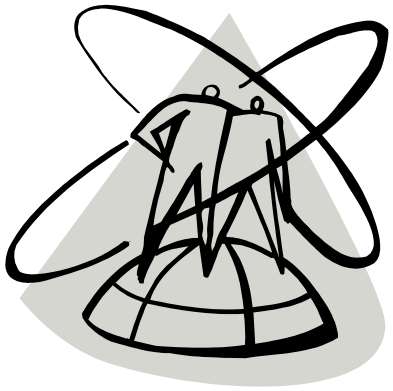
Radon, Real Estate and You

Student Manual



Section I: Radon

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Purpose:

The purpose of this training module is to familiarize you with radon and issues related to radon gas identified in homes that are tested during real estate transactions. Understanding the context of your clients' questions and acting as a resource during real estate sales is an essential role of realtors and brokers.

This training module is meant as an overview of radon, its health effects, measurement and mitigation techniques so that you are more comfortable with the topic, and in conveying basic information to your clients.

Learning Objectives

By the end of this training module, you will…

- Be able to identify three characteristics of radon gas
- Be able to visually recognize the location of the different radon potential zones in CT
- Be able to list the one major health risk associated with radon exposure
- Understand the number of fatalities associated with radon compared to other causes of fatality
- Be able to list two sources of radon that enter the home
- Be familiar with the most common types of testing devices used for radon in air
- Be able to interpret short-term radon testing results taken during a real estate transaction
- Recognize the value in utilizing qualified radon testing professionals
- Be able to list at least two different types of mitigation systems available
- Be able to recognize a radon mitigation system for air and/or water
- Have the necessary information to act as a radon resource for your clients

A. An Introduction to Radon

Radon is a colorless, odorless, and tasteless radioactive gas. That means, you can't detect it by smell, taste or sight. It is formed from the radioactive decay of radium and uranium, which is found naturally in rocks and soils throughout the world. All rocks and soils contain some amount of uranium or radium. If the source is strong enough, it can become a problem above ground in people's homes. When measuring radon in homes (rather than at a workplace), it is typically reported in units of radioactivity in both air and water as "picoCuries per liter" (pCi/L).

Radon is a naturally occurring radioactive gas.

Studies involving humans exposed to high levels of radon indicate that this gas causes lung cancer. The association between radon exposure and lung cancer is well-documented and studied. Because radon causes lung cancer, no exposure is actually considered acceptable and safe to humans.

The U.S. Environmental Protection Agency (EPA) has set an *action level* for radon in indoor air at 4.0 pCi/L. Radon levels in homes should be reduced if they are equal to or greater than the 4.0 pCi/L *action level*. The *action level* is a level at which EPA recommends actions be taken; it is not a regulatory standard. This action level is not a health-based standard. The action level was set at 4.0 pCi/L because it is known that radon mitigation systems can reduce radon gas to levels below 4.0 pCi/L. Not all mitigation systems, however, can reduce indoor radon levels to below 2.0 pCi/L.

The U.S. EPA has set an *action level of* 4 pCi/L for radon gas inside buildings.

Radon is commonly found at low levels in soil gases, but higher concentrations are possible near certain types of bedrock (granite, shale) that have high uranium content. This would suggest that radon potential in Connecticut could be predicted based upon the type of bedrock and soil in an area. However, radon test data indicate that high radon levels can (and do) occur in all parts of the state. There are factors other than the presence of rocks containing uranium that can affect a property's radon levels indoors. As a matter of fact, some of the higher radon levels in Connecticut have been found in regions where radon potential is considered to be lower. As such, it is important to remember that the only way to know if a home has a high radon level is to test!

The only way to know if a home has high radon levels is to have it tested!

In Summary:

- Radon is a naturally occurring radioactive gas
- Uranium is the source of radon
- Radon is found in all states in the U.S. and throughout the world
- Radon is colorless, odorless, and tasteless making it undetectable to human senses.
- The U.S. EPA action level for radon in the air is set at 4.0 picocuries per liter
- One out of fifteen homes in the U.S. has radon levels exceeding the EPA action level
- The only way to know if radon is present in a home is to test for it.

