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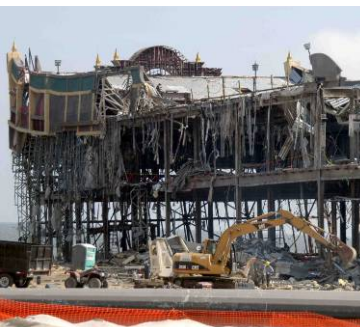
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# Radon Zones in Florida

## Areas of Concern and Recommended Mitigation Strategies

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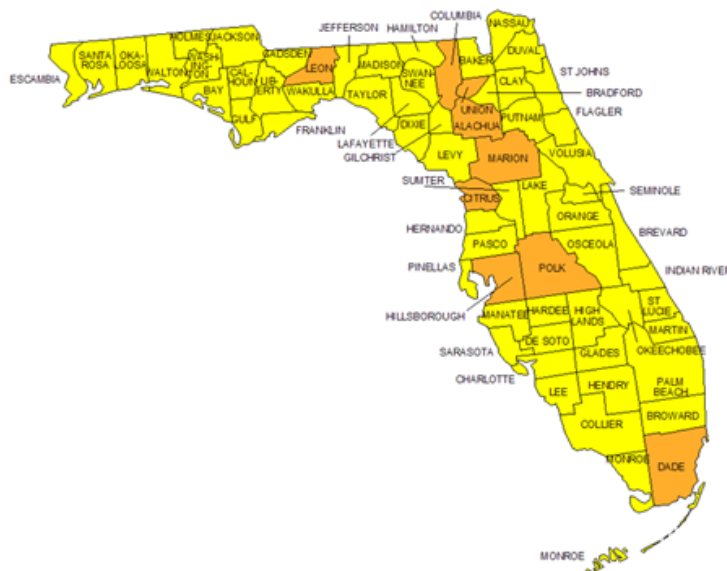
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Radon is a naturally occurring, invisible, odorless, tasteless, radioactive gas produced from the radioactive decay of radium, found in most soils and earthen construction materials. Radon is the second leading cause of lung cancer in the U.S. after smoking, and the leading cause of lung cancer among non-smokers. The United States Environmental Protection Agency (EPA) estimates that radon is responsible for more than 21,000 lung cancer deaths per year.

Based on EPA's national residential radon survey completed in 1991\*, the average indoor radon level is about 1.3 picocuries per liter (pCi/L) in air in the United States, while the average outdoor level in the United States is about 0.4 pCi/L. The EPA Action Level is 4.0 pCi/L and above.

There are thousands of individual homes across the U.S. with elevated radon levels in Zone 2 and 3. One state is of particular concern - Florida. According to the EPA Map of Radon Zones for Florida, the state does not contain any counties in Zone 1 containing the highest levels of radon. However, the map shows 58 counties in Zone 3 and nine counties in Zone 2.



	<b>Zone 1 - Hig hest Potential:</b> counties have a predicted average indoor radon screening level greater than 4 pCi/L (pico curies per liter) <b>(red zones)</b>
	<b>Zone 2 - Moderate P otential:</b> counties have a predicted average indoor radon screening level between 2 and 4 pCi/L <b>(orange zones)</b>
	<b>Zone 3 - Low Po tential:</b> counties have a predicted average indoor radon screening level less than 2 pCi/L <b>(yellow zones)</b>

According to another source, the Florida Department of Health, Division of Environmental Health, identifies five (5) counties in Zone 1, with 1 in 5 Florida residences having elevated radon levels. While Florida's soils have naturally occurring radioactivity, these elevated levels can be attributed primarily to phosphate mining. It is well documented that old phosphate mines in Florida generate elevated radon concentrations within several miles of the mines, especially on

\*Source: United States Environmental Protection Agency, <http://www.epa.gov/radon/>

reclaimed land. The mining process takes what is underground (soils and rock) and puts it at the surface. In doing so, some of the radioactive elements that were buried underground are exposed.

Studies of homes built in the phosphate mining region indicate an increase of up to a few pCi/L in homes built directly on mined lands. Highest indoor radon progeny levels are associated with the slab-on-grade type of construction. Results of a 1983 study\* show that about 25% of the land produced by present methods of mining and reclamation practices would require restrictions on the type of construction or would require special construction methods.

There are various methods to prevent radon entry into homes or reduce radon concentrations after entry. These modifications are not required by law and contractors don't usually include them in a house design. The EPA has a Radon Contractor Proficiency (RCP) Program to certify contractors in these methods. Most often house modifications are made when residents of an existing home have the house radon tested and find the radon level is too high for their comfort.

Testing for radon is easy and inexpensive. Because of the conditions and the resulting elevated radon levels in Florida, the state has a mandatory radon testing program for specific public facilities, including public and private schools, state licensed day care centers, and 24-hour care facilities such as nursing homes and hospitals. However, according to the EPA, all homes and public facilities should test for radon, regardless of geographic location or zone designation. Specifically, single family residential buildings with averages of 4.0 pCi/L should undergo mitigation, which can cost \$500 to \$2500, depending on the modification needed. Multifamily residential buildings can cost between \$2,000 and \$8,000 per building, depending on the foundation and size. An example of a good mitigation system for slab-on-grade home construction is called sub-slab ventilation. With that system a pressure differential is used to draw air from under the house and vent it out before the radon gas can enter through cracks in the floor. Radon gas can be easily reduced to outdoor levels by opening a window(s) to let the outside air mix in and the radon level reach equilibrium with the atmosphere. Doing this about every other day would solve the problem for most houses; however, this should only be considered as a temporary measure, until a mitigation system is installed. Any air handling system that exchanges air with the outside environment also helps. Ventilation is more of a problem in colder climates where people close their homes tightly through many cold months.

It also helps to consult with builders and/or contractors prior to commencement of construction using radon-resistant new construction (RRNC) techniques. Radon-resistant new construction typically costs a builder between \$250 and \$750. RRNC could cost less than \$250 if the builder already uses some of the same techniques for moisture control.

The only way to know if you have a radon problem is to test for it. EFI Global can assist you in this process. Our professionals have performed radon surveys throughout the U.S. for more than 14 years, and are ready to assist with your radon testing needs on a local and national scale. Our experts include Professional Geologists, Professional Engineers, Environmental Professionals and state-licensed Radon Technicians and/or Mitigators.

For more information on how EFI Global can assist with your radon testing needs, please contact Mandeep S. Sandhu at (732) 256-9111 or [Mandeep\\_Sandhu@efiglobal.com](mailto:Mandeep_Sandhu@efiglobal.com).

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\*Source: Information obtained from <http://www.ncbi.nlm.nih.gov/pubmed/6885438>, Indoor Radon Progeny Exposure in the Florida phosphate mining region: a review. [Roessler CE](#), [Roessler GS](#), [Bolch WE](#).