


# Understanding Radon when Buying and Selling



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Carroll & Agostini

Mitchel Agency

Valley Properties

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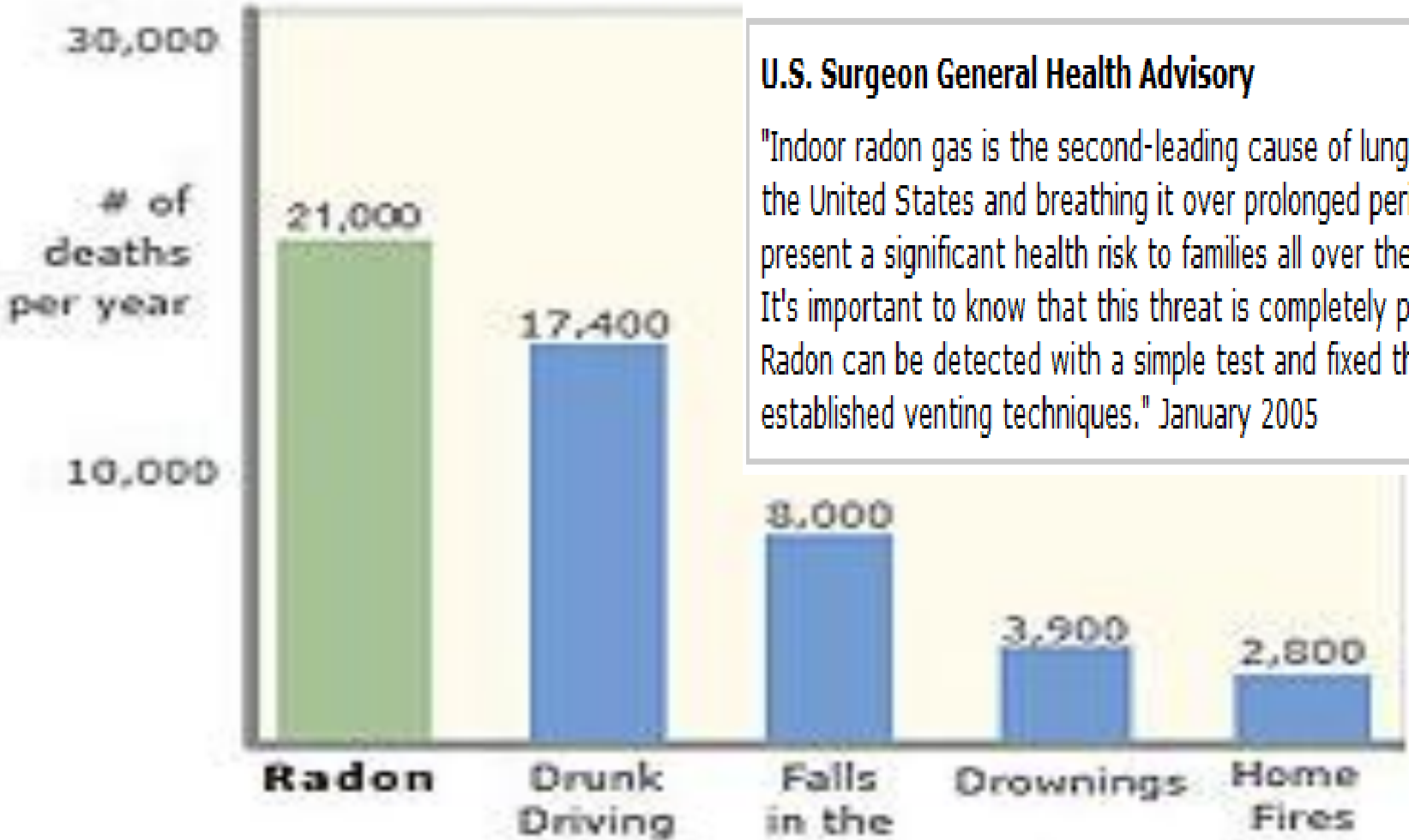
# Health Hazard with a Simple Solution

