

Submission
No 23

FORMER URANIUM SMELTER SITE, HUNTER'S HILL

Name: Mr Benjamin Nurse

Date received: 2/07/2008

Benjamin Nurse

DATE: 30th June 2008

Reference : FORMER URANIUM SMELTER SITE HUNTERS HILL (INQUIRY)

Dear Sir

I wish to make a submission regarding the above Inquiry. I am also prepared to appear at the hearings if you wish me.

History

1. I built the house at 11 Nelson Parade Hunters Hill

2. When we purchased the land, our Solicitors obtained a clear Certificate from the Health Department. We actually paid I think about \$30 for it.

About 1975, we heard that a Professor from the Blue Mountains was investigating a cluster of cancers from Nelson Parade Hunters Hill.

We found out that the area had been used refine radium oxide from Pitch Blend. in the mid 1910's.

The ore was brought from South Australia by ship and unloaded on a wharf below Nelson Parade.

The radium Oxide was sent to France to Madame Currie.

The refined Radium Oxide represented 1% of the total mined Pitchblend.

A richer deposit of Pitchblend was found in Canada. Madame Curie then purchased her Radium Oxide from Canada. As a consequence the plant was closed down.

During the refining, the waste product uranium oxide was spread around the site. We also understand that large quantities were used as filling around Hunters Hill and further.

The Health Department found high levels of radioactivity sometimes on the surface and certainly below the ground.

The Health Department (The Crown) could not be sued, but eventually decided to buy the property at Valuer Generals Valuation. Because it was then classed as unhealthy land the property was valued at one third of its previous value.

The opinion of many it was unlivable so we accepted the offer.

Observations.

The Health Department was not competent to handle the problems at Hunters Hill.

It had to lease radon testing equipment from USA. It did not do long term readings of Radon. Uranium Mines and in fact the PostMaster-General had radon measuring equipment.

Conclusion

I have attached Documents from USA, where they considered Radon to be extremely dangerous and recommend all houses be tested even though radon in small amounts come from the ground and building materials. In USA a large portion of lung cancer is caused by Radon gas.

The area in Nelson Parade and areas where the Uranium Oxide tailings have been

dumped would produce Radon far in excess of the normal.

I suggest that radon testing gear be given to residents of Hunters Hill and areas where tailings have been dumped to test for Radon Gas. Basements, playrooms and even under single storey houses are likely high levels of Radon.

Cancers caused by radiation come in many forms, in fact our daughter suffered from thyroid cancer (Hashimoyo's thyroiditis) caused by radiation.

Yours Sincerely

Ben Nurse



References Supplied:

A Citizen's Guide to Radon: The Guide to protecting Yourself and Your Family from

Radon. by The USA Environmental Agency

Radon Facts: by Airchek USA

Gas Sniffers, Radon Dectectors USA



Radon

You are here: [EPA Home](#) [Air](#) [Indoor Air Quality](#) [Radon](#) [Publications](#) A Citizen's Guide to Radon

http://www.epa.gov/radon/pubs/citguide.html

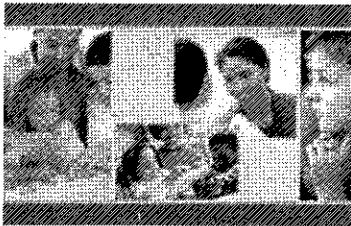
Last updated on Tuesday, June 24th, 2008.

A Citizen's Guide to Radon: The Guide to Protecting Yourself and Your Family from Radon

Indoor Environments Division
(6609J)

EPA 402-K-07-009,
Revised May 2007

EPA A Citizen's Guide
To Radon
EPA The Guide To Protecting
Yourself And Your Family
From Radon



www.epa.gov/radon/pubs/citguide.html

Contents

- [Overview](#)
- [How Does Radon Get Into Your Home?](#)
- [How to Test Your Home](#)
 - [Short-term Testing](#)
 - [How to use a test kit](#)
 - [Long-term Testing](#)
- [What Your Test Results Mean](#)
 - [Radon and Home Sales](#)
 - [Radon in Water](#)
- [How to Lower the Radon Levels in Your Home](#)
- [The Risk of Living With Radon](#)
- [Radon Risk Charts](#)
- [Radon Myths](#)
- [For Further Information](#)
 - [Hotlines](#)
 - [EPA Regional Offices](#)
 - [EPA Publications](#)
 - [State Radon Offices](#)
 - [Tribal Radon Program Offices](#)

[PDF Version](#) (PDF, 16 pp, 856MB, [About PDF](#))

Manual Informativo Sobre El Radón, La Guía para proteger a su familia y a usted del radón

Esta publicación para el sitio Web es la traducción al español de "A Citizen's Guide to Radon". Este manual le ofrece información sobre los riesgos debido a la exposición al gas radón y aclara datos acerca de los mitos existentes sobre el mismo.. También encontrará estrategias para hacer la prueba de radón en su hogar y los pasos a seguir después de hacer la misma.

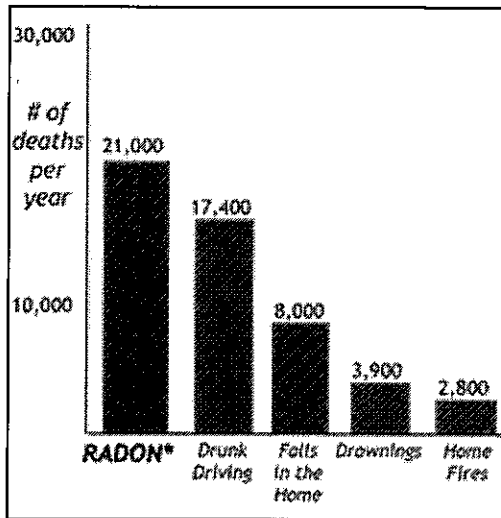
- [PDF Versión](#) (PDF, 16 pp, 1.47MB)

EPA Recommends:

- Test your home for radon -- it's easy and inexpensive.
- Fix your home if your radon level is 4 picoCuries per liter (pCi/L) or higher.
- Radon levels less than 4 pCi/L still pose a risk, and in many cases may be

reduced.

