


# RADON

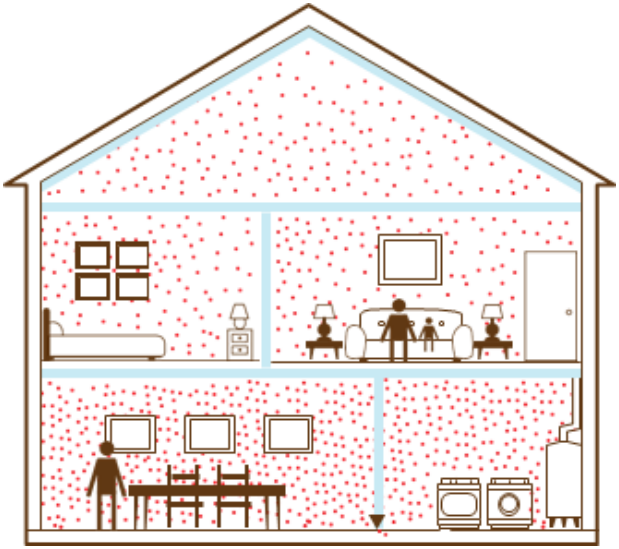
in

# REAL ESTATE & RENTAL TRANSACTIONS

in Colorado

February 2024

More often, informed home buyers and renters are having radon tests performed before finishing the transaction. Discovering elevated radon concentrations doesn't mean you need to walk away from the deal! Testing for and mitigating radon is easy and affordable.



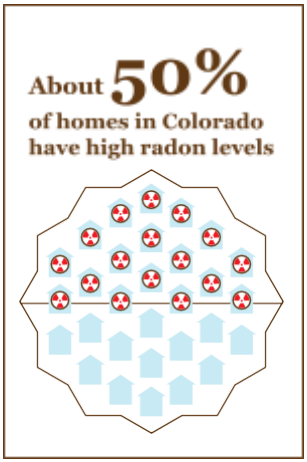
Radon Is an Invisible, Radioactive Gas

# Understanding Radon

## Radon Occurs Naturally

Radon is an invisible, radioactive gas created from natural deposits of uranium and radium in the soil. Radon is easily drawn into homes through cracks and gaps in the foundation and can reach concentrations that increase the potential for developing lung cancer.

Although there are rare cases where radon comes from building materials, the major source of radon in Colorado homes comes from natural deposits of uranium and radium commonly found in Colorado's soil. It is rarely caused by mankind like other environmental concerns.




## Radon Levels are High in Colorado

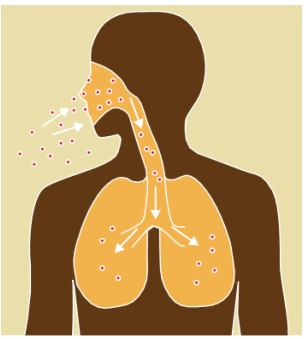
Data collected by the Colorado Department of Public Health and Environment indicates that approximately 50% of homes in Colorado have radon levels higher than the U.S. Environmental Protection Agency (EPA)-recommended action level of 4 picocuries per liter of air (pCi/L). All of Colorado, not just the mountains or foothills, is considered to be at high risk for elevated indoor radon levels.

Radon levels can be elevated in a variety of structures:

- New and old homes.
- Homes built on all types of foundations, including slab-on-grade, crawl spaces, and basements.
- Multifamily buildings

## Radon Exposure Causes Lung Cancer

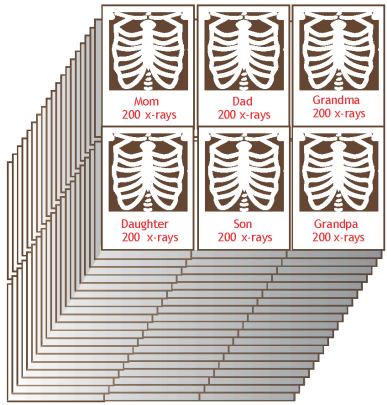
As uranium and radium breaks down in the soil, radon gas is created. Radon is then pulled into homes by a natural stack effect, releasing solid radioactive particles that can be inhaled into your lungs. These particles are referred to as radon decay products.