- The U.S. Surgeon General and EPA recommend that all homes be tested
- Radon is a cancer-causing natural radioactive gas that you can't see, smell or taste which poses a danger to your family's health
- **Exposure to Radon Causes Lung Cancer In Non-smokers and Smokers Alike.** Radon is the leading cause of lung cancer among non-smokers and is the second leading cause of lung cancer in America and claims about 20,000 lives annually
- **Test Your Home for Radon - It's Easy and Inexpensive** Fix your home if you have a radon level of 4 pCi/L or more



*Realty3 Carroll & Agostini – Mitchel Agency – Valley Properties*  
**Radon causes thousands of cancer deaths in the US each year**

**Radon Health Risk**



**U.S. Surgeon General Health Advisory**  
"Indoor radon gas is the second-leading cause of lung cancer in the United States and breathing it over prolonged periods can present a significant health risk to families all over the country. It's important to know that this threat is completely preventable. Radon can be detected with a simple test and fixed through well-established venting techniques." January 2005

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## Radon Risk If You Smoke

Radon Level	If 1,000 people who smoked were exposed to this level over a lifetime*...	The risk of cancer from radon exposure compares to**...	WHAT TO DO: Stop smoking and...
20 pCi/L	About 260 people could get lung cancer	250 times the risk of drowning	Fix your home
10 pCi/L	About 150 people could get lung cancer	200 times the risk of dying in a home fire	Fix your home
8 pCi/L	About 120 people could get lung cancer	30 times the risk of dying in a fall	Fix your home
4 pCi/L	About 62 people could get lung cancer	5 times the risk of dying in a car crash	Fix your home
2 pCi/L	About 32 people could get lung cancer	6 times the risk of dying from poison	Consider fixing between 2 and 4 pCi/L
1.3 pCi/L	About 20 people could get lung cancer	(Average indoor radon level)	(Reducing radon levels below 2 pCi/L is difficult.)
0.4 pCi/L	About 3 people could get lung cancer	(Average outdoor radon level)	

Note: If you are a former smoker, your risk may be lower.

\* Lifetime risk of lung cancer deaths from EPA Assessment of Risks from Radon in Homes (EPA 402-R-03-003).

\*\* Comparison data calculated using the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Reports.

## Radon Risk If You've Never Smoked

Radon Level	If 1,000 people who never smoked were exposed to this level over a lifetime*...	The risk of cancer from radon exposure compares to**...	WHAT TO DO:
20 pCi/L	About 36 people could get lung cancer	35 times the risk of drowning	Fix your home
10 pCi/L	About 18 people could get lung cancer	20 times the risk of dying in a home fire	Fix your home
8 pCi/L	About 15 people could get lung cancer	4 times the risk of dying in a fall	Fix your home
4 pCi/L	About 7 people could get lung cancer	The risk of dying in a car crash	Fix your home
2 pCi/L	About 4 person could get lung cancer	The risk of dying from poison	Consider fixing between 2 and 4 pCi/L
1.3 pCi/L	About 2 people could get lung cancer	(Average indoor radon level)	(Reducing radon levels below 2 pCi/L is difficult.)
0.4 pCi/L		(Average outdoor radon level)	

Note: If you are a former smoker, your risk may be higher.

\* Lifetime risk of lung cancer deaths from EPA Assessment of Risks from Radon in Homes (EPA 402-R-03-003).

