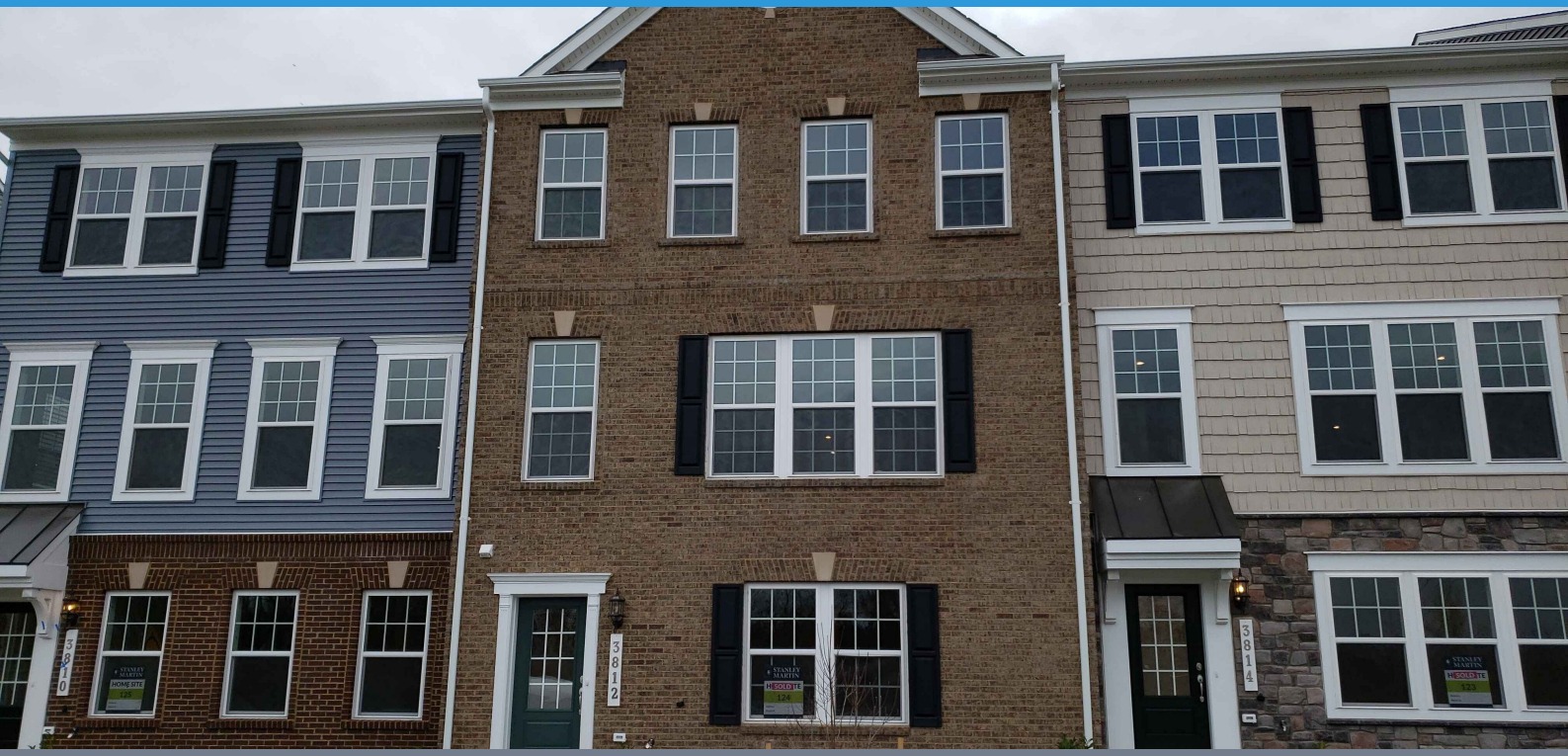
# PRO-SPEX

Residential & Commercial Inspection Services

## RADON TEST RESULTS



Client Name

Doctor Sample

Inspection Report

1234 Sample Street, Sample Twon, Maryland 12345

Report ID

AP-293-002701

Inspection Date

April 05, 2020 at 06:00 AM

Inspector Name

Glenford Blanc


Pro Spex Home & Commercial Inspection Services
606 Main St
cell : 8446758851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# REPORT INTRODUCTION

## PROPERTY & INSPECTION INFORMATION

| Full Address | Year Build | Square Footage |
|---|---|---|
| 1234 Sample Street, Sample Twon, Maryland, 12345 | 1234 | 5432 |