B. Radon Potential Map for Connecticut

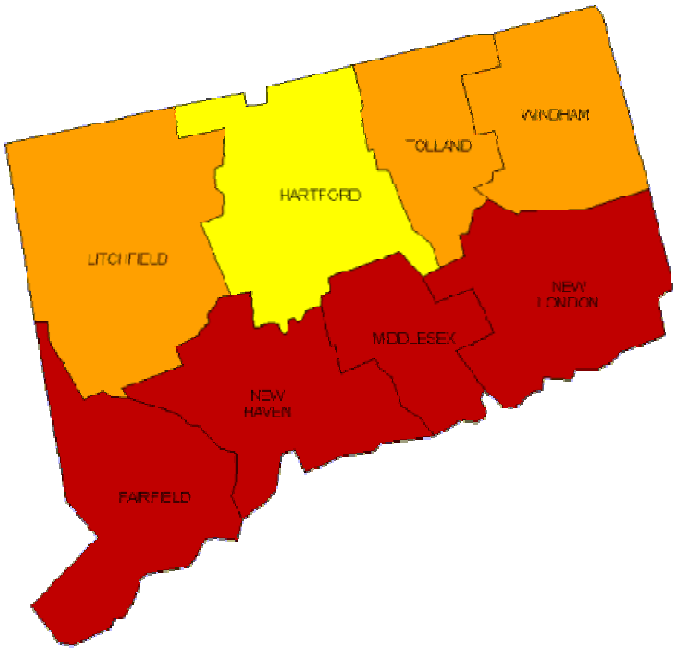
The U.S. EPA, and the U.S. Geological Survey have evaluated the radon potential across the country, and have developed maps to assist national, state, and local organizations to target their resources and to assist building code officials in deciding whether radon-resistant features are applicable in new construction. *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.

The map assigns each of the counties in Connecticut to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected to be measured in a building *without the implementation of radon control methods*. The radon zone designation of the highest priority is Zone 1.

Zone 1 High Potential (greater than 4 pCi/L)

Zone 2 Moderate Potential (from 2 to 4 pCi/L)

Zone 3 Low Potential (less than 2 pCi/L)



For more detailed information on the US EPA radon potential map please visit the following EPA website address:

http://www.epa.gov/radon/zonemap.html

In Summary:

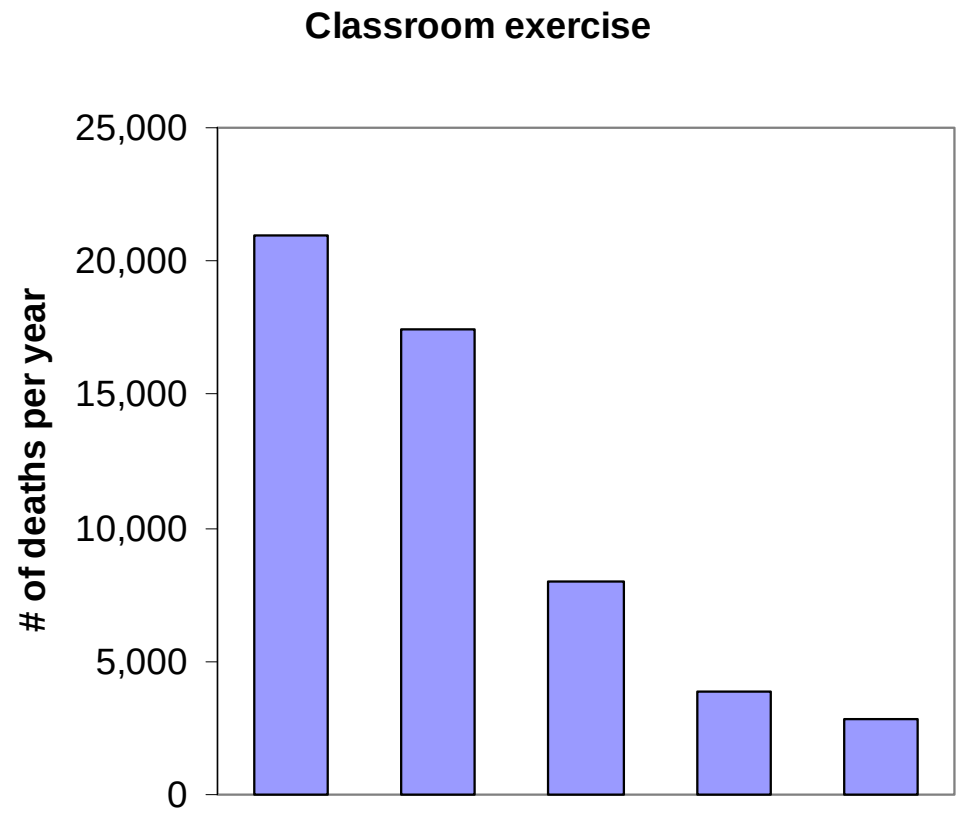
- The U.S EPA has developed a radon potential map to help state and local officials target their activities related to radon testing, mitigation, and the building of radon resistant new construction.
- The map does not provide Connecticut citizens with information radon levels in their homes. Testting is the only way to know!
- Homes in low potential areas have high radon levels, too.