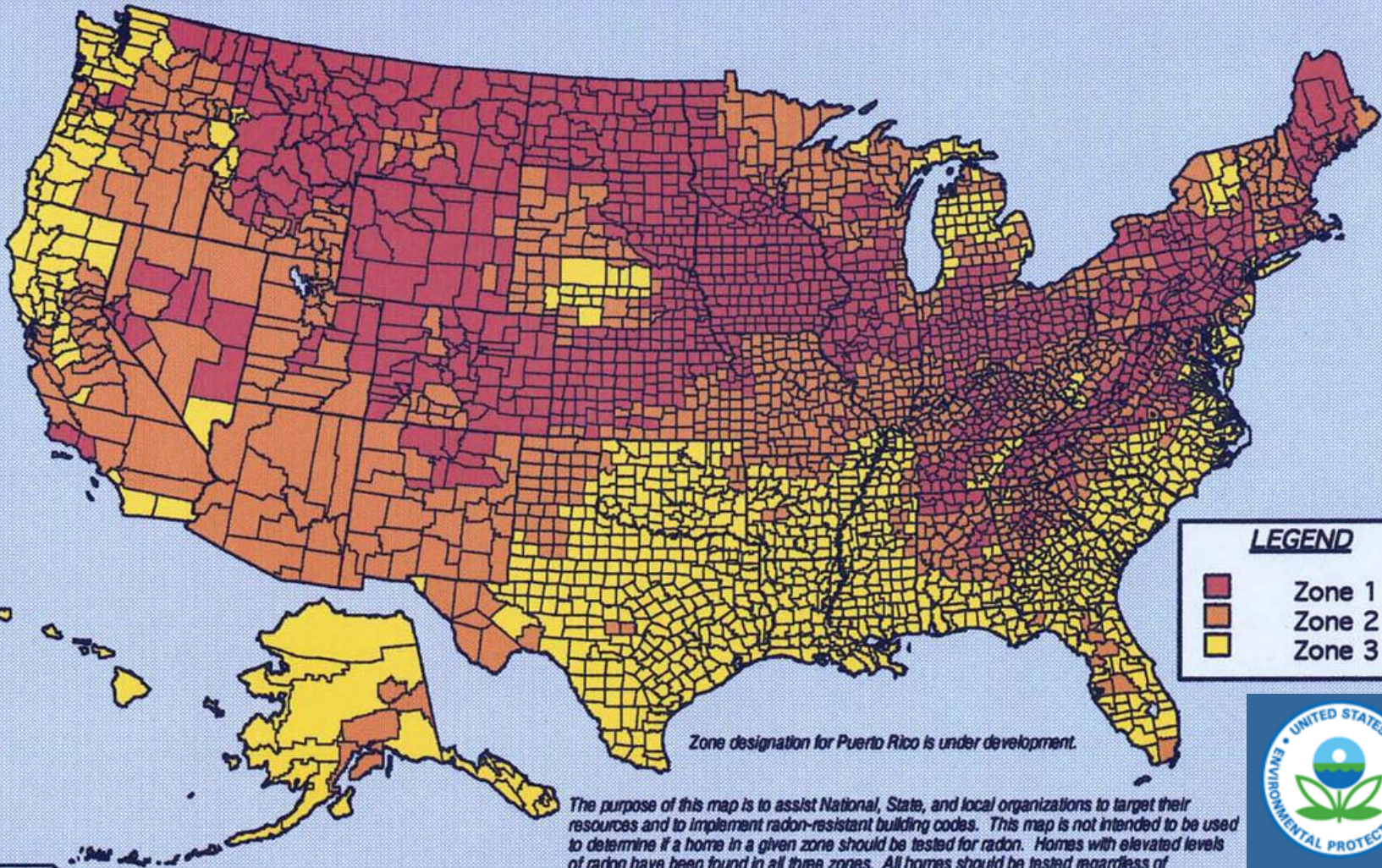
\*\* Comparison data calculated using the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Reports.



# How does a home get Radon?

- Radon is a radioactive gas that comes from the natural breakdown of uranium in soil, rock and water and gets into the air you breathe
- Radon typically moves up through the ground into your home through cracks and other holes in the foundation. Radon can also enter your home through well water.
- Any home can have a radon problem. This means new and old homes, well-sealed and drafty homes, and homes with or without basements
- Nearly 1 out of every 15 homes in the United States is estimated to have an elevated radon level (4 pCi/L or more). Elevated levels of radon gas have been found in homes in your state

## EPA Map of Radon Zones



**LEGEND**

- Zone 1
- Zone 2
- Zone 3



Zone designation for Puerto Rico is under development.

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 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 regardless of geographic location.

**IMPORTANT :** Consult the EPA Map of Radon Zones document (EPA-402-R-93-071) before using this map. 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.