Radon is estimated to cause thousands of lung cancer deaths in the U.S. each year.



* Radon is estimated to cause about 21,000 lung cancer deaths per year, according to EPA's 2003 Assessment of Risks from Radon in Homes (EPA 402-R-03-003). The numbers of deaths from other causes are taken from the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Report and 2002 National Safety Council Reports.

Overview

Radon is a cancer-causing, radioactive gas.

You can't see radon. And you can't smell it or taste it. But it may be a problem in your home.

Radon is estimated to cause many thousands of deaths each year. That's because when you breathe air containing radon, you can get lung cancer. In fact, the Surgeon General has warned that radon is the second leading cause of lung cancer in the United States today. Only smoking causes more lung cancer deaths. **If you smoke and your home has high radon levels, your risk of lung cancer is especially high.**

Radon can be found all over the U.S.

Radon comes from the natural (radioactive) breakdown of uranium in soil, rock and water and gets into the air you breathe. Radon can be found all over the U.S. It can get into any type of building - homes, offices, and schools - and result in a high indoor radon level. But you and your family are most likely to get your greatest exposure at home, where you spend most of your time.

You should test for radon.

Testing is the only way to know if you and your family are at risk from radon. EPA and the Surgeon General recommend testing all homes below the third floor for radon. EPA also recommends testing in schools.

Testing is inexpensive and easy - it should only take a few minutes of your time. Millions of Americans have already tested their homes for radon (see [How to Test Your Home](#)).

You can fix a radon problem.

Radon reduction systems work and they are not too costly. Some radon reduction systems can reduce radon levels in your home by up to 99%. Even very high levels can be reduced to acceptable levels.

New homes can be built with radon-resistant features.

Radon-resistant construction techniques can be effective in preventing radon entry. When installed properly and completely, these simple and inexpensive techniques can help reduce indoor radon levels in homes. In addition, installing them at the time of construction makes it easier and less expensive to reduce radon levels further if these passive techniques don't reduce radon levels to below 4 pCi/L. **Every new home should be tested after occupancy, even if it was built radon-resistant.** If radon levels are still in excess of 4 pCi/L, the passive system should be activated by having a qualified mitigator install a vent fan. For more explanation of radon resistant construction techniques, refer to EPA publication, *Building Radon Out: A Step-by-Step Guide on How to Build Radon-Resistant Homes* (see EPA Publications).

How Does Radon Get Into Your Home?

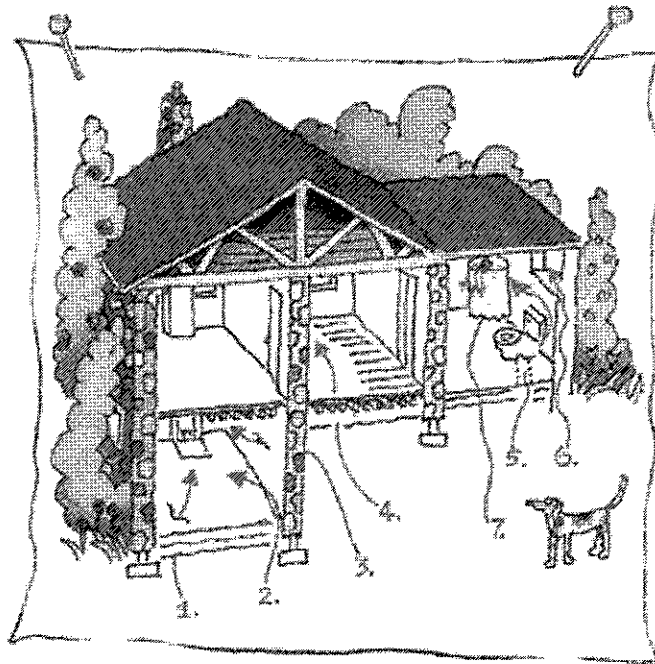
Radon is a radioactive gas. It comes from the natural decay of uranium that is found in nearly all soils. It typically moves up through the ground to the air above and into your home through cracks and other holes in the foundation. Your home traps radon inside, where it can build up. Any home may have a radon problem. This means new and old homes, well-sealed and drafty homes, and homes with or without basements.

Any home may have a radon problem

Radon from soil gas is the main cause of radon problems. Sometimes radon enters the home through well water (see "Radon in Water" below). In a small number of homes, the building materials can give off radon, too. However, building materials rarely cause radon problems by themselves.

RADON GETS IN THROUGH:

1. Cracks in solid floors
2. Construction joints
3. Cracks in walls
4. Gaps in suspended floors
5. Gaps around service pipes
6. Cavities inside walls
7. The water supply



Nearly 1 out of every 15 homes in the U.S. is estimated to have elevated radon levels. Elevated levels of radon gas have been found in homes in your state. Contact your state radon office for general information about radon in your area. While radon problems may be more common in some areas, any home may have a problem. The only way to know about your home is to test.

Radon can also be a problem in schools and workplaces. Ask your state radon office about radon problems in schools, daycare and childcare facilities, and workplaces in your area.

How to Test Your Home

You can't see radon, but it's not hard to find out if you have a radon problem in your home. All you need to do is test for radon. Testing is easy and should only take a few minutes of your time.

The amount of radon in the air is measured in "picoCuries per liter of air," or "pCi/L." Sometimes test results are expressed in Working Levels (WL) rather than picoCuries per liter (pCi/L) (4 pCi/L equals to 0.016 WL). There are many kinds of low-cost "do-it-yourself" radon test kits you can get through the mail and in hardware stores and other retail outlets. If you prefer, or if you are buying or selling a home, you can hire a qualified tester to do the testing for you. You should first contact your state radon office about obtaining a list of qualified testers. You can also contact a private radon proficiency program for lists of privately certified radon professionals serving your area. For links and information, visit www.epa.gov/radon/radontest.html .

There are Two General Ways to Test for Radon:**SHORT-TERM TESTING:**

The quickest way to test is with short-term tests. Short-term tests remain in your home for two days to 90 days, depending on the device. "Charcoal canisters," "alpha track," "electret ion chamber," "continuous monitors," and "charcoal liquid scintillation" detectors are most commonly used for short-term testing. Because radon levels tend to vary from day to day and season to season, a short-term test is less likely than a long-term test to tell you your year-round average radon level. If you need results quickly, however, a short-term test followed by a second short-term test may be used to decide whether to fix your home (see [Home Sales](#)).