C. In Class Exercise

Your instructor will break you all into groups of 5-7 people to discuss this exercise and your findings

Instructions:

- Write the letter (A-E) for the hazard on the chart below where you think it belongs. Discuss the group's decision as to where you place the piece of paper on the chart below, so that you are all in agreement.
- When you are finished, share your chart with other groups in the class.
- At the end of the exercise, the teacher will tell you the correct answer.
    - How close were you to getting the correct answers?
    - Were any of the actual numbers surprising to you?



Radon = A
Drunk driving deaths = B
Falls in the Home = C
Drownings = D
Homefires = E

D. Radon and Its Health Effects

The U.S. Surgeon General has warned all Americans to test their homes for radon, because at elevated levels, radon is the second leading cause of lung cancer in the United States following tobacco smoke. As such, radon is considered to be one of the *top environmental health risks in the U.S*. In 1999, the National Academy of Sciences (NAS) released estimates that between 15,000 and 22,000 lung cancer deaths each year in the United States are attributed to radon indoors. A person who has ever smoked and lives in a home with a radon level of 4.0 pCi/L or more has an especially high risk of developing lung cancer. The charts below explain the risk of developing lung cancer for smokers and non-smokers over a lifetime of exposure for different radon levels.

Radon is the second leading cause of lung cancer in the US behind cigarette smoking.

Radon Risk Chart

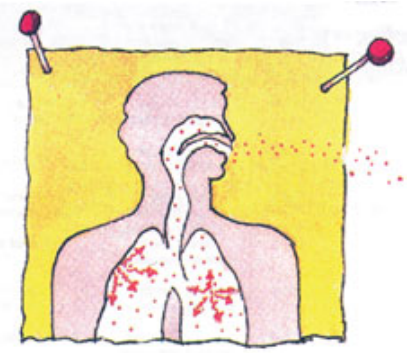
Radon Level	If 1,000 people who smoked were exposed to this level over a lifetime*...	If 1,000 people who never smoked were exposed to this level over a lifetime*...	WHAT TO DO: Stop smoking and...
20 pCi/L	About 260 people could get lung cancer	About 36 people could get lung cancer	Fix your home
10 pCi/L	About 150 people could get lung cancer	About 18 people could get lung cancer	Fix your home
8 pCi/L	About 120 people could get lung cancer	About 15 people could get lung cancer	Fix your home
4 pCi/L	About 62 people could get lung cancer	About 7 people could get lung cancer	Fix your home
2 pCi/L	About 32 people could get lung cancer	About 4 people could get lung cancer	Consider fixing between 2 and 4 pCi/L
1.3 pCi/L	About 20 people could get lung cancer	About 2 people could get lung cancer	(Reducing radon levels below 2 pCi/L is difficult.)
0.4 pCi/L	About 3 people could get lung cancer		

* 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.

US EPA (2004). A Citizen's Guide to Radon

Radon emits radiation as it breaks down. Radon and its decay products attach to airborne particles that are eventually breathed in by people living in a home. If the radon levels in the air are high enough, repeated exposure and inhalation of the dust particle greatly increases a person's risk for developing lung cancer. Scientists have established the link between radon in homes and the increased risk of lung cancer. This science is based upon a large number of studies worldwide**.**

Exposure to radon does not result in any immediate symptoms. The only known risk is associated with long-term exposure to high levels, which increases the risk of lung cancer. This cancer can take 20 to 30 years to develop. Because radon does not have an odor and does not produce immediate symptoms, people who have not tested their homes do not know if they have compromised their health. That is why it is so important to have homes tested for radon, and to help clients take action to reduce high levels if they are found. As a realtor, you are the person who is usually asked questions such as, "When should I test my home for radon?" or "Is it worth having the home tested for radon?" Giving new clients accurate information so that they can make an informed decision about testing for radon is an important role that you will play. The decision that your clients make can potentially impact their long term health status.