## TABLE OF CONTENT


| # | Radon Test Results Name |
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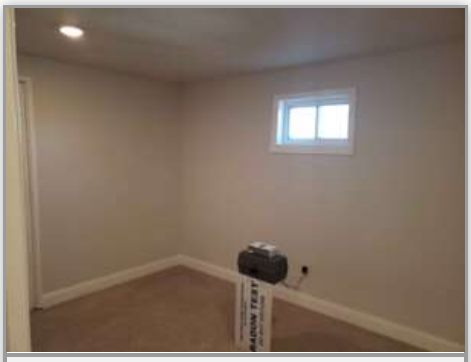
# SITE CONDITIONS IMPORTANT INFORMATION

## Photos of Testing Location

1.1



1.2

1.3

1.4

## How this test was performed

**Radon Test Device Placement**

The 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 has identifed the appropriate test location and informed all parties. Warning signs have been placed in the property to advise persons entering that a test is in progress.

**Test Interference**

There is a potential for test interference in real estate transactions. The device used will detect test interference:

- Photographs will be taken at time of placement to determine whether the test device has been moved and the device is equipped with a sensor that will detect if it has been tampered with, including loss of power.
- All parties have been informed of the need to maintain close home conditions during the testing period.
- Home buyers and sellers should consult a qualified radon test provider about the use of these precautions.

**Short-Term Testing**

All parties understand, this is a short-term test (Minimum 48 hours) intended to facilitate a Real Estate transaction, conducted according to the standards established by the EPA and the NRSB. Longer term tests may produce different results. These results assume the home was closed prior to the start of the test for at least 12 hours and closed home conditions will remain in effect for the test duration I(minimum 48 hours).

## SITE CONDITIONS TESTING INFORMATION

| Style Of Building | Occupancy | Weather Conditions at Placement |
|---|---|---|
| Town/Row-house | Vacant | Partly cloudy, Light Winds, Cold |
| **Pickup By** | **Weather Conditions at Pickup** | **Placed By** |
| Glen | Partly cloudy, Light Winds, Cold | Yvonne |
| **PLACEMENT TIME** | **PICKUP TIME** | |
| 10:00 am, , | 11:00 am, , | |

# SUMMARY OF TEST RESULTS IMPORTANT INFORMATION

**Sun Nuclear 1027 Monitor**

The radon test was conducted using a Sun Nuclear Continuous Radon Monitor.

## About the Model 1027

Model 1027 is a high-reliability, professional grade Continuous Radon Monitor. It utilizes an efficient, large chamber design, which is humidity independent. Its patented sensing technology allows for high sensitivity while greatly suppressing measurement noise.

Model 1027 is NRPP-, C-NRPP-, and NRSB-approved. It can measure up to 90 hours of continuous Radon measurements in 1-hour intervals without any additional setup. Just plug it in and go.

This professional grade Continuous Radon Monitor is equipped with a tamper sensor and is fully compatible with our OneRADON Software suite for desktop and mobile applications (adapters required), for complete test analysis and report generation. Model 1027 comes ready for use with a calibration certificate and power supply.

For more information: https://sunradon.com/products/model-1027

1.1

# SUMMARY OF TEST RESULTS TESTING INFORMATION

| EPA PROTOCOL AVE (pCi/l) | OVERALL AVG (pCi/l) | Radon Monitor SN: |
|---|---|---|
| 15.5, , | 15.6, , , , , , | 206105023 |

# HOURLY RADON READINGS

Data in pCi/l
Time Interval 1 Hr

| | | |
|---|---|---|
| 7.6 | 13.2 | 14.5 |
| 19.7 | 15.6 | 15.2 |
| 14.5 | 12.8 | 13.6 |
| 15.2 | 16.1 | 9.6 |
| | | |
| 14.8 | 17.6 | 13.2 |
| 13.2 | 13.6 | 14.0 |
| 14.5 | 14.5 | 12.8 |
| 15.6 | 11.6 | 16.5 |
| | | |
| 15.2 | 18.8 | 19.2 |
| 16.1 | 15.6 | 18.8 |
| 18.8 | 16.8 | 16.8 |
| 19.2 | 14.8 | 8.0 |
| | | |
| 12.8 | 15.2 | 12.0 |
| 18.5 | 13.2 | 14.0 |
| 19.2 | 15.2 | 12.8 |
| 19.2 | 15.6 | 20.1 |