How To Use a Test Kit:

Testing is easy and should only take a few minutes of your time.

Follow the instructions that come with your test kit. If you are doing a short-term test, close your windows and outside doors and keep them closed as much as possible during the test. Heating and air-conditioning system fans that re-circulate air may be operated. Do not operate fans or other machines which bring in air from outside. Fans that are part of a radon-reduction system or small exhaust fans operating only for short periods of time may run during the test. If you are doing a short-term test lasting just 2 or 3 days, be sure to close your windows and outside doors at least 12 hours **before** beginning the test, too. You should not conduct short-term tests lasting just 2 or 3 days during unusually severe storms or periods of unusually high winds. The test kit should be placed in the lowest lived-in level of the home (for example, the basement if it is frequently used, otherwise the first floor). It should be put in a room that is used regularly (like a living room, playroom, den or bedroom) but not your kitchen or bathroom. Place the kit at least 20 inches above the floor in a location where it won't be disturbed - away from drafts, high heat, high humidity, and exterior walls. Leave the kit in place for as long as the package says. Once you've finished the test, reseal the package and send it to the lab specified on the package right away for analysis. You should receive your test results within a few weeks.

LONG-TERM TESTING:

Long-term tests remain in your home for more than 90 days. "Alpha track" and "electret" detectors are commonly used for this type of testing. A long-term test will give you a reading that is more likely to tell you your home's year-round average radon level than a short-term test.

EPA Recommends the Following Testing Steps:

Step 1. Take a short-term test. If your result is 4 pCi/L or higher take a follow-up test (Step 2) to be sure.

Step 2. Follow up with either a long-term test or a second short-term test:

- For a better understanding of your year-round average radon level, take a long-term test.
- If you need results quickly, take a second short-term test.

The higher your initial short-term test result, the more certain you can be that you should take a short-term rather than a long-term follow up test. If your first short-term test result is more than twice EPA's 4 pCi/L action level,

you should take a second short-term test immediately.

Step 3. If you followed up with a long-term test: Fix your home if your long-term test result is 4 pCi/L or more. If you followed up with a second short-term test: The higher your short-term results, the more certain you can be that you should fix your home. Consider fixing your home if the average of your first and second test is 4 pCi/L or higher. (see also [Home Sales](#))



What Your Test Results Mean

The average indoor radon level is estimated to be about 1.3 pCi/L, and about 0.4 pCi/L of radon is normally found in the outside air. The U.S. Congress has set a long-term goal that indoor radon levels be no more than outdoor levels. While this goal is not yet technologically achievable in all cases, most homes today *can* be reduced to 2 pCi/L or below.

Test your home now and save your results. If you find high radon levels, fix your home before you decide to sell it.

Sometimes short-term tests are less definitive about whether or not your home is above 4 pCi/L. This can happen when your results are close to 4 pCi/L. For example, if the average of your two short-term test results is 4.1 pCi/L, there is about a 50% chance that your year-round average is somewhat below 4 pCi/L. However, EPA believes that any radon exposure carries some risk - no level of radon is safe. Even radon levels below 4 pCi/L pose some risk, and you can reduce your risk of lung cancer by lowering your radon level.

If your living patterns change and you begin occupying a lower level of your home (such as a basement) you should retest your home on that level.

Even if your test result is below 4 pCi/L, you may want to test again sometime in the future.

Radon and Home Sales

More and more, home buyers and renters are asking about radon levels before they buy or rent a home. Because real estate sales happen quickly, there is often little time to deal with radon and other issues. The best thing to do is to test for radon NOW and save the results in case the buyer is interested in them. Fix a problem if it exists so it won't

complicate your home sale. If you are planning to move, call your state radon office for EPA's pamphlet "Home Buyer's and Seller's Guide to Radon," which addresses some common questions. You can also use the results of two short-term tests done side-by-side (four inches apart) to decide whether to fix your home.

During home sales:

- Buyers often ask if a home has been tested, and if elevated levels were reduced.
- Buyers frequently want tests made by someone who is not involved in the home sale. Your state radon office can assist you in identifying a qualified tester.
- Buyers might want to know the radon levels in areas of the home (like a basement they plan to finish) that the seller might not otherwise test.

Today many homes are built to prevent radon from coming in. Your state or local area may require these radon-resistant construction features. If you are buying or renting a new home, ask the owner or builder if it has radon-resistant features. The EPA recommends building new homes with radon-resistant features in high radon potential (Zone 1) areas. Even if built radon-resistant, every new home should be tested for radon after occupancy. If you have a test result of 4 pCi/L or more, you can have a qualified mitigator easily add a vent fan to an existing passive system for about \$300 and further reduce the radon level in your home. For more information, refer to EPA's Map of Radon Zones and other useful EPA documents on radon-resistant new construction (see publications).

Radon in Water



There are two main sources for the radon in your home's indoor air, the soil and the water supply. Compared to radon entering the home through water, radon entering your home through the soil is usually a much larger risk.

If you've tested the air in your home and found a radon problem, and your water comes from a well, have your water tested.

The radon in your water supply poses an inhalation risk and an ingestion risk. Research has shown that your risk of lung cancer from breathing radon in air is much larger than your risk of stomach cancer from swallowing water with radon in it. Most of your risk from radon in water comes from radon released into the air when water is used for showering and other household purposes.

Radon in your home's water is not usually a problem when its source is surface water. A radon in water problem is more likely when its source is ground water, e.g. a private well or a public water supply system that uses ground water. If you are concerned that radon may be entering your home through the water and your water comes from a public water supply, contact your water supplier.