Graphic from US EPA (2004)
A Citizen's Guide to Radon

In Summary:

- Radon is the 2nd leading cause of lung cancer in the U.S
- The Surgeon General recommends all homes should be tested for radon
- Radon is a cancer-causing agent. No level of exposure is considered to be safe
- Smokers have a much greater risk of developing lung cancer when they are also exposed to radon.
- People inhale radon and radon decay products attached to airborne dust.
- Radon and its association with lung cancer is well-studies and established
- There are no short-term health effects associated with radon exposure
- -Radon-induced lung cancer takes a long time to develop

E. How Radon Enters The Home

Radon gas enters the home from two sources; through soils (as mentioned previously) or from the water. Radon entering a home through the soil is a much greater health risk compared to radon entering a home through water. Approximately one out of fifteen homes in the U.S. have radon levels above the EPA action level of 4.0 pCi/L. Radon gas is drawn into the home through cracks and other openings (e.g., sump pits) in the foundation. Air pressure inside the home is usually lower than the pressure in the soil around the foundation. This pressure difference creates a vacuum, and sucks radon gas into the home. This is especially true during the colder months of the year when the heating system is on and the home is closed-up. Radon levels, on average, are typically higher in the winter months.

Radon may also enter the home through water. Radon can be found in water in homes that are served by private wells. Radon gas is not usually found at high levels when it comes from a surface water source. The radon gas in water can be released to indoor air during tap water use, such as, showering, laundering clothes, and dishwashing. The transfer ratio for radon from well water to indoor air has been estimated as follows: 10,000 pCi/L in water may increase the level of radon in the air by 1.0 pCi/L. This means that concentrations greater than 40,000 pCi/L of radon in well water may substantially add to the indoor airborne radon level. The water to air ratio is only a rule of thumb. The amount of radon gas that comes from water sources in a home, actually depends on water usage patterns within the home.

Rule of thumb:
10,000 pCi/L of radon in water contributes about 1.0 pCi/L of radon into the air.

Drinking (ingesting) water that contains radon is not believed to be a significant health risk compared to inhaling radon in air. Thus, the concern with radon in tap water is that some of it can enter the air and be inhaled. Although radon in water may contribute to airborne radon levels, if radon levels in the air are not high, then occupants of the home are not being exposed to radon.

In Summary:

- Radon comes from two sources: radon in soils and radon in water
- Homes act like vacuums and draw radon indoors
- Radon gas can enter the home through many openings (cracks, and gaps in the basement floor)
- Well water (not surface water) can also act as a source of radon in a home when the home is served by well water
- 10,000 pCi/L of radon in water is equivalent to around 1.0 pCi/L of radon in the air. Water usage can change this ratio substantially.
- Radon that enters the home from soil gases is typically a more serious health risk than high levels of radon in the water.

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

F. Testing Radon in the Home

The Surgeon General and the U.S EPA recommend that *all homes should be tested for radon in indoor air*. A neighbor's level of radon gas is not a good indicator of whether or not the home that is being sold has a radon issue or not. Furthermore, the EPA recommends that homes be tested for radon in air prior to their being placed on the market. If you are working with clients who have not had their home tested, you should recommend that they consider testing early into the process to provide time to have the home mitigated in case elevated radon is detected.

A Word on Qualified Professionals

It is recommended that a qualified radon testing professional conduct the radon testing during a real estate transaction. Radon testing professionals have been trained in the proper use and placement of test devices. Furthermore, they must follow EPA protocols for testing, quality control and quality assurance.

When a qualified person conducts radon testing, that person will:

- Evaluate the home and recommend a testing approach designed to make sure you get reliable results;
- Explain how proper conditions can be maintained during the radon test;
- Emphasize to occupants of a home that a reliable test result depends on their cooperation. Interference with, or disturbance of, the test or closed-house conditions will invalidate the test result;
- Analyze the data and report measurement results; and
- Provide an independent test.