Overall Avg.=15.4
EPA Protocol Avg.=15.5

# HOW TO INTERPRET THE RESULTS IMPORTANT INFORMATION

**What The Results Mean**

## Results Significantly Below 4.0 (2.7 or lower) pCi/L

No action needed, retest in 12 months

## Results Close to 4.0 (Above 2.7) pCi/L

The WHO Handbook on Indoor Radon: A Public Health Perspective indicates that radon exposure is a major and growing public health threat in homes and recommends that countries adopt reference levels of the gas of 100 Bq/m3 which is equivalent to 2.7 pCi/L. The WHO Handbook on Indoor Radon: A Public Health Perspective indicates that radon exposure is a major and growing public health threat in homes and recommends that countries adopt reference levels of the gas of 100 Bq/m3 which is equivalent to 2.7 pCi/L. Recommend longer term test to obtain a more accurate reading.

## Results Above 4.0 pCi/L

The US EPA has set an action level of 4.0 pCi/L. At or above this level of radon, the EPA recommends you take corrective measures to reduce your exposure to radon gas. This does not imply that a level below 4.0 pCi/L is considered acceptable, as stated in the BEIR VI study

**What is a safe and acceptable level of radon gas?**

The following information is summarized from the World Health Organization (WHO) and the Environmental Protection Agency (EPA).

## What is a safe and acceptable level of radon gas?

This is actually two separate questions. The first is: *"What is a safe level of radon gas?"* The second is: *"What is an acceptable level of radon gas?"*

## What is a safe level of radon gas?

A safe level of radon gas is no radon gas. Radon gas is a carcinogen which causes lung cancer. The US EPA has put it plainly, stating, "Any radon exposure has some risk of causing lung cancer. The lower the radon level in your home, the lower your family's risk of lung cancer." The average person receives a higher dose of radiation from the radon levels in their home than from their combined exposure to all other radiation sources, natural or man-made. Radon gas is a naturally-occurring byproduct of the radioactive decay of Uranium in the soil.

Depending on your geographic location, the radon levels of the air you breathe outside of your home may be as high as 0.75 pCi/L. The national average of outside radon levels is 0.4 pCi/L and it is estimated by the National Academy of Sciences that outdoor radon levels cause approximately 800 of the 21,000 radon induced lung cancer deaths in the US each year. Your risk of lung cancer increases substantially with exposure to higher radon levels. Lung cancer risk rises 16% per 2.7 pCi/L increase in radon exposure. World Health Organization, 2009 studies show that radon is the primary cause of lung cancer among people who have never smoked. However, the absolute numbers of radon-induced lung cancers are much larger in people who smoke, or who have smoked in the past, due to a strong combined effect of smoking and radon.

## What is an acceptable level of radon gas?

**Radon Act 51** passed by Congress set the natural outdoor level of radon gas (0.4 pCi/L) as the target radon level for indoor radon levels. Unfortunately two-thirds of all homes exceed this level. The US EPA was tasked with setting practical guidelines and recommendations for the nation. To this end, the US EPA has set an action level of 4 pCi/L. At or above this level of radon, the EPA recommends you take corrective measures to reduce your exposure to radon gas. This does not imply that a level below 4.0 pCi/L is considered acceptable, as stated in the BEIR VI study . It is estimated that a reduction of radon levels to below 2 pCi/L nationwide would likely reduce the yearly lung cancer deaths attributed to radon by 50%. However, even with an action level of 2.0 pCi/L, the cancer risk presented by radon gas is still hundreds of times greater than the risks allowed for carcinogens in our food and water.

## The World Health Organization

The WHO Handbook on Indoor Radon: A Public Health Perspective indicates that radon exposure is a major and growing public health threat in homes and recommends that countries adopt reference levels of the gas of 100 Bq/m3 which is equivalent to 2.7 pCi/L.

You can download a PDF version of the WHO handbook on indoor radon here. "Radon is the second most important cause of lung cancer after smoking in many countries," notes Dr Maria Neira, Director of WHO's Public Health and Environment Department. "Most of radon-induced lung cancers occur from low and medium dose exposures in people's homes. Strengthened action by policy makers, and by construction and building professionals can substantially lower the health impact by preventing and reducing radon exposure."

