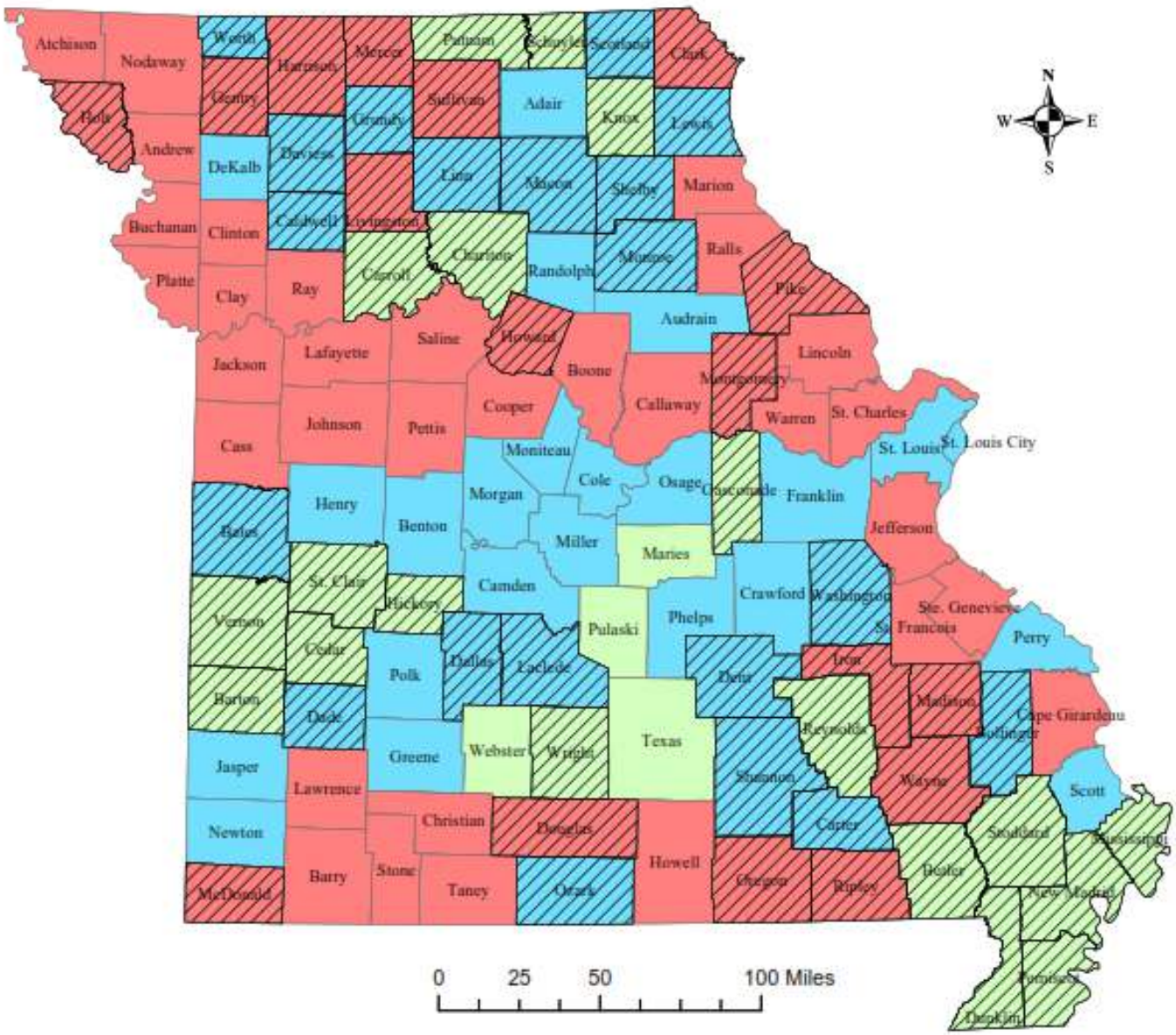
All homes should be tested, regardless of zone designation.



IMPORTANT: Consult the publication entitled "Preliminary Geologic Radon Potential Assessment of Missouri" (USGS Open-file Report 93-292-G) before using this map. http://energy.cr.usgs.gov/radon/grpinfo.html This document contains information on radon potential variations within counties. EPA also recommends that this map be supplemented with any available local data in order to further understand and predict the radon potential of a specific area.