Guam - Preliminary Zone designation



# US Elevated Radon Zone Map

- All homes should be tested regardless of location because homes with elevated levels of radon have been found in all three zones
- **The map should not be used in lieu of testing during real estate transactions**
- The map was developed using five factors to determine radon potential: indoor radon measurements; geology; aerial radioactivity; soil permeability; and foundation type
- To find your state go to: <http://www.epa.gov/radon/zonemap.html>



# Types of Testing Devices

Short-Term Testing Options	What to do Next
<p><b>Passive:</b> Take two short-term tests at the same time in the same location for at least 48 hours.</p> <p><i>or</i></p> <p>Take an initial short-term test for at least 48 hours. Immediately upon completing the first test, do a second test using an identical device in the same location as the first test.</p>	<p>Fix the home if the average of two tests is 4 pCi/L or more.</p>          <p>Fix the home if the average of the two tests is 4 pCi/L or more.</p>
<p><b>Active:</b> Test the home with a continuous monitor for at least 48 hours.</p>	<p>Fix the home if the average radon level is 4 pCi/L or more.</p>



# Preventing Test Interference

In real estate transactions there are several ways to prevent or detect test interference:

- Use an active device that frequently records radon or decay product levels to detect unusual swings;
- Employ a motion detector to determine whether the test device has been moved or conditions have changed;
- Record the barometric pressure to identify weather conditions and record the temperature to help assess whether doors and windows have been opened;
- Apply tamper-proof seals to windows to ensure closed house conditions;
- Have the seller sign a non-interference agreement
- Home buyers and sellers should consult a qualified radon test provider about the use of these precautions



# During the Radon Testing

- Closed-house conditions requires keeping all windows closed, keeping doors closed except for normal entry and exit, and not operating fans or other machines which bring in air from outside
- Maintain closed-house conditions during the entire time of a short term test, especially for tests shorter than one week in length
- Operate the home's heating and cooling systems normally during the test.
- For tests lasting less than one week, operate only air-conditioning units which re-circulate interior air
- Do not disturb the test device at any time