The CT DPH Radon Program maintains a list of nationally certified individuals who can conduct radon testing in homes throughout the state, and a list of home inspectors who have attended a one-day CT-developed course specific to radon measurement in residential properties. Nationally-certified individuals are certified by the National Radon Proficiency Program administered by the National Environmental Health Association and the National Radon Safety Board. The latest lists of radon testing professionals are included in the resources section of your student manual. For an updated list, please use the link below.

Lists of qualified individuals can found on the DPH Radon Program website at:
http://www.dph.state.ct.us/BRS/Radon/radon_program.htm

Overview of testing for radon in the air

There are two general testing procedures, for testing radon in the air.

1. A short-term test (lasting 2-90 days) and;
2. A long-term test (lasting 91 days-1 year).

Short-Term Testing

Typically, short-term testing is conducted during real estate transactions, because it provides a quick result for potential buyers to make an informed decision. Most short term testing lasts between 2- 7 days. In order to conduct short term radon tests, a home must remain closed. All doors and windows must remain shut, and all house fans, and indoor air systems that bring in outside air must also be turned off during radon testing. This is called "closed house conditions."

There are two options for short term testing:

1. simultaneous placement of two test devices to measure radon in the air; or
2. sequential placement of two test devices to measure radon in the air.

Test devices must be left in place for a minimum of 48 hours. The homeowner must maintain a closed-house condition for a minimum of 12 hours prior to placing the test kit. The location of the test for real estate transactions is to test in the lowest level suitable for occupancy without renovations. The potential buyer usually makes this determination. There are more than ten different methods approved for radon testing in homes. The following paragraphs are only meant to familiarize you with the more commonly used test methods and devices. Equipment used to test for radon in the air can be described as ***passive*** *or* ***active*** *devices*.

All radon testing must last a mimimum of 48 hours. All windows and doors must remain closed up for at least 12 hours prior to beginning testing, and during the testing period.

Commonly used passive devices for short-term testing:

Passive devices are test devices that are simply placed in the home, and the contents are analyzed in a laboratory. They do not have electrical or mechanical parts. Passive devices used for short term testing include charcoal canisters, charcoal liquid scintillation devices and electret ion chamber detectors.

The type of test kits that are typically used during real estate transactions are *charcoal test kits.* These test kits are usually supplied to a radon testing professional by a laboratory or manufacturer.

Activated charcoal test kits: diffusion barrier type

Electret Ion Chamber test device

The *Elecret Ion Chamber* is another type of passive test device that is frequently used to test for radon during real estate transactions. Electret ion chambers measure the average radon level in a home during the testing period.

Commonly used active devices for short term testing:

Active devices are mechanical devices that electronically and directly measure the radon levels in the air in a home. Typically, the type of device that is used during real estate transactions that is considered an active device is the *Continuous Radon Monitor*. When continuous radon monitors are used, only one test needs to be taken rather than two that are averaged. *Continuous Radon Monitors* must be deployed and operated by only qualified radon testing professionals. When used properly *Continuous Radon Monitors* offer the homeowner and potential buyer more information because they can be used to display hourly readings during the minimum 48 hour testing period.

Active radon measurement device with print-out

Long-Term Testing

Long-term testing is used to provide testing results that more accurately reflect year round airborne exposure to radon for occupants of a home. The EPA and CT DPH Radon Program strongly recommend that current homeowners conduct long-term testing to determine radon levels in the home. Long-term test results are more representative of the year-round average levels of radon in a home. Closed-house conditions do not need to be maintained for long-term testing. Prior to a home being placed on the market, a homeowner should consider beginning a long-term test.

Long-term testing is also recommended to follow-up on short-term test results that are between 4.0-10.0 pCi/L. Several types of radon devices are available for both short-term and long-term testing procedures. The results of testing should be compared to the EPA action level of 4.0 pCi/L.

The most frequently used devices that are used to conduct long-term radon testing are electret ion chambers, as described earlier, or another device called an *alpha-track detector*. Both of these devices are considered passive radon testing devices. They are placed in a home and left for at least 91 days to one year. Results are analyzed at the end of the testing period to determine the radon level in the home. If the level is at or above the action level the homeowner should consider reducing the radon level in the home.