This radiation can damage your lungs and increase your risk of developing lung cancer.

Residential case-control studies, as well as carefully controlled studies on animals and miners, have shown that prolonged exposure to radon decay products can significantly increase a person's potential for lung cancer.

- Radon is a Class A carcinogen. That means it is known to cause cancer in humans with prolonged exposure. It is in the same class as tobacco products




- The average indoor radon level in the U.S. is about 1.3 pCi/L in air. In Colorado, the average indoor radon level is about 6.4 pCi/L. Living in a home with average levels of radon in Colorado for 1 year is like having more than 200 chest x-rays every year. That's more than 3 chest x-rays per week, per person, per year.

- The United States Surgeon General, the American Lung Association, and the Environmental Protection Agency recommend that people avoid long-term radon exposure at or above 4 pCi/L.

- Every year in the U.S., over 20,000 people die from radon-induced lung cancer. In Colorado, approximately 500 people die annually from radon-induced lung cancer. Long-term residential radon exposure is the second leading cause of lung cancer in the general population (cigarette smoking is the first).

(Field, R. William. 'A Review of Residential Radon Case-Control Epidemiologic Studies Performed in the United States.' Reviews on Environmental Health 16.3 (2001): 151-67. Print.)

# Rental Requirements

## Radon Exposure is Required in Rental Agreements

Before a tenant signs a lease for a rental property, the landlord must provide this brochure to the tenant and provide the tenant with a document with the following information:

- A bold-faced statement that the Colorado Department of Public Health and Environment strongly recommends all tenants have an indoor radon test performed before leasing the property and if elevated levels are found, request the landlord to mitigate.
- Any knowledge the landlord has regarding the radon levels of the property; including previous testing, test results, and information about any installed radon mitigation system.

The tenant should acknowledge receipt of this information by signing the disclosure document. A landlord breaches the warranty of habitability if this disclosure is not made.

A tenant can break the lease if:

- A landlord fails to make this disclosure; or
- A landlord does not make a reasonable effort to mitigate elevated levels of radon (>4pCi/L) within 180 days after being notified that a radon measurement professional has found elevated levels of radon.

On or after January 1, 2026, these remedies will not apply to leases that are one year or less in duration.

## Radon Testing and Mitigation for Renters

- A renter can test their own unit.
- If elevated levels are found, notify the landlord in writing and request mitigation.

- Landlords are not legally required to install a mitigation system.

# Real Estate Transaction Requirements

## Radon Disclosure Is Required in Real Estate Transactions

Section O of the Colorado Seller's Property Disclosure Form specifically lists radon as a hazard that, if known by the seller to exist or ever have existed, must be disclosed. This is true even if previous test results were less than 4 pCi/L. In all cases, sellers should provide copies of any test results to potential buyers. If a radon mitigation system exists, it should also be disclosed, as it is presumed that radon had existed previously, and that if the system were to fail, the radon level would return to its original level.

Home buyers must also be given this brochure and receive a bold-faced recommendation from the Colorado Department of Public Health and Environment to test the property for radon.