If you've tested your private well and have a radon in water problem, it can be fixed. Your home's water supply can be treated in two ways. Point-of-entry treatment can effectively remove radon from the water before it enters your home. Point-of-use treatment devices remove radon from your water at the tap, but only treat a small portion of the water you use and are not effective in reducing the risk from breathing

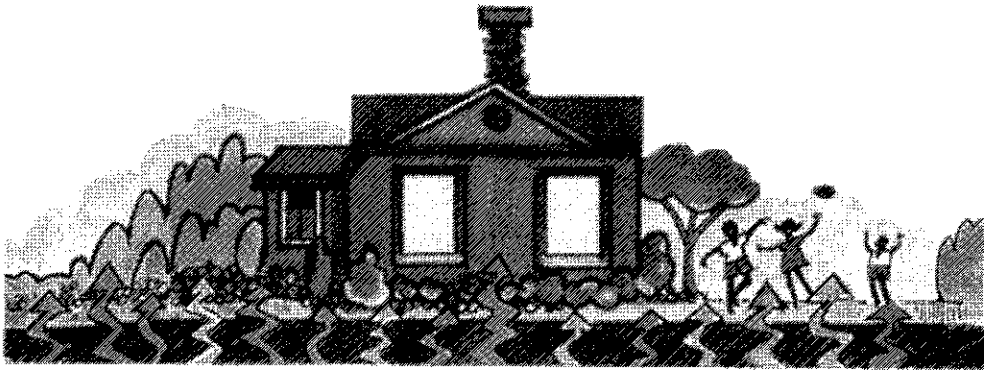
radon released into the air from all water used in the home.

For more information, call EPA's Drinking Water Hotline at (800) 426-4791 or visit www.epa.gov/safewater/radon.html If your water comes from a private well, you can also contact your state radon office.

How to Lower the Radon Levels in Your Home

Since there is no known safe level of radon, there can always be some risk. But the risk can be reduced by lowering the radon level in your home.

There are several proven methods to reduce radon in your home, but the one primarily used is a vent pipe system and fan, which pulls radon from beneath the house and vents it to the outside. This system, known as a soil suction radon reduction system, does not require major changes to your home. Sealing foundation cracks and other openings makes this kind of system more effective and cost-efficient. Similar systems can also be installed in houses with crawl spaces. Radon contractors can use other methods that may also work in your home. The right system depends on the design of your home and other factors.



Ways to reduce radon in your home are discussed in EPA's "Consumer's Guide to Radon Reduction." You can get a copy from your state radon office.

The cost of reducing radon in your home depends on how your home was built and the extent of the radon problem. Most homes can be fixed for about the same cost as other common home repairs. The average house costs about \$1,200 for a contractor to fix, although this can range from about \$800 to about \$2,500. The cost is much less if a passive system was installed during construction.

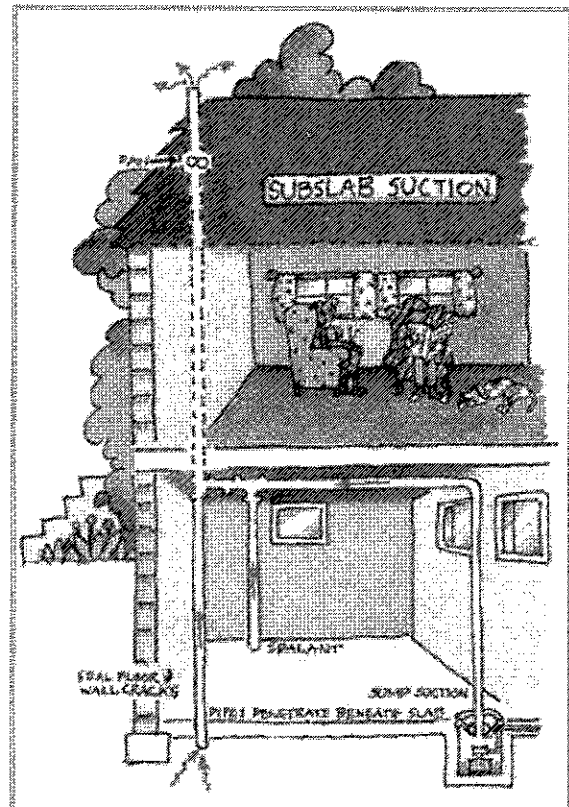
Radon and Home Renovations

If you are planning any major structural renovation, such as converting an unfinished basement area into living space, it is especially important to test the area for radon before you begin the renovation. If your test results indicate a radon problem, radon-resistant techniques can be inexpensively included as part of the renovation. Because major renovations can change the level of radon in any home, always test again after work is completed.

Lowering high radon levels requires technical knowledge and special skills. You should use a contractor who is trained to fix radon problems. A qualified contractor can study the radon problem in your home and help you pick the right treatment method.

Check with your state radon office for names of qualified or state certified radon contractors in your area. You can also contact private radon proficiency programs for lists of privately certified radon professionals in your area. For more information on private radon proficiency programs, visit www.epa.gov/radon/radontest.html Picking someone to fix your radon problem is much like choosing a contractor for other home repairs - you may want to get references and more than one estimate.

If you are considering fixing your home's radon problem yourself, you should first contact your state radon office for guidance and assistance.

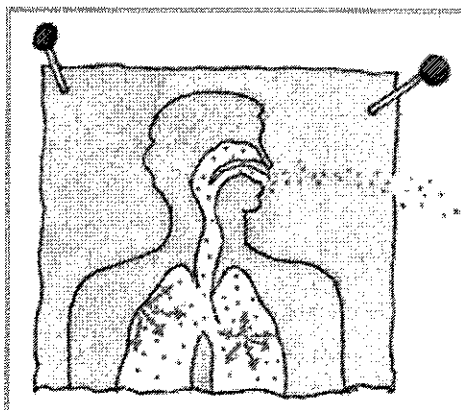


Most homes can be fixed for about the same cost as other common home repairs.

You should also test your home again after it is fixed to be sure that radon levels have been reduced. Most soil suction radon reduction systems include a monitor that will indicate whether the system is operating properly. In addition, it's a good idea to retest your home every two years to be sure radon levels remain low.

Note: The diagram is a composite view of several mitigation options. The typical mitigation system usually has only one pipe penetration through the basement floor; the pipe may also be installed on the outside of the house.

The Risk of Living With Radon



Radon gas decays into radioactive particles that can get trapped in your lungs when you breathe. As they break down further, these particles release small bursts of energy. This can damage lung tissue and lead to lung cancer over the course of your lifetime. Not everyone exposed to elevated levels of radon will develop lung cancer. And the amount of time between exposure and the onset of the disease may be many years.