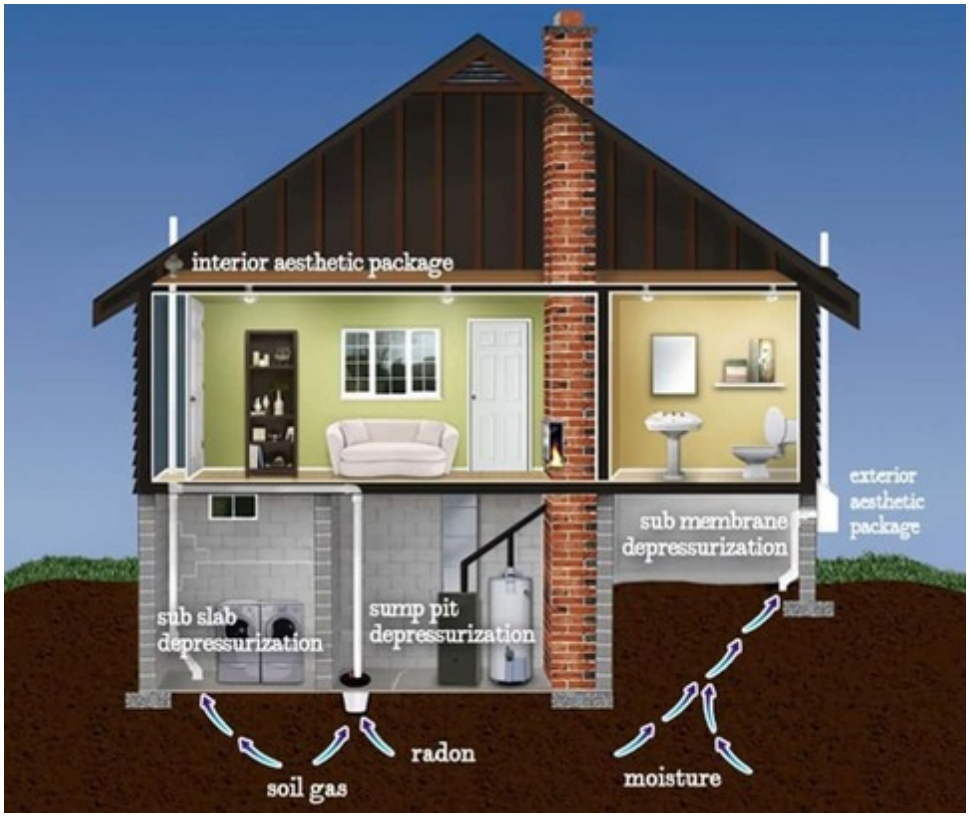
## Conclusion

While no level of radon gas is completely safe, as with most things in life we must balance the benefits and costs to find our own*"acceptable"* levels. We walk outside and work in the sun, exposing ourselves to ultraviolet radiation and increasing our risk of developing skin cancer. We drive in automobiles almost every day even though greater than 1 in 86 deaths is a result of automobile accidents. People smoke, eat poorly, and engage in dangerous behaviors on a daily basis. To some degree, radon gas is another daily risk that we all must take. However, you choose what you eat, whether or not you smoke, and how and when you drive. You have no choice but to breathe the air in your home. A simple and inexpensive radon test can give you the information you need to make an informed decision about what level of radon gas exposure is acceptable to you.

# RADON REMEDIATION IN HOMES IMPORTANT INFORMATION

## Radon Remediation

**Radon** mitigation **systems** use a fan to continuously pull air from the soil and exhaust it outdoors through a pipe. The pipe can either run inside or outside the home and discharges outside, away from the windows and openings.




Radon mitigation is any process or system used to reduce radon concentrations in buildings. The goal of the radon mitigation system is to reduce the indoor radon level as low as reasonably achievable. All systems should reduce radon below the EPA action level of 4 pCi/L (picocuries of radon per liter of air). A quality radon mitigation system may reduce year-round levels to below 2 pCi/L.

A home's foundation type helps determine the radon mitigation system that will work best. A radon professional should determine the type of mitigation system to install and may conduct some diagnostic testing. Radon mitigation systems use a fan to continuously pull air from the soil and exhaust it outdoors through a pipe. The pipe can either run inside or outside the home and discharges outside, away from the windows and openings. In addition, cracks and openings in the foundation are sealed. Sealing limits the flow of radon and makes the radon mitigation system more efficient.

The PBS series "Ask this Old House" visited a home in Minneapolis to install a radon mitigation system. The episode covers how radon systems are properly designed and installed. This video gives the viewer a good sense of what to expect from a radon mitigation professional and radon mitigation system.