**10.13. Radon Disclosure. THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT STRONGLY RECOMMENDS THAT ALL HOME BUYERS HAVE AN INDOOR RADON TEST PERFORMED BEFORE PURCHASING RESIDENTIAL REAL PROPERTY AND RECOMMENDS HAVING THE RADON LEVELS MITIGATED IF ELEVATED RADON CONCENTRATIONS ARE FOUND. ELEVATED RADON CONCENTRATIONS CAN BE REDUCED BY A RADON MITIGATION PROFESSIONAL.**

**RESIDENTAL REAL PROPERTY MAY PRESENT EXPOSURE TO DANGEROUS LEVELS OF INDOOR RADON GAS THAT MAY PLACE THE OCCUPANTS AT RISK OF DEVELOPING RADON-INDUCED LUNG CANCER. RADON, A CLASS A HUMAN CARCINOGEN, IS THE LEADING CAUSE OF LUNG CANCER IN NONSMOKERS AND THE SECOND LEADING CAUSE OF LUNG CANCER OVERALL. THE SELLER OF RESIDENTAL REAL PROPERTY IS REQUIRED TO PROVIDE THE BUYER WITH ANY KNOWN INFORMATION ON RADON TEST RESULTS OF THE RESIDENTIAL REAL PROPERTY.**

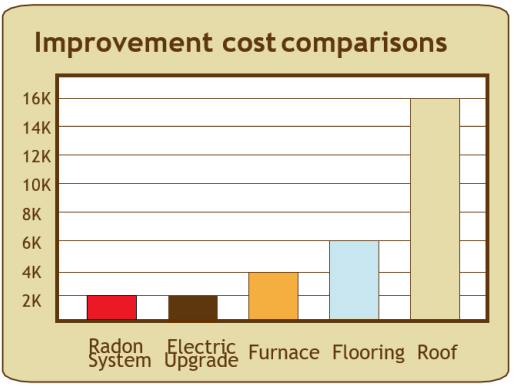
**AN ELECTRONIC COPY OF THE MOST RECENT BROCHURE PUBLISHED BY THE DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH C.R.S. §25-11-114(2)(A) THAT PROVIDES ADVICE ABOUT "RADON AND REAL ESTATE TRANSACTIONS IN COLORADO" IS AVAILABLE AT: HTTPS://CDPHE.COLORADO.GOV/RADON-AND-REAL-ESTATE.**

Radon sections of the Contract to Buy and Sell and the Seller's Property Disclosure

| O. | **RADON**<br>If you know of any of the following **EVER EXISTING,** check the "Yes" column: |
|---|---|
| 1 | Radon test(s) conducted on the Property. Include the most recent records and reports pertaining to radon concentrations within the Property. |
| 2 | Radon concentrations detected or mitigation or remediation performed. Provide a full description. |
| 3 | Radon mitigation system installed on Property. Provide all information known by Seller about the radon mitigation system. |

## Radon Levels Can be Fixed

If radon concerns are discovered during the home inspection process, they can be fixed through mitigation. Normal real estate negotiation procedures can be used to resolve the costs associated with radon mitigation.




# Testing

## Test for Radon During the Inspection Process

At the time of resale, it is important to know what the radon exposure risk could be, independent of how someone else operates or lives in a home. Reliable testing devices and methods exist and are readily available to determine indoor radon levels.

## Select Certified and Licensed Radon Contractors

Lists of certified and licensed radon measurement contractors can be found at www.coloradoradon.info under the "testing and mitigating your home" link. Certified contractors have been trained in the proper placement of radon measurement devices and the interpretation of the results. They use high-quality testing devices that can accurately determine the radon risk of the home.

## Follow These Steps to Ensure Your New Home Will Keep Your Family Safe and Healthy for Years to Come

1. Find the house you want to buy.

2. As part of the home inspection process, request a short-term radon test using a certified and licensed radon measurement contractor. Your home inspector may or may not be qualified to conduct radon testing.

3. If the short-term test result is less than 4 pCi/L, the EPA does not recommend any immediate action; however, consider conducting a long-term test (90 days up to a year) after your family moves into the home, as there is still some risk at exposures less than 4 pCi/L.

4. If the short-term test result is 4 pCi/L or higher, consider asking the seller to pay for a mitigation system. The seller is not legally required to pay for mitigation; this is a negotiation between the buyer and seller, just like any other home repair.

   You can consider purchasing the property and reducing the radon levels after moving into the home. All homes can be fixed!