Overview of Testing for Radon in Water

A qualified professional should be hired to collect water samples for radon analysis. Inconsistencies in radon levels in water are usually the result of improper collection of the sample. The CT DPH Environmental Laboratory Certification Program (ELCP) approves laboratories that analyze for radon in water. *Water samples submitted to laboratories that are not approved by the ELCP are not considered to be valid results*.

Therefore, it is important for you to refer your clients to qualified radon professionals for collecting water, and submitting the samples to a CT DPH approved laboratory for analysis. Environmental testing laboratories are regulated by the CT DPH. Results reported by laboratories that are not approved by the DPH to conduct radon testing in water are not considered *confirmatory* results. Decisions to mitigate radon in water should not be made based on results that are reported by a laboratory that is not approved the CT DPH.

If a home has been tested for radon in the air:

The CT DPH recommends testing a home's water for radon when the following two conditions are met:

1) the home is served by a private well; and
2) the indoor air radon level is equal to or greater than 4.0 pCi/L.

If a home has not been tested for radon in air:

Recommend that your client hire a professional to test for radon in both the air and water at the same time. Results for radon in both the air and water will be reported in a more timely manner, and the client can make an informed decision on whether or not radon needs to be reduced in the home, and where.

The water sampling technique is critical in obtaining accurate results and should only be performed by a qualified radon testing professional listed by the CT DPH Radon Program. Qualified individuals can be located on the Internet at the CT DPH Radon Program website: http://www.dph.state.ct.us/BRS/Radon/radon_program.htm.

In Summary:

- All homes should be tested for radon
- The federal government recommends radon testing be completed prior to placing a home on the market, and dealing with any problems beforehand
- There are several benefits to using a qualified radon professional to conduct testing:
    - More thorough evaluation of home and selection of most appropriate test location
    - Likely to generate more reliable results
    - Provide independent test results

- The two types of testing are short term (2-90 days) and long-term (91 days to one year).
- Short-term testing usually occurs during real estate transactions
- Closed-house conditions must be maintained at least 12 hours prior to testing
- Closed- house conditions must be maintained during short term testing
- All test kits must be placed for a minimum of 48 hours
- There are many test devices available on the market
- Long-term testing is more reliable and representative of the average year round levels of radon in a home
- Closed-house conditions do not need to be maintained for long-term testing
- Water should be tested for radon on properties served by private wells
- Reliability of testing results for radon in water is greatly influenced by two factors:
    1. Proper collection of the water sample
    2. Analysis of the radon sample by a DPH approved laboratory

- The Department of Public Health Radon Program website contains information on qualified radon testing professionals and approved laboratories for analyzing radon in water

G. Interpreting the Results

Radon in Air

Radon testing devices must be used properly for reliable results. A qualified radon testing professional will know whether or not testing conditions were acceptable, and if the results should be used. Weather events (rain, snow, high winds), and tampering can affect radon test results. Homeowners typically sign an agreement that they will not tamper with testing devices while they are in the home.

The chart below summarizes options for short-term testing during real estate transactions:

Short-Term Testing Options	What to do Next
Passive: Take two short-term tests at the same time in the same location for at least 48 hours. *or* *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.	Fix the home if the average of two tests is 4 pCi/L or more. Fix the home if the average of the two tests is 4 pCi/L or more.
Active: Test the home with a continuous monitor for at least 48 hours.	Fix the home if the average radon level is 4 pCi/L or more.

US EPA (2000). Homebuyer's and Seller's Guide to Radon.

* The results of the first test should not be reported prior to making the second measurement. This will help in preventing possible tampering.

EPA protocols for testing radon in the air when a home is not for sale are slightly different.

Radon in Water

The CT DPH has set a *guideline* of 5,000 pCi/L for radon in water. The homeowner should consider reducing radon levels from well water if the average of two or more *confirmatory* water tests are equal to or greater than 5,000 pCi/L.

