

Understanding Radon in Basement: Why Jefferson County Homeowners Should Test

Not long ago, I got a call from a family in Arnold. They had finished their basement into a nice rec room, complete with carpet and a pool table. A few months later, their kids started complaining about headaches and a funny smell. The family's first thought was mold, but after a few questions I suggested they test for radon gas instead. That call turned into one of the more eye-opening afternoons I've spent in a crawlspace.

Radon is a radioactive gas that comes from the natural breakdown of uranium in soil and rock. It has no color, no taste, and no odor. The only way to know if it's present is to measure it. In Jefferson County, where homes sit on a mix of limestone and shale, the geology is prime for radon production. That's why so many houses in places like Festus, High Ridge, and Hillsboro end up with elevated levels. The gas seeps up through the ground and finds the easiest path inside, which is almost always through the lowest level of the home.

That path is why [radon in basement](#) areas is such a common problem. The basement is the part of the house that sits directly on the soil. Even a well-sealed foundation has tiny cracks, gaps around pipes, and openings where the floor meets the wall. Radon gas moves through those openings like air through a straw. Once it's inside, it can build up to levels that pose a real health risk. The EPA estimates that radon causes thousands of lung cancer deaths each year, and the risk goes up the longer you breathe it.

I've walked through hundreds of basements in this county, and I can tell you that finish level does not matter. A dirt-floor cellar can have the same radon reading as a drywalled home theater. The difference is that people spend more time in a finished basement, so their exposure is higher. That's why the EPA recommends testing every home, regardless of age or construction type. A radon test kit is cheap and easy to use. You place it in the lowest lived-in level, leave it for the required time, and send it to a lab. The results come back in days.

Why Basements Trap Radon

Basements are essentially big boxes dug into the ground. The walls and floor are in constant contact with soil. Even with a vapor barrier and poured concrete, the concrete itself is porous. Radon gas molecules are small enough to pass through. Add in the fact that basements often have lower air pressure than the soil around them, and you get a natural suction effect. That's called the stack effect, and it pulls radon in basement spaces more aggressively than it does in upper floors.

I remember a house in High Ridge where the homeowners had lived there for fifteen years without ever testing. They had a finished basement with a bedroom, a bathroom, and a small office. The radon level came back at 8.2 picocuries per liter. The EPA action level is 4.0. That family had been sleeping in a room with double the recommended limit. They had no idea because there were no symptoms. No smell, no stain on the wall, nothing. That's the scary part about radon. It does its damage silently.

Testing Is the First Step

The good news is that testing is straightforward. You can buy a radon test kit at most hardware stores or order one online. The CR 212 is a common short-term test kit that works well for initial screening. You place it in the basement for two to seven days, then mail it to a lab. Make sure the test is set up in a room that is used regularly, not in a storage closet or a utility area. Keep windows and doors closed as much as possible during the test, especially in the basement. That gives you a reading that reflects the worst-case breathing conditions.

If the test comes back at 4.0 pCi/L or higher, the EPA recommends taking action. That action is radon mitigation. In Jefferson County, that usually means installing a sub-slab depressurization system. This is the most reliable method for reducing radon in basement levels. It works by creating a vacuum under the concrete slab. A radon fan pulls the soil gas from beneath the house and vents it above the roofline, where it disperses harmlessly. The system includes a manometer, which is a simple pressure gauge that shows whether the fan is working. You check it once a month, and that's about the only maintenance required.

What Mitigation Looks Like

I've installed dozens of these systems in Arnold, Festus, High Ridge, and Hillsboro. The process starts with a site visit. We look at the foundation type, the sump pump if there is one, the floor drain, and the condition of the slab. Then we drill a small hole through the basement floor, usually near a wall or in a utility closet. We insert a pipe that goes into the gravel or soil below the slab. That pipe runs up to an attic or outside wall, where the radon fan is mounted. The fan runs continuously. The vent pipe exits above the roof line, far from any windows or air intakes.

Sealing is part of the process too. We fill cracks in the floor, seal around the sump pump cover, and caulk the gap where the floor meets the wall. But sealing alone is rarely enough. Soil suction is what actually moves the gas away. Think of it as giving the radon an easier path out than in. The fan does the work. The sealing just keeps the system efficient.

After the system is installed, we do a post-mitigation test. That's the only way to confirm the radon levels have dropped. I've seen readings go from 12 pCi/L down to 1.2 pCi/L after a proper sub-slab system is in place. That kind of drop makes a real difference for the people

living in that house. It's one of the few things in home maintenance that can measurably reduce your cancer risk.

Cost, Maintenance, and Peace of Mind

A radon mitigation system is not cheap, but it is far less expensive than most major home repairs. The cost depends on the house layout, the type of foundation, and how far the vent pipe has to run. Most systems in this area fall in the range of a few thousand dollars. The fan uses about the same electricity as a 40-watt light bulb. The manometer should be checked monthly, and the fan itself may need replacement after five to ten years. That's it. Once the system is running, it works around the clock with very little attention.

I've had homeowners tell me they sleep better after mitigation. That's not just a metaphor. One couple in Festus said their daughter's asthma seemed to improve after they fixed the radon problem. I can't prove a connection, but I can tell you that reducing any indoor air contaminant is good for your lungs. The same system that pulls radon out also pulls out other soil gases like methane and volatile organic compounds. So you get a cleaner basement overall.

Who Should Test

Every home with a basement should be tested for radon. That includes houses with crawl spaces, slab-on-grade foundations, and basements that are only used for storage. The EPA's map shows Jefferson County in Zone 1, which means the average indoor radon level is predicted to be above the action level. That's a statistical average, not a guarantee for any single house. The only way to know your home's level is to test it. I've tested houses side by side where one was fine and the other was through the roof. Geology can vary a lot in just a few hundred feet.

If you live in Arnold, Festus, High Ridge, or Hillsboro, and you haven't tested your basement, I'd recommend making that a priority. A radon test kit is a small investment for information that could protect your family for decades. If the test shows elevated levels, call a professional who is certified in radon mitigation. Air Sense Environmental handles testing and mitigation for this area, and they know the local soil conditions and construction styles. They'll walk you through the steps from test to fix.

Radon is not something to panic about, but it is something to act on. The science is clear. The solutions are proven. The only mistake is not knowing what's in your basement. A simple test can give you the answer, and if the answer is high, a radon system can bring it down. That's the whole story. Test, fix if needed, and then forget about it. Your basement will be a healthier place for everyone who uses it.