5. Once you decide to install a mitigation system in the house, seek bids from certified and licensed mitigation contractors who are willing to guarantee the results to below 4 pCi/L.

6. Use bids from certified and licensed contractors as a basis for negotiations with the seller.

7. If the seller is willing to pay for a mitigation system, work with your real estate professional to determine the best way to obtain the funding from the seller and have the system installed by a certified and licensed contractor after taking possession of the property. This will help to ensure that you are happy with the system design.

| Testing Types, Purpose, and Conditions | |
|---|---|
| Potential for Radon Exposure<br>• Short-term test, typically 2-5 days.<br>• Conduct test under closed-house conditions 12 hours prior to start test and throughout the test.<br>• Test lowest potentially livable level of home, even if it is unfinished.<br>• Commonly used at time of resale. | Risk of Exposure Living in Home<br>• Long-term test, typically 91 days up to 1 year.<br>• Conduct test under normal day-to-day living conditions<br>• Test lowest potentially livable level of home, even if it is unfinished.<br>• Commonly used outside of a real estate transaction or as a basis of escrow fund release. |

### If You Love the House, Buy it

Buyers should not be reluctant to buy a home with elevated radon levels. They should take action to reduce radon after they move in. If the radon test results show a potential radon concern, consider doing a long-term test after you move in and before you install a radon mitigation system.

The amount of radon exposure you have depends on where you spend your time. Doing a long-term test after you move in allows you to control the test conditions to better measure your actual radon exposure. If needed, you can then decide with your certified and licensed contractor about the need for mitigation. A long-term test should be placed for a minimum of 91 days up to 1 year after you move into the home.

## Mitigation

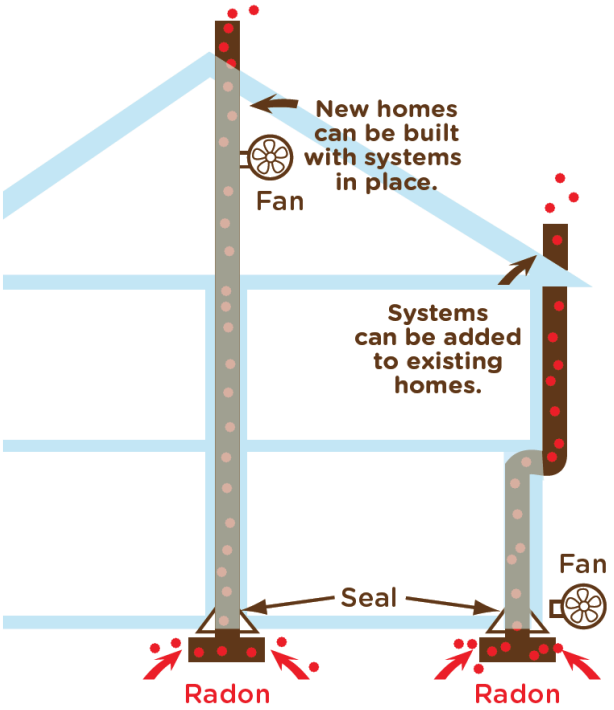
### Reducing Radon is Easy and Inexpensive

Considerable research has been conducted by educational institutions and private industries in Colorado and elsewhere that provides evidence-based practices for mitigating radon in

homes, schools, and commercial buildings. The techniques are straightforward and reliable.

However, mitigation requires more than trying to seal openings in the foundation. In fact, caulking and sealing of foundation openings, on its own, has proven NOT to be a suitable method for reducing radon levels.

Mitigation should be done by a certified and licensed contractor who will install the system according to Radon Mitigation Standards and local building codes. A list of certified and licensed radon mitigation contractors is available at www.coloradoradon.info.