## Three of the most common types of radon mitigation systems

1. **Sub-slab suction** - Pulls radon directly beneath the home's foundation and vents it outside.
2. **Drain tile suction** - Pipe penetrates into the drain tile and vents the soil gases outside. Covers are placed on the sump baskets.
3. **Sub-membrane** - Used in crawl spaces, a plastic sheet covers exposed dirt on the floor, extends up onto the wall and is sealed. A radon pipe penetrates the plastic sheeting, pulls the soil gas from the crawl space, and vents it outside.

## Radon mitigation system components

**Radon fan** is located in an unconditioned space, like an attic or outside, to prevent radon leaking back into the home. The fan is plugged into an electrical junction box or hard wired.

**Radon system tag** is placed on the system by a licensed radon professional once the system is complete.

**U-tube manometer** is a monitoring device that is installed with every system. The u-tube visually indicates the fan is working.

**Radon pipe** vent discharge should be, at least 10 feet above ground and 10 feet away from windows, openings, doors, openings to adjacent buildings, and above the edge of the roof.

## Cost of a radon mitigation system

The cost can depend on many factors including the type of radon system to be installed and how your home was built. In general, costs can range from $1,500 to $2,500. Financial assistance may be available to help pay for a radon mitigation system and depends on household income, geographic location, and funding availability.

## Finding a professional to install a radon mitigation system

Minnesota requires non-residential radon mitigation professionals to be licensed, effective January 1, 2019. Due to a court order, residential mitigation professionals are not required to be licensed through MDH at this time. Find a Radon Mitigation Professional

## 10 step guide to the radon mitigation process

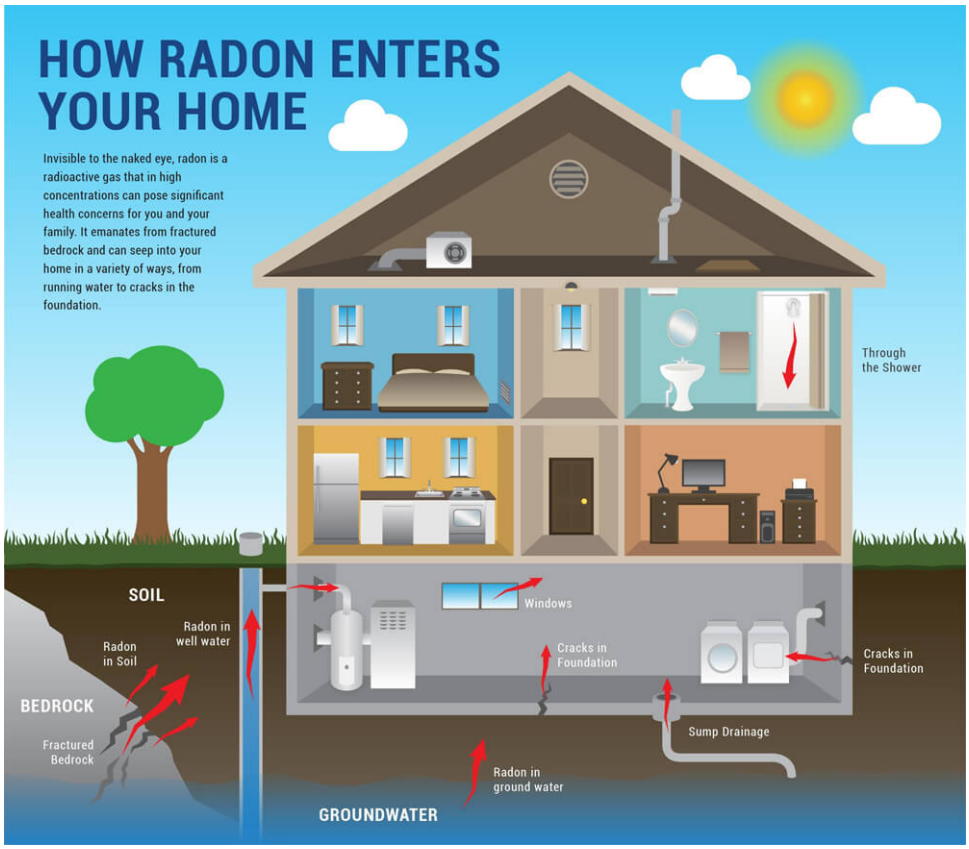
1. Radon test reveals the home has a radon problem.
2. Contact licensed radon mitigation professionals to request bids.
3. Professional does a walk-through of the home to identify the mitigation system to install.
4. Review key questions with professional, and request a proposal.
5. Review bids and select a professional.
6. Professional may perform diagnostic testing to ensure the proper fan size and correct installation.
7. Professional seals cracks and openings in the basement.
8. Professional installs the radon mitigation system.
9. Professional provides a full explanation of how the system operates to the homeowner.
10. Retest the home to ensure the system has reduced radon levels.