Zone 1 Zone 2 Zone 3

Average Radon Level in Tested Homes



Average by County

- < 2.0 pCi/L
- 2.0 - 3.9 pCi/L
- >= 4.0 pCi/L
- < 30 homes tested

*Source: Bureau of Environmental Epidemiology
Indoor Air Quality Database 2005 - 2015

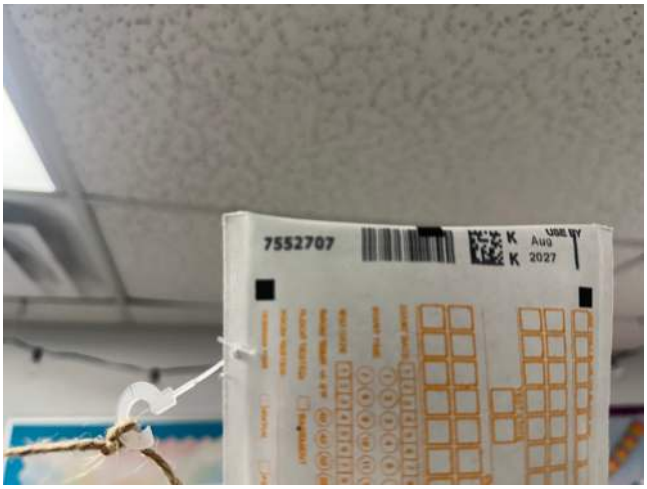
APPENDIX C – SITE PHOTOGRAPHS & DRAWINGS