Like other environmental pollutants, there is some uncertainty about the magnitude of radon health risks. However, we know more about radon risks than risks

from most other cancer-causing substances. This is because estimates of radon risks are based on studies of cancer in humans (underground miners).

Smoking combined with radon is an especially serious health risk. Stop smoking and lower your radon level to reduce your lung cancer risk.

Children have been reported to have greater risk than adults of certain types of cancer from radiation, but there are currently no conclusive data on whether children are at greater risk than adults from radon.

Scientists are more certain about radon risks than from most other cancer-causing substances.

Your chances of getting lung cancer from radon depend mostly on:

- **How much radon is in your home**
- **The amount of time you spend in your home**
- **Whether you are a smoker or have ever smoked**

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)	
<p>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.</p>			

It's never too late to reduce your risk of lung cancer. Don't wait to test and fix a radon problem. If you are a smoker, stop smoking.

Radon Myths

MYTH: Scientists are not sure that radon really is a problem.

FACT: *Although some scientists dispute the precise number of deaths due to radon, all the major health organizations (like the Centers for Disease Control and Prevention, the American Lung Association and the American Medical Association) agree with estimates that radon causes thousands of preventable lung cancer deaths every year. This is especially true among smokers, since the risk to smokers is much greater than to non-smokers.*

MYTH: Radon testing is difficult, time-consuming and expensive.

FACT: *Radon testing is easy. You can test your home yourself or hire a qualified radon test company. Either approach takes only a small amount of time and effort.*

MYTH: Radon testing devices are not reliable and are difficult to find.

FACT: *Reliable testing devices are available from qualified radon testers and companies. Reliable testing devices are also available by phone or mail-order, and can be purchased in hardware stores and other retail outlets. Call your state radon office for help in identifying radon testing companies.*

MYTH: Homes with radon problems can't be fixed.

FACT: *There are simple solutions to radon problems in homes. Hundreds of thousands of homeowners have already fixed radon problems in their homes. Radon levels can be readily lowered for \$800 to \$2,500 (with an average cost of \$1,200).. Call your state radon office for help in identifying qualified mitigation contractors.*

MYTH: Radon affects only certain kinds of homes.

FACT: *House construction can affect radon levels. However, radon can be a*

problem in homes of all types: old homes, new homes, drafty homes, insulated homes, homes with basements, and homes without basements. Local geology, construction materials, and how the home was built are among the factors that can affect radon levels in homes.

MYTH: Radon is only a problem in certain parts of the country.

***FACT:** High radon levels have been found in every state. Radon problems do vary from area to area, but the only way to know your radon level is to test.*

MYTH: A neighbor's test result is a good indication of whether your home has a problem.

***FACT:** It's not. Radon levels can vary greatly from home to home. The only way to know if your home has a radon problem is to test it.*

MYTH: Everyone should test their water for radon.

***FACT:** Although radon gets into some homes through water, it is important to first test the air in the home for radon. If your water comes from a public water supply that uses ground water, call your water supplier. If high radon levels are found and the home has a private well, call the Safe Drinking Water Hotline at 1 800-426-4791 for information on testing your water.*

MYTH: It's difficult to sell homes where radon problems have been discovered.

***FACT:** Where radon problems have been fixed, home sales have not been blocked or frustrated. The added protection is some times a good selling point.*

MYTH: I've lived in my home for so long, it doesn't make sense to take action now.

***FACT:** You will reduce your risk of lung cancer when you reduce radon levels, even if you've lived with a radon problem for a long time.*

MYTH: Short-term tests can't be used for making a decision about whether to fix your home.

***FACT:** A short-term test, followed by a second short-term test* can be used to decide whether to fix your home. However, the closer the average of your two short-term tests is to 4 pCi/L, the less certain you can be about whether your year-round average is above or below that level. Keep in mind that radon levels below 4 pCi/L still pose some risk. Radon levels can be reduced in most homes to 2 pCi/L or below.*

* If the radon test is part of a real estate transaction, the result of two short-term tests can be used in deciding whether to mitigate. For more information, see EPA's "[Home Buyer's and Seller's Guide to Radon](#)".

For Further Information

www.epa.gov/radon EPA's main radon page. Includes links to [publications](#), [hotlines](#), [private radon proficiency programs](#) and



more.

Hotlines

1-800-SOS-RADON (1-800-767-7236)

Operated by the National Safety Council in partnership with EPA to order radon test kits.

1-800-55RADON (1-800-557-2366)

Operated by the National Safety Council in partnership with EPA, for live help with radon questions.

1-800-844-6999

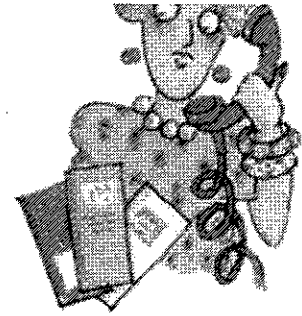
Radon Fix-It Hotline, operated by the National Safety Council in partnership with EPA for information on how to mitigate your home.

1-888-523-3187

Radon Hotline in Spanish, operators can be reached 9:00am to 5:00pm to assist with information about radon, or ordering a radon test kit.

1-800-426-4791

Safe Drinking Water Hotline, operated under contract to EPA. For information on testing, treatment, radon in water, and drinking water standards.



EPA Regional Offices

Check www.epa.gov/iag/whereyoulive.html for a listing of your EPA Regional office.

Publications

Radon publications in print can be downloaded at www.epa.gov/radon/pubs

You can order Indoor Air Quality publications from EPA's **National Service Center for Environmental Publications (NSCEP)**:

U.S. Environmental Protection Agency

National Service Center for Environmental Publications (NSCEP)

P.O. Box 42419

Cincinnati, OH 45242-0419

Website: www.epa.gov/nscep

Phone: 1-800-490-9198

Fax: (301) 604-3408

E-mail: nscep@bps-lmit.com

NSCEP operates a Toll-free phone service for EPA Publication Assistance with live customer service representative assistance Monday through Friday from 9:00am-5:30pm eastern time. Voice Mail is available after operating hours. You can fax or e-mail your publication requests. For technical assistance with NSCEP web pages, write to: nscep_nepis.tech@epa.gov

Please use the **EPA Document Number**, which is usually bolded or highlighted, when ordering from **NSCEP**.