## Mitigation Systems

Radon systems are designed and installed based on the

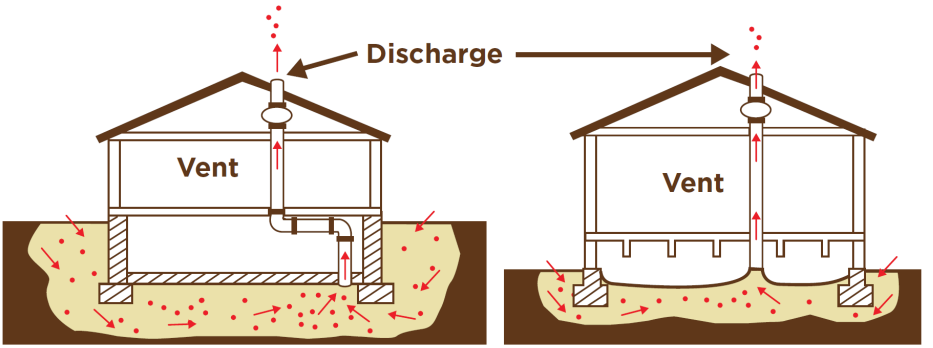
construction of a home, not on the existing radon levels. Radon is mitigated when a system is installed that pulls radon-laden soil gas from underneath the foundation or crawl space and exhausts it outside of the building, far enough away from windows and other openings that it will not re-enter the home.

A mitigation system usually consists of plastic pipe connected to an air pocket surrounded by the soil, either through a hole in the slab, via a sump lid connection, in a perimeter drain, or from beneath a plastic sheet in a crawl space. A quiet, continuously operating fan is attached to the pipe and discharges the radon outdoors.

A home with more than one foundation can present challenges to collecting the soil gas from under all portions of the building. However, qualified mitigation contractors typically can connect multiple systems together so that only one fan is required.

## Crawl Space Systems

For crawl space mitigation systems, contractors need to lay perforated pipe, install plastic sheeting over the piping, seal it to the walls, and then route the piping to the fan. These systems can be more costly; however, the added benefit of reducing moisture in the crawlspace, in addition to reducing radon, can be a significant benefit.



## Costs

It's best to get involved in how the radon mitigation system will be installed if you will be the future occupant of the property. Costs depend on the amount of effort it takes the contractor to conceal the system and maintain the visual appeal of the home. Although a system routed up the outside of the building will reduce radon quite well, it may not be as visually appealing as one that is routed through the interior of the home.

| |
|---|
| Average U.S. installation cost: $1,500 |
| Average operating cost in Colorado: $3/month |
| Expected life span of fan: 8-10 years |
| Fan replacement cost: $145-$300 |
| Periodic maintenance: Test every 2 years |

## Key Elements of Mitigation Systems

The U.S. EPA recommends standards for radon mitigation systems. Your qualified contractor should understand and follow these standards: standards.aarst.org

1. The discharge point of the system must:

    - Be at least 10 feet above grade;
    - Be at least 10 feet away or 2 feet above any opening to the interior of the home; AND
    - Terminate above the eave of the roof.

2. System fans should not be located inside a home, building, or in a crawlspace. They can be in an attic, on the outside of the house, or in the garage (provided there is no living space above the garage).

3. There should be a gauge (manometer) located in a prominent location (inside the home) that will easily show the occupant that the system is functioning properly.

4. Power to the fan should be run in accordance with local electric codes, including permits where required.

5. All portions of the system should be labeled and a simple instruction manual, with warranties, provided to the homeowner.

6. All homes with mitigation systems should be retested no sooner than 24 hours (no later than 30 days) after installation to verify radon mitigation is working and has lowered radon levels to below 4 pCi/L. The home should be retested every two years to make sure the mitigation system is operating properly.

7. If purchasing a home or building with an existing radon mitigation system, it should be tested prior to purchase and every two years to confirm it's working properly.

## Select Certified and Licensed Radon Mitigation Contractors

Lists of these individuals can be found at www.coloradoradon.info under the "testing and mitigating your home" link.