# After the Radon Test

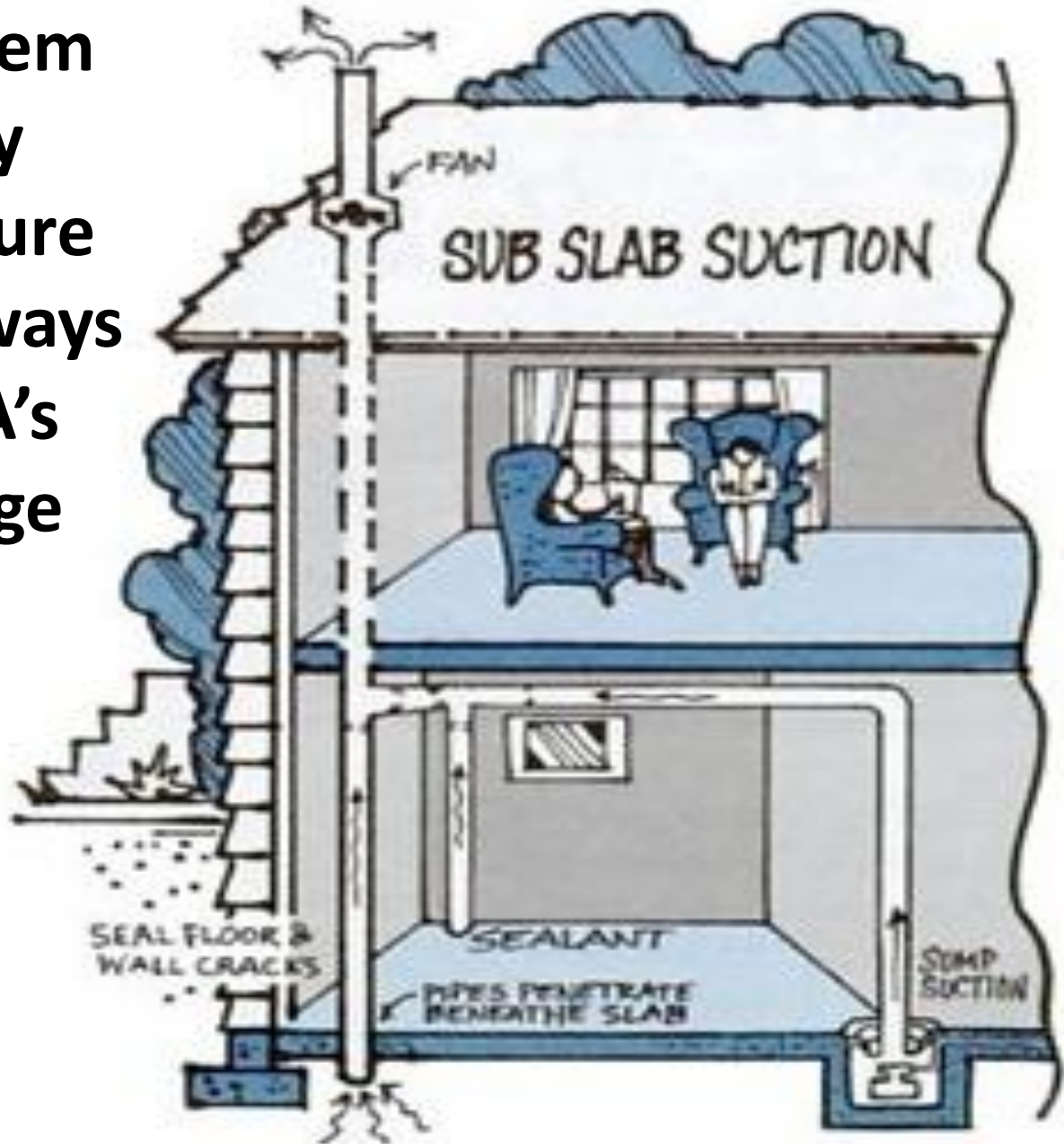
- If you conduct the test yourself, be sure to promptly return the test device to the laboratory
- Be sure to complete the required information, including start and stop times, test location, etc.
- If an elevated level is found, contact a qualified radon-reduction contractor to lower the level
- Be sure that you or the radon tester can demonstrate or provide information to ensure that the testing conditions were not violated
- EPA recommends that you fix the home when the radon level is 4 pCi/L or more



# Remediation

- A variety of methods can be used to reduce radon in homes. Sealing cracks and other openings in the foundation is part of most approaches to reduction
- EPA does not recommend the use of sealing alone to limit radon entry since it has not been shown to lower radon levels significantly or consistently
- A system with a vent pipe(s) and fan(s) is used to reduce radon. These "sub-slab depressurization" systems do not require major changes to your home
- Similar systems can be installed in homes with a crawl space to prevent gas from entering from below the concrete floor and from outside the foundation

**Mitigation System  
automatically  
operates to insure  
that radon is always  
within the EPA's  
suggested range**





# Evaluating a Contractor

- Will the contractor provide references and test results of 'before'/'after' levels of past work?
- Can the contractor explain what the work will involve, how long it will take to complete, and exactly how the system will work?
- Did the contractor inspect your home's structure before giving you an estimate? Does the contractor charge a fee for any diagnostic tests?
- Did the contractor review the quality of your radon measurement results and determine if appropriate testing procedures were followed?



# Does the Proposal Include

- Proof of state certification and/or professional proficiency or certification credentials?
- Proof of liability insurance and having all necessary licenses to satisfy local requirements?
- Diagnostic testing prior to design & installation?
- Warning device to caution you if the radon reduction system is not working correctly?
- Testing after installation to make sure the radon reduction system works well?
- A guarantee to reduce radon levels to 4 pCi/L or below, and if so, for how long?