How Do I Order Other EPA Publications? [Click Here](#)**SURGEON GENERAL HEALTH ADVISORY:**

"Indoor radon 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

U.S. EPA Assessment of Risks from Radon in Homes

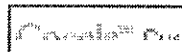
In June 2003, the EPA revised its risk assessment for radon exposure in homes. EPA estimates that about 21,000 annual lung cancer deaths are radon related. EPA also concluded that the effects of radon and cigarette smoking are synergistic, so that smokers are at higher risk from radon. EPA's revised estimates are based on the National Academy of Sciences 1999 BEIR IV (Biological Effects of Ionizing Radiation) Report which concluded that radon is the second leading cause of lung cancer after smoking. See www.epa.gov/radon/risk_assessment.html

State Radon Offices

Call your state office for additional help with any of your radon questions. Up-to-date information on how to contact your state radon office is available at www.epa.gov/iaq/wherelive.html (just click on your state or EPA regional office).

Tribal Radon Program Offices

See www.epa.gov/iaq/tribal.html



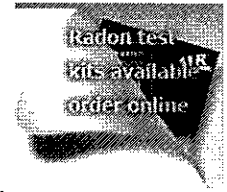
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National radon levels

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KITS RADON RESOURCES CONTACT INFO

HOME > Radon Facts > [RADON FACT SHEET](#)



Radon Fact Sheet

The U.S. Environmental Protection Agency (US EPA) and the [Surgeon General's Office](#) have estimated that as many as 20,000 lung cancer deaths are caused each year by radon. Radon is the second leading cause of lung cancer. Radon-induced lung cancer costs the United States over \$2 billion dollars per year in both direct and indirect health care costs. (Based on National Cancer Institute statistics of 14,400 annual radon lung cancer deaths - Oster, Colditz & Kelley, 1984)

According to the US EPA, nearly 1 in 3 homes checked in seven states and on three Indian lands had screening levels over 4 pCi/L, the EPA's recommended action level for radon exposure.

The alpha radiation emitted by radon is the same alpha radiation emitted by other alpha generating radiation sources such as plutonium.

A family whose home has radon levels of 4 pCi/l is exposed to approximately 35 times as much radiation as the Nuclear Regulatory Commission would allow if that family was standing next to the fence of a radioactive waste site. (25 mrem limit, 800 mrem exposure)

An elementary school student that spends 8 hours per day and 180 days per year in a classroom with 4 pCi/l of radon will receive nearly 10 times as much radiation as the Nuclear Regulatory Commission allows at the edge of a nuclear power plant. (25 mrem limit, 200 mrem exposure)

Most U.S. EPA lifetime safety standards for carcinogens are established based on a 1 in 100,000 risk of death. Most scientists agree that the risk of death for radon at 4 pCi/l is approximately 1 in 100. At the 4 pCi/l EPA action guideline level, radon carries approximately 1000 times the risk of death as any other EPA carcinogen. It is important to note that the action level is not a safe level, as there are no "safe" levels of radon gas.

What is radon?

A layman's description

Radon is a cancer-causing radioactive gas. You cannot see, smell or taste radon, but it may be a problem in your home. The Surgeon General has warned that radon is the second leading cause of lung cancer in the United States today. If you smoke and your home has high radon levels, you're at high risk for developing lung cancer. Some scientific studies of radon exposure indicate that children may be more sensitive to radon. This may be due to their higher respiration rate and their rapidly dividing cells, which may be more vulnerable to radiation damage.

A scientific description

PROPERTIES: Radon is a gaseous highly radioactive element discovered by English physicist Ernest Rutherford in 1899. The discovery is also credited to German physicist Friedrich Ernst Dorn in 1900. More specifically, Rutherford discovered radon's alpha radiation and Dorn discovered that radium was releasing a gas.

Radon is a colorless chemically-unreactive inert gas. The atomic radius is 1.34 angstroms and it is the heaviest known gas--radon is nine times denser than air. Because it is a single atom gas (unlike oxygen, O₂, which is comprised of two atoms) it easily penetrates many common materials like paper, leather, low density plastic (like plastic bags, etc.) most paints, and building materials like gypsum board (sheetrock), concrete block, mortar, sheathing paper (tarpaper), wood paneling, and most insulations.



Radon is also fairly soluble in water and organic solvents. Although reaction with other compounds is comparatively rare, it is not completely inert and forms stable molecules with highly electronegative materials. Radon is considered a noble gas that occurs in several isotopic forms. Only two are found in significant concentrations in the human environment: radon-222, and radon-220. Radon-222 is a member of the radioactive decay chain of uranium-238. Radon-220 is formed in the decay chain of thorium-232. Radon-222 decays in a sequence of radionuclides called radon decay products, radon daughters, or radon progeny. It is radon-222 that most readily occurs in the environment. Atmospheric releases of radon-222 results in the formation of decay products that are radioisotopes of heavy metals (polonium, lead, bismuth) and rapidly attach to other airborne materials such as dust and other materials facilitating inhalation.

USE: Radon has been used in some spas for presumed medical effects. In addition, radon is used to initiate and influence chemical reactions and as a surface label in the study of surface reactions. It has been obtained by pumping the gases off of a solution of a radium salt, sparking the gas mixture to combine the hydrogen and oxygen, removing the water and carbon dioxide by adsorption, and freezing out the radon.

PRODUCTION: Radon is not produced as a commercial product. Radon is a naturally occurring radioactive gas and comes from the natural breakdown (radioactive decay) of uranium. It is usually found in igneous rock and soil, but in some cases, well water may also be a source of radon.

EXPOSURE: The primary routes of potential human exposure to radon are inhalation and ingestion. Radon in the ground, groundwater, or building materials enters working and living spaces and disintegrates into its decay products. Although high concentrations of radon in groundwater may contribute to radon exposure through ingestion, the inhalation of radon released from water is usually more important.