In Summary:

- Radon testing devices must be used properly in order to provide reliable results
- Weather conditions during short-term testing can greatly impact the radon levels in a home
- The average of two radon results from passive testing devices should be used to determine whether or not a home should be mitigated
- One radon test result from an active device can be used to make a decision about whether or not to install a mitigation system in a home
- Radon testing and decision protocols are different for real estate transactions
- You should recommend mitigation when radon-in-air results are at or above 4.0 pCi/L
- You should recommend mitigation when radon-in-water test results are above 5,000 pCi/L when the collection and analysis of the water has been conducted by qualified individuals

H. Reducing radon in the home

Most importantly, when elevated levels of radon are found in the home, they can be reduced. To decrease airborne radon levels to below 4.0 pCi/L, a homeowner should hire a qualified radon professional. A *radon diagnostician* evaluates buildings found to have levels of radon gas that exceed the EPA action level of 4.0 pCi/L to determine the most effective location and type of system to install. A *radon mitigation contractor* takes steps including, but not limited to, installing ventilation systems, sealing entry routes for radon gas and installing sub-slab depressurization systems to reduce radon levels in homes.

The DPH compiles a list of qualified radon mitigation contractors who can evaluate affected properties and install radon reduction systems. These contractors have attended specialized courses, and successfully passed an examination provided by NEHA or NRSB-approved radon training providers.

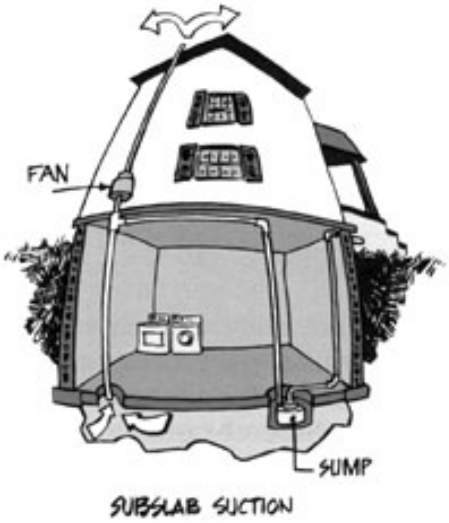
Contractors listed on the DPH website also maintain a Home Improvement Contractors license through the Department of Consumer Protection. By law, radon mitigation contractors must hold a Home Improvement Contractor license. A list of pre-screened radon mitigation contractors who are both trained and licensed by the Department of Consume Protection can be found on the Radon Program website under the "Radon Professionals" heading at:

http://www.dph.state.ct.us/BRS/Radon/radon_program.htm.

Reducing Radon in the Air

Radon reduction systems are usually fairly simple involving tubing and a fan that vents radon away from a home before it has a chance to enter the home. Radon reduction systems are typically called *radon mitigation systems*. The typical cost for a residential radon mitigation system is approximately $1200-$1800. The cost may be higher, and depends on the construction type and size (footprint) of the home.

There are several different types of radon mitigation system designs. **Active subslab suction** (also called **subslab depressurization**) is the most common and usually the most reliable radon reduction method. One or more suction pipes are inserted through the floor slab into the crushed rock or soil underneath. They also may be inserted below the concrete slab from outside the house. The number and location of suction pipes that are needed depends on how easily air can move in the crushed rock or soil under the slab, and on the strength of the radon source. Often, only a single suction point is needed.



Reducing Radon in Water

Two systems are currently available for decreasing radon levels in private wells. The whole house granular activated carbon (GAC) filter system can be used to treat radon in water at levels up to 10,000 pCi/L. Although GAC systems are less expensive to install ($1,000 to $1,500), the filter unit can become radioactive if it is not routinely replaced. The carbon filter must be changed each year to avoid radioactive waste disposal concerns and also to prevent a decrease in filter efficiency.

The alternative is an aeration system ($3,000 to $4,500). It is effective for all levels of radon in water, while not causing problems with radioactivity buildup or efficiency loss. This is because the radon is stripped from the water and vented outside the home. Aeration systems also need to be maintained, however.

Both of these types of radon reduction systems for water are under constant development and a number of variations of each system are on the market. Radon mitigation contractors listed by the CT Department of Public Health are trained to install radon reduction systems for drinking water.