## What to look for in an installed system

1. Radon reduction systems must be clearly labeled. This will avoid accidental changes to the system which could disrupt its function.
2. The exhaust pipe(s) of soil suction systems must vent above the surface of the roof and 10 feet or more above the ground and at least 10 feet away from windows, doors, or other openings that could allow the radon to reenter the house, if the exhaust pipe(s) do not vent at least 2 feet above these openings.
3. The exhaust fan must not be located in or below a livable area. For instance, it should be in an unoccupied attic of the house or outside — not in a basement!
4. A u-tube manometer must be installed to alert you if the system stops working properly.
5. A post-mitigation radon test should be done no sooner than 24 hours after your system is in operation with the fan on and last at least 48 hours.
6. Attached written operating and maintenance instructions and copies of any warranties.

## How Radon Enter The Home

**Radon** is a naturally occurring radioactive gas produced by the breakdown of uranium in soil, rock, and water. Because of the difference in pressure, your **house** acts like a vacuum, drawing **radon** in through foundation cracks and other openings. As we try to make our home more air tight, your **home** then traps the **radon** inside, where the concentration level increases over time.




## INSPECTOR PROFILE

Name: **Glenford Blanc**

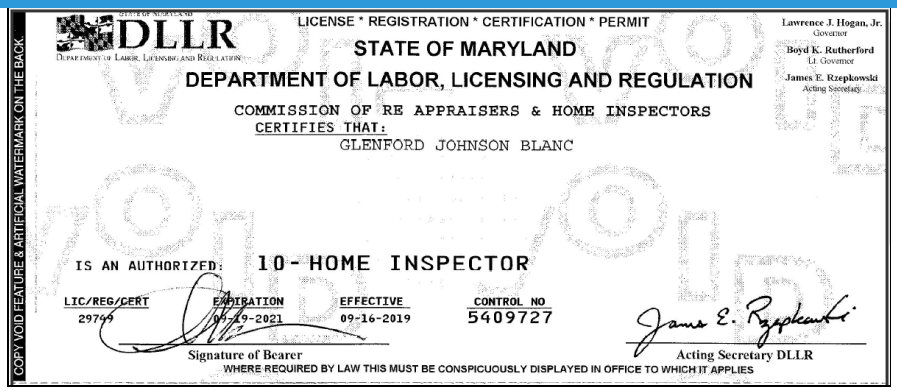
Email Address: **sales@pro-spex.com**

Licence Number: **MD 29749**


Association Information:

| | |
|---|---|
| **InterNachi** | **08111306** |
| **Maryland Association of Home Inspoectors** | **26223446** |
| **National Association of Commercial Building Inspectors** | **NACBI** |

**Inspectors Certification**



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Department of Labor, Licensing and Regulation

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STATE OF MARYLAND
DEPARTMENT OF LABOR, LICENSING AND REGULATION

Lawrence J. Hogan, Jr. Governor
Boyd K. Rutherford Lt. Governor
James E. Rzepkowski Acting Secretary

COMMISSION OF RE APPRAISERS & HOME INSPECTORS
CERTIFIES THAT:
GLENFORD JOHNSON BLANC

IS AN AUTHORIZED: 10- HOME INSPECTOR

| LIC/REG/CERT | EXPIRATION | EFFECTIVE | CONTROL NO |
|---|---|---|---|
| 29749 | 09-19-2021 | 09-16-2019 | 5409727 |

Signature of Bearer

Acting Secretary DLLR

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**Association Logo**

Maryland Association of Home Inspectors

## SUMMARY STATEMENT

## Conclusion

### Conclusion

While no level of radon gas is completely safe, as with most things in life we must balance the benefits and costs to find our own*"acceptable"* levels. We walk outside and work in the sun, exposing ourselves to ultraviolet radiation and increasing our risk of developing skin cancer. We drive in automobiles almost every day even though greater than 1 in 86 deaths is a result of automobile accidents. People smoke, eat poorly, and engage in dangerous behaviors on a daily basis. To some degree, radon gas is another daily risk that we all must take. However, you choose what you eat, whether or not you smoke, and how and when you drive. You have no choice but to breathe the air in your home. A simple and inexpensive radon test can give you the information you need to make an informed decision about what level of radon gas exposure is acceptable to you.

**SINCERELY,**

**PRO SPEX HOME & COMMERCIAL INSPECTION SERVICES**