RADON IN THE WORKPLACE In comparison with levels in outdoor air, humans in confined air spaces, particularly in underground work areas such as mines and buildings, are exposed to elevated concentrations of radon and its decay products. Exhalation of radon from ordinary rock and soils and from radon-rich water can cause significant radon concentrations in tunnels, power stations, caves, public baths, and spas. The average radon concentrations in houses are generally much lower than the average radon concentrations in underground ore mines.



Workers are exposed to radon in several occupations. In countries for which data were available, concentrations of radon decay products in underground mines are now typically less than 1000 Bq/m³ EEC Rn (approx. 28 pCi/l).

Underground uranium miners are exposed to the highest levels of radon and its decay products. Other underground workers and certain mineral processing workers may also be exposed to significant levels.

for radon gas

Should you test for radon?

Testing is the only way to know your home's radon levels. There are no immediate symptoms that will alert you to the presence of radon. It typically takes years of exposure before any problems surface.

The US EPA, Surgeon General, [American Lung Association](#), [American Medical Association](#), and [National Safety Council](#) recommend testing your home for radon because testing is the only way to know your home's radon levels. There are no immediate symptoms that will alert you to the presence of radon. It typically takes years of exposure before any problems surface.

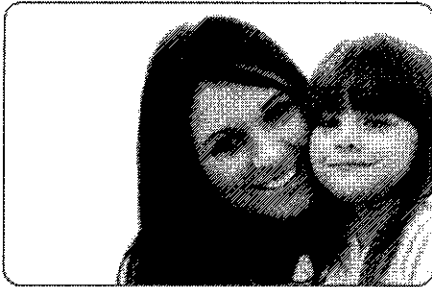
Radon is a national environmental health problem. Elevated radon levels have been discovered in every state. The US EPA estimates that as many as 8 million homes throughout the country have elevated levels of radon. Current [state surveys](#) show that 1 home in 5 has elevated radon levels.

Can you fix the problem?

If your home has high concentrations of radon there are ways to reduce it to acceptable levels. Most radon problems can be fixed by a do-it-yourselfer for less than \$500. If you want or require the assistance of a professional you may wish to look at the list of [certified radon mitigators](#) for your state.

800-AIR-CHEK (800-247-2435) · Hours: **8:30-5:30** Eastern Time, Monday - Friday

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Radon Quick Facts

- World's 2nd leading cause of lung cancer.
- Cause of 15% of lung cancer worldwide.
- Odorless and tasteless gas.
- Caused by the decay of soil and water.



- [Surgeon General National Health Advisory News Release](#)
- [US Environmental Protection Agency Information about Radon](#)

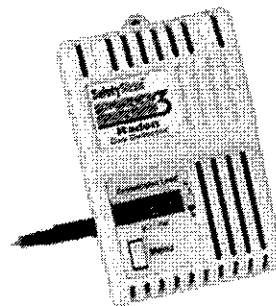
Pro Series 3 Certifications

EPA tested and evaluated, and meets EPA standards. EPA cannot certify this device because it is too unique to fit into any specific category.

Tested by Bowser-Morner – a multi-disciplined consulting engineering and analytical firm with the top radon testing laboratory in the country.

Safety Siren™ Pro Series 3 - Radon Gas Detector

Actual differences between the 2 & 3



Introducing the All New PRO SERIES 3 Radon Detector

EPA accepted for your added safety! This next generation radon detector monitors and reports unhealthy levels of Radon more efficiently and accurately than its predecessor the Pro Series II. The Pro Series 3 Radon Gas Detector is the only radon gas detector on the market designed for use by the homeowner. This detector allows the homeowner to monitor the radon levels in their home by displaying short-term and long-term averages.

Pro Series 3 - \$119.95 USD

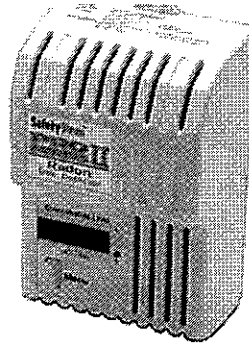
Available in 110v Only - Displays in PicoCuries



Pro Series 3 Features:

- **USA EPA EVALUATED AND ACCEPTED**
- Numeric LED radon gas level display range: .1 to 999.9 in pCi/L.
- Short and long term readings. Short-term readings: average radon levels over previous 7 days.
- Long-term readings: average radon levels since powered-up or last reset over maximum of 5 years.
- Audible alarm if short or long term averages are 4 pCi/L or greater.
- Continuous air sampling with hourly display update.
- Failsafe self test: every 24 hours. Failure generates an error code display.
- Menu button controls 4 functions.
- Switch between short-term and long-term displays: green LED illuminates next to S (short-term) or L (long-term). Manual Test of Detector Operation by User.
Mute or audible alarm reactivation button: use if radon detector is in alarm state. Clear and reset radon monitor memory to begin new test.
- Audible Alarm activates if:
Long term radon measurement reaches 4 pCi/L or greater. Short term radon measurement remains above 4 pCi/L for 30 consecutive days.
- 10 foot power cord for proper radon detector placement away from walls, windows and doors.
- One Year Limited Manufacturer's Warranty.

Safety Siren™ Pro Series 2 - Radon Gas Detector



Safety Siren™ Pro Series 2 - Radon Gas Detector

The Pro Series II Radon Gas Detector is the only radon gas detector on the market designed for use by the homeowner. This detector allows the homeowner to monitor the radon levels in their home by displaying short-term and long-term averages.

Pro Series 2 - \$109.95 USD

Available in 110v Only - Displays in PicoCuries



Pro Series 2 Features:

- Numeric LED display range of 0 to 999 shows the level of radon gas in pCi/L on a short-term or long-term basis.
- Short-term readings display the average radon levels over the past 7 days.
- Long-term readings display the average radon levels since powered-up or last reset with a maximum reading time of 5 years.
- Audible alarm sounds if the long-term average reaches 4 pCi/L or greater.
- Samples air continuously with the display updated every hour.
- A self-test is conducted every 24 hours with an error code displayed if there is a failure.
- Menu button controls 4 functions.
 1. Allows the user to switch between the short-term and long-term display, which is indicated by a green LED illuminated next to the S (short-term) or L (long-term).
 2. Allows the user to conduct a manual test of the detector.
 3. Allows the user to mute or reactivate the audible alarm if the detector is in an alarm state.
 4. Allows the user to clear and reset the memory of the detector to begin new readings.
- 10' power cord allows user to locate detector away from walls, windows and doors.
- One year warranty.