In addition to contractor selection, homeowners should always:

1. Ask for references.

2. Get several bids, as with any home repair.

3. Require proof of certification and licensure or verify these credentials independently.

4. Ask for proof of liability insurance, being bonded, and having all necessary licenses to satisfy local requirements.

5. Ask for a clear contract with a guarantee below 4 pCi/L and

a warranty.

# Radon in New Builds

## Ask for A Radon Mitigation System In New Homes

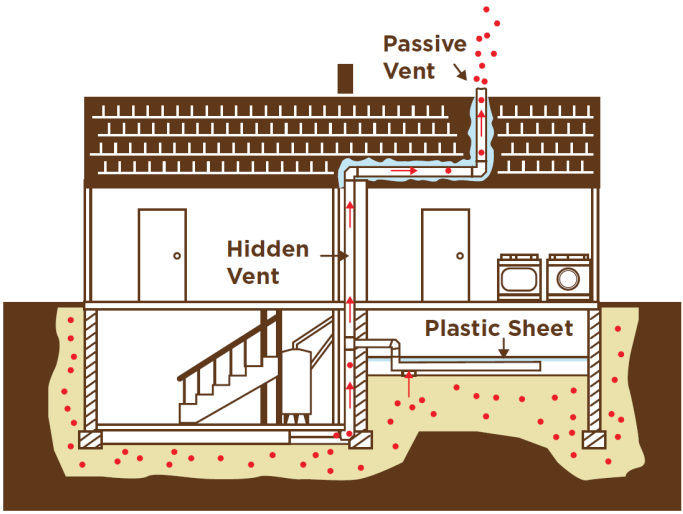
A considerable number of Colorado homebuilders routinely put mitigation systems in homes during the building process. In many locations in Colorado, local building codes require that a radon system be installed in all new homes. Check with your local building department. In areas where it is not a building code requirement, it may be offered as an additional option by the builder.

If you're building a new home:

- Ask your builder to install a radon system during construction.
- Test the home or building after completion to ensure it reduces the radon levels below 4 pCi/l.

Installing a system while a house or building is being constructed can be advantageous because:

- The piping can be easily concealed.
- The vent pipe can exit the roof and appear as a normal roof penetration.
- The subgrade can be prepared to collect radon easily. Multiple foundations (such as in a basement and a crawl space) can be hooked up to a single vent, which also can be concealed in walls.
- When done correctly, the system often works passively, without the need of a fan. (A contractor will route the system vent pipe in such a manner that after the home is tested, if the radon levels are not acceptable, a fan can easily be installed on the vent pipe within the attic to make the system more effective.)




# Radon in Water

## Radon from Groundwater Is a Low Risk

Radon can dissolve in the groundwater and be released into the air of a home when it is used for showers, laundry, and other purposes. Radon in water is not widespread and is primarily an issue with homes whose water supplies are from private wells that use groundwater.

The major concern is not with drinking the water, but rather the increased amount of radon added into the indoor air in addition to radon coming from the soil. Normal radon-in-air tests will measure this contribution if the house is occupied during testing. It takes a lot of radon in the water to have a measurable effect on indoor radon concentrations. As a rule, it takes 10,000 pCi/L in the water to add 1 pCi/L of radon to the air in the home. Always test the air first before testing or becoming concerned about radon in the water.

Radon in water test kits may be purchased online or at most home improvement stores. Find a list of contractors who mitigate radon in water, refer to www.coloradoradon.info.

## Find Out More

Additional Information About Radon Is Available at:

- Colorado Department of Public Health and Environment: www.coloradoradon.info
- United States Environmental Protection Agency: www.epa.gov/radon
- Your local health department: cdphe.colorado.gov/public-information/find-your-local-public-health-agency




COLORADO

**Hazardous Materials & Waste Management Division**

Department of Public Health & Environment

4300 Cherry Creek Drive South
Denver, CO 80246-1530
1-800-846-3986

www.coloradoradon.info