# Approximate Installation and Operating Costs

**Installation and Operating Cost Table**

<b>Technique</b>	<b>Typical Radon Reduction</b>	<b>Typical Range of Installation Costs (Contractor)</b>	<b>Typical Operating Cost Range for Fan Electricity &amp; Heated/ Cooled Air Loss (Annual)</b>	<b>Comments</b>
<b>Subslab Suction (Subslab Depressurization)</b>	50 - 99%	\$800 - \$2,500	\$50 - \$200	Works best if air can move easily in material under slab.
<b>Passive Subslab Suction</b>	30 - 70%	\$550 - \$2,250	There may be some energy penalties	May be more effective in cold climates; not as effective as active subslab suction.
<b>Drain tile Suction</b>	50 - 99%	\$800 - \$1,700	\$50 - \$200	Can work with either partial or complete drain tile loops.
<b>Blockwall Suction</b>	50 - 99%	\$1,500 - \$3,000	\$100 - \$400	Only in houses with hollow blockwalls; requires sealing of major openings.
<b>Sump Hole Suction</b>	50 - 99%	\$800 - \$2,500	\$50 - \$250	Works best if air moves easily to the sump under the slab.
<b>Submembrane Depressurization in a Crawlspace</b>	50 - 99%	\$1,000 - \$2,500	\$50 - \$250	Less heat loss than natural ventilation in cold winter climates.
<b>Natural Ventilation in a Crawlspace</b>	0 - 50%	none \$200 - \$500 if additional vents installed	There may be some energy penalties.	Costs variable
<b>Sealing of Radon Entry Routes</b>	See Comments	\$100 - \$2,000	None	Normally only used with other techniques; proper materials & installation required
<b>House (Basement) Pressurization</b>	50 - 99%	\$500 - \$1,500	\$150 - \$500	Works best with tight basement isolated from outdoors & upper floors.
<b>Natural Ventilation</b>	Variable/ Temporary	None \$200 - \$500 if additional vents installed	\$100 - \$700	Significant heated/cooled air loss; operating costs depend on utility rates & amount of ventilation.
<b>Heat Recovery Ventilation (HRV)</b>	Variable/ See Comments	\$1,200 - \$2,500	\$75 - \$500 for continuous operation	Limited use; effectiveness limited by radon concentration and the amount of ventilation air available for dilution by the HRV. Best applied to limited-space areas like basements.
<b>Private Well Water Systems: Aeration</b>	95 - 99%	\$3,000 - \$4,500	\$50 - \$150	Generally more efficient than GAC; requires annual cleaning to maintain effectiveness and to prevent contamination; requires venting radon to outdoors.
<b>Private Well Water Systems: Granular Activated Carbon (GAC)</b>	85 - 99%	\$1,000 - \$3,000	None	Less efficient for higher levels than aeration; use for moderate levels (around 5,000 pCi/L or less in water); radioactive radon by-products can build on carbon; may need radiation shield around tank & care in disposal.



# Radon Hotlines

EPA supports the following hotlines to best serve consumers with radon-related concerns

- **1-800-SOS-RADON (767-7236)\*** Purchase test kits
- **1-800-55RADON (557-2366)\*** Questions
- **1-800-644-6999\*** Radon Fit-It Hotline. For general info on fixing/reducing levels in your home
- **1-866-528-3187\*** Línea Directa de Información sobre Radón en Español
- **1-800-426-4791** Safe Drinking Water Hotline. For general information on drinking water, radon in water, testing and treatment, and standards for radon drinking water. Operated under a contract with EPA



# Additional Resources

- The right system depends on the design of your home and other factors
- Radon mitigation contractors may use other methods that may also work in your home
- Techniques for reducing radon are discussed in EPA's ["Consumer's Guide to Radon Reduction."](#)  
As with any other household appliance, there are costs associated with the operation of the radon-reduction system



# About Realty3

- Realty3 is a large independent firm with a local presence and an International Network
  - Offices to serve you throughout the Central CT and CT Shoreline areas
- Realty3 is a full service real estate firm with the following divisions:
  - Residential, Commercial, Foreclosure, International & US Relocation, Auction, Rentals, New Construction, Property Management
- Our highly skilled professionals are ready to help you with any of your real estate needs