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News Release

FOR IMMEDIATE
RELEASE

Thursday, January 13,
2005

Contact: HHS Press
Office
(202) 690-6343

Surgeon General Releases National Health Advisory On Radon

U.S. Surgeon General Richard H. Carmona warned the American public about the risks of breathing indoor radon by issuing a national health advisory today. The advisory is meant to urge Americans to prevent this silent radioactive gas from seeping into their homes and building up to dangerous levels. Dr. Carmona issued the advisory during a two-day Surgeon General's Workshop on Healthy Indoor Environment.

"Indoor radon 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 county," Dr. Carmona said. "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."

Radon is an invisible, odorless and tasteless gas, with no immediate health symptoms, that comes from the breakdown of uranium inside the earth. Simple test kits can reveal the amount of radon in any building. Those with high levels can be fixed with simple and affordable venting techniques. According to U.S. Environmental Protection Agency (EPA) estimates, one in every 15 homes nationwide have a high radon level at or above the recommended radon action level of 4 pCi/L per liter of air.

National Health Advisory on Radon

Radon gas in the indoor air of America's homes poses a serious health risk. More than 20,000 Americans die of radon-related lung cancer every year. Millions of homes have an elevated radon level. If you also smoke, your risk of lung cancer is much higher. Test your home for radon every two years, and retest any time you move, make structural changes to your home, or occupy a previously unused level of a house. If you have a radon level of 4 pCi/L or more, take steps to remedy the problem as soon as possible.

"Americans need to know about the risks of indoor radon and have the information and tools they need to take action. That's why EPA is

Surgeon General News

- **May 29, 2008**
The Office of the Surgeon General Launches New Web Page "Healthy Youth for a Healthy Future" [Initi full story](#)
- **May 28, 2008**
Acting U.S. Surgeon General Promotes "Healthy Youth for a Healthy Future" in Indianapolis [full story](#)
- **May 20, 2008**
Acting U.S. Surgeon General Promotes "Healthy Youth for a Healthy Future" in California [full story](#)

Features

- [Childhood Overweight and Obesity Prevention Initiative-Healthy Youth for a Healthy Future](#)
- [Treating Tobacco Use and Dependence: 2008 Update](#)
- [Surgeon General's Conference on Preventing Preterm Birth, June 16-17, 2008](#)
[\[EXIT Disclaimer\]](#)
- [Proceedings of the Surgeon General's Workshop on Improving Health Literacy](#)
- [Deep Vein Thrombosis Workshop Proceedings](#)
- [Report of the Surgeon General's Workshop on Women's Mental Health](#)
- [The Surgeon General's Call to Action to Prevent and Reduce Underage Drinking](#)
- [U.S. Surgeon General's Family History Initiative](#)

Related Websites

- [Office of Public Health and Science](#)
- [U.S. Public Health Service Commissioned Corps](#)
- [Medical Reserve Corps](#)

actively promoting the Surgeon General's advice urging all Americans to get their homes tested for radon. If families do find elevated levels in their homes, they can take inexpensive steps that will reduce exposure to this risk," said Jeffrey R. Holmstead, Assistant Administrator, Office of Air and Radiation, U.S. Environmental Protection Agency (EPA).

"Based on national averages, we can expect that many of the homes owned or financed by federal government programs would have potentially elevated radon levels. The federal government has an opportunity to lead by example on this public health risk. We can accomplish this by using the outreach and awareness avenues we have, such as EPA's Web site, to share information and encourage action on radon to reduce risks," said Edwin Piñero, Federal Environmental Executive, Office of the Federal Environmental Executive (OFEE).

A national Public Service Announcement (PSA) that was released to television stations across America in January, National Radon Action Month, is reinforcing this recently updated health advisory. In the television spot, the camera scans a neighborhood with rooftop banners that remind the occupants of the importance to test their homes for radon. The television PSA can be viewed at:
<http://www.epa.gov/radon/rmpsa.html>.

For more information about radon go to EPA's Web site www.epa.gov/radon; or call your state radon office; or call a national toll-free hotline at 1-800-SOS-RADON (1-800-767-7236).

The Surgeon General's Workshop on Healthy Indoor Environment is bringing together the best scientific minds in the nation to discuss the continuing problem of unhealthy buildings. Indoor environments are structures including workplaces, schools, offices, houses and apartment buildings, and vehicles. According to a recent study, Americans spend between 85 and 95 percent of their time indoors.

In just the past 25 years, the percentage of health evaluations that the National Institute for Occupational Safety and Health at the Centers for Disease Control and Prevention (CDC) has conducted related to indoor-air quality has increased from 0.5 percent of all evaluations in 1978, to 52 percent of all evaluations since 1990. This means that in those years, the evaluations related to air quality concerns have increased from one of every 200 evaluations to one of every two.

The problem is also adversely affecting our children's health as millions of homes and apartments and one in five schools in America have indoor air quality problems. This can trigger various allergies and asthma. Asthma alone accounts for 14 million missed school days each year. The rate of asthma in young children has

risen by 160 percent in the past 15 years, and today one out of every 13 school-age children has asthma. Dr. Carmona is especially focusing on how unhealthy indoor environment affects children, as he promotes 2005 as The Year of the Healthy Child.

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Note: All HHS press releases, fact sheets and other press materials are available at <http://www.hhs.gov/news>.

Last revised: January 4, 2007

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Radon is a colorless, odorless, and tasteless radioactive gas and can be found at home, work, or your child's school - virtually anywhere in all 50 states! It can harm those most dear to you without any signs at all!


Unless you test for Radon now, there is no way of telling how much is present.

Order the Pro Series 3 Radon Detector Now!

Pro Series 3 - \$119.95 USD

Available in 110v Only - Displays in PicoCuries

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- [Surgeon General National Health Advisory News Release](#)
- [US Environmental Protection Agency Information about Radon](#)



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