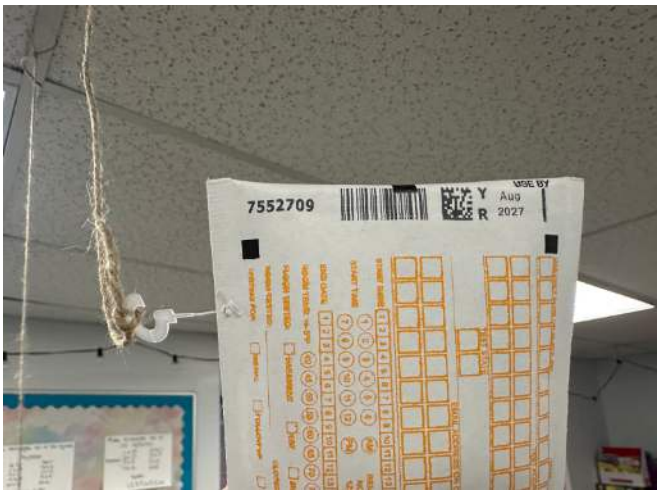


Classroom 121 Entrance



Classroom 121 Sample Location

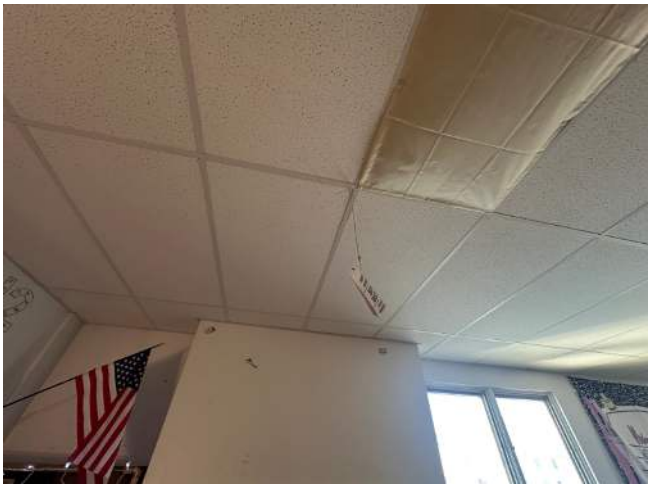




Classroom 121 Device Serial Numbers



Classroom 103 Entrance



Classroom 103 Sample Location



Classroom 103 Device Serial Number



Classroom 106 Entrance



Classroom 106 Sample Location



Classroom 106 Device Serial Number



Classroom 107 Sample Location



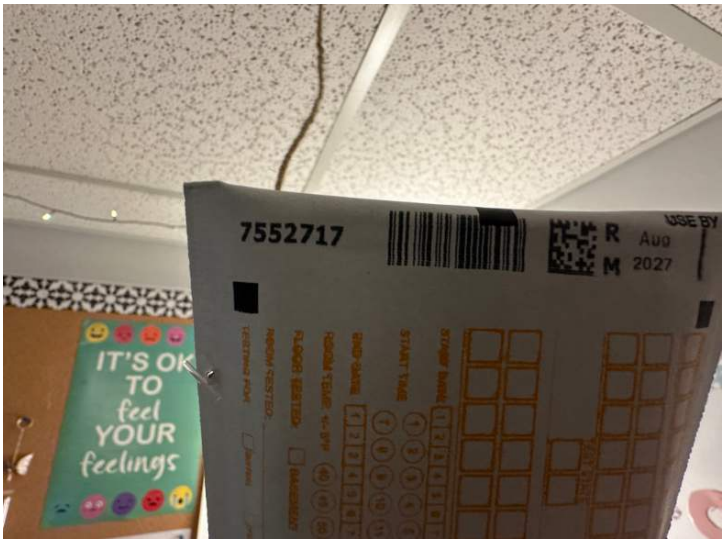
Classroom 107 Device Serial Number



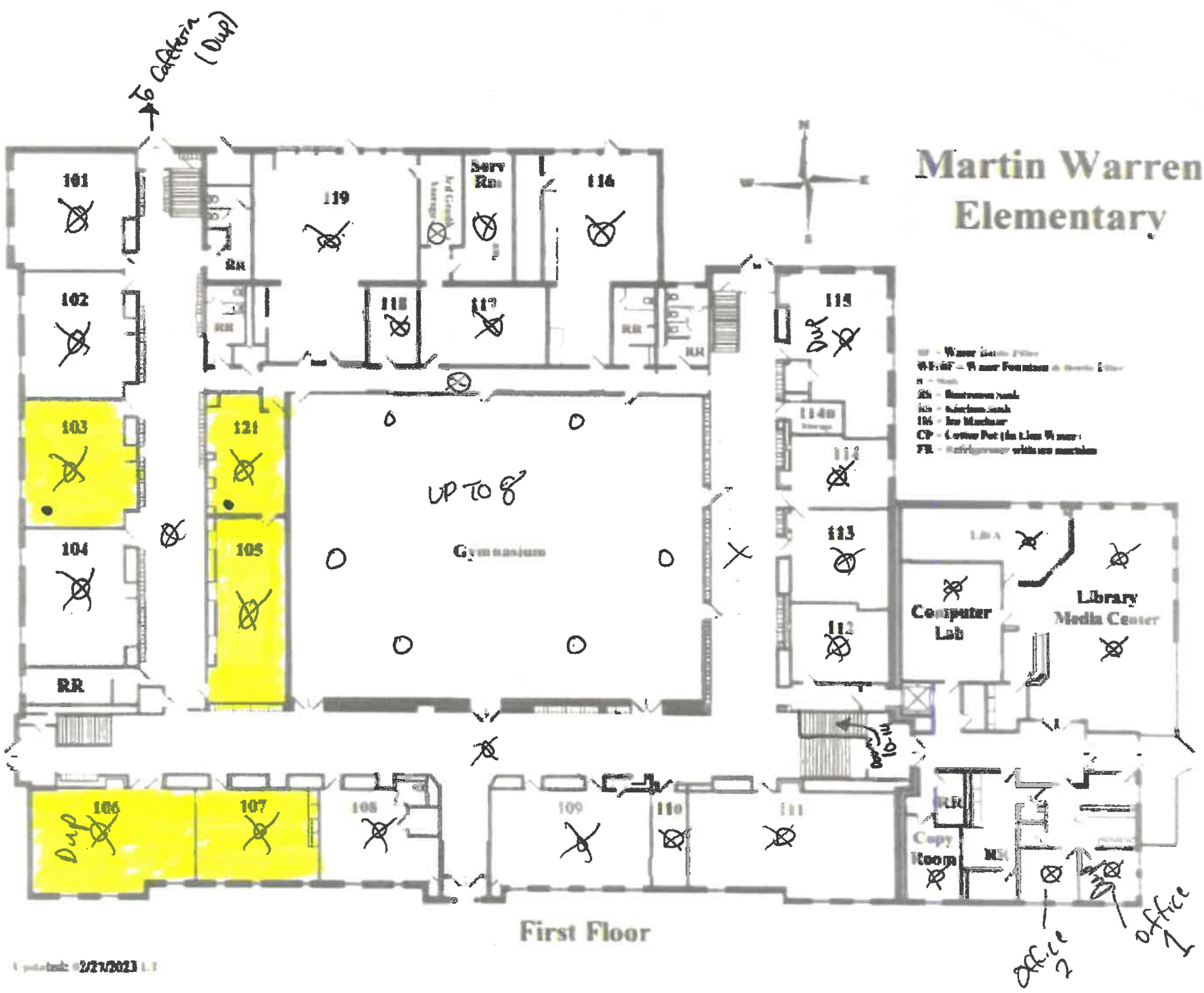
Classroom 105 Entrance



Classroom 105 Sample Location



Classroom 105 Device Serial Number


Martin Warren Elementary
to cafeteria (Dup)
101
102
103
104
RR
119
Serv Rm
116
118
117
RR
121
105
UP TO 8
Gymnasium
115
DUP
114B
114
113
112
Computer Lab
Library Media Center
106
DUP
107
108
109
110
111
Copy Room
office 2
office 1
First Floor

APPENDIX D – TES PERSONNEL CERTIFICATIONS

Karla Granger

Has satisfactorily fulfilled the requirements set forth by the
National Radon Proficiency Program and is therefore certified as a:

Radon Measurement Professional

with Standard Services

NRPP ID 107404-RMP
Issued On: 2026-01-12 Expires: 2028-01-31

Valid for specific activities or measurement devices, which can be verified with NRPP. State and local agencies may have additional requirements.

In witness Whereof,
I have subscribed my name as a
Representative of NRPP

Ashley Falco
Chair, Certification Council