A list of contractors compiled by the CT DPH Radon Program can be located at: http://www.dph.state.ct.us/BRS/Radon/radon_program.htm

In Summary:

- Elevated radon levels can be reduced in a home
- Qualified radon professionals are called “radon mitigation contractors”
- A list of radon mitigation contractors who are both nationally certified and licensed as ‘Home Improvement Contractors’ are listed by the DPH Radon Program
- The average cost of a radon mitigation system in Connecticut is $1200-$1800
- The most common mitigation system installation is through the basement floor; this is called ‘sub-slab depressurization’
- A mitigation system consists of PVC piping, a fan and an exhaust point
- A mitigation system is clearly labeled as such
- There are two types of water mitigation systems:
    1. Granular activated charcoal systems: effective at levels below 10,000 pCi/L
    2. Aeration systems: effective at reducing radon in water at all levels

I. Laws Pertaining to Radon

There are no laws requiring the testing and/or mitigation of radon in homes. The EPA and the DPH recommend and encourage the testing of all homes for radon and the mitigation of those with elevated levels. The same applies for real estate transactions. Mitigation during a real estate transaction is negotiated between the buyer and seller.

Department of Consumer Protection

The Uniform Property Condition Disclosure Act, Connecticut General Statutes Section 20-327b, requires the seller of residential property to provide this disclosure to the prospective purchaser prior to the prospective purchaser's execution of any binder, contract to purchase, option or lease containing a purchase option. These provisions apply to the transfer of residential real property of four *dwelling units or less* made with or without the assistance of a licensed broker or salesperson. The seller will be required to credit the purchaser with the sum of $300.00 at closing if the seller fails to furnish this report as required by this act. *The disclosure of radon testing, the results, and if a radon mitigation system has been installed are required on item # 34 on the form.*

The Connecticut Department of Consumer Protection (DCP) requires that all contractors that conduct radon mitigation work must register as Home Improvement Contractors. A contractor can be fined by the DCP for conducting radon mitigation work without a Home Improvement Contractors License.

Department of Public Health

The Department of Public Health is required, by statute, to maintain a list of radon professionals certified by the National Environmental Health Association and/or the National Radon Safety Board.

Although the Radon Program has no regulatory authority surrounding the actions of radon professionals, the program can report complaints regarding radon professionals to the national certifying agencies to have them de-listed, if necessary. Furthermore, the Department of Public Health can refer radon mitigation contractor complaints to the Department of Consumer Protection.

In closing, radon should be viewed as a health issue that has a simple and inexpensive solution.

For More Information, contact:

The CT Department of Public Health
Division of Environmental Health
Radon Program
450 Capitol Avenue, MS# 51AIR
Hartford, CT 06134-0308
860-509-7367

Websites:

Connecticut Department of Public Health
Radon Program
General information, lists of radon testers and contractors
http://www.dph.state.ct.us/BRS/Radon/radon_program.htm

U.S. EPA
http://www.epa.gov/iaq/radon
http://www.epa.gov/radon/pubs/index.html

References and additional reading sources:

Information in this training module was derived or adapted from the following sources. These and other documents available at http://www.epa.gov/radon/pubs/index.html are valuable sources of information.

U. S. Environmental Protection Agency (1993). *Protocols for radon and radon decay product measurements in homes*. EPA Document 402-R-93-003. Available at http://www.epa.gov/radon/pubs/homprot1.html

U.S. Environmental Protection Agency, U.S. Department of Health and Human Services & U.S. Public Health Service (2002). *A citizen's guide to radon: The guide to protecting yourself and your family from radon* (4th ed.). EPA Document 402-K02-006. Available at http://www.epa.gov/radon/pubs/citguide.html

U.S. Environmental Protection Agency (2000*). Home buyer's and seller's guide to radon*. EPA Document 402-K-00-008. Available at http://www.epa.gov/radon/pubs/hmbyguid.html

U.S. Environmental Protection Agency (2003). *Consumer's guide to radon reduction: How to fix your home*. EPA Document 402-K-03-002. Available at http://www.epa.gov/radon/pubs/consguid.html

U.S. Environmental Protection Agency (1994). *Model standards and techniques for control of radon in new residential buildings*. EPA Document 402-R-94-009. Available at http://www.epa.gov/radon/pubs/newconst.html

U.S. Environmental Protection Agency (1993). *A physician's guide—Radon: The health threat with a simple solution.* EPA Document 402-K-93-008. Available at http://www.epa.gov/radon/pubs/physic.html

U.S. Environmental Protection Agency (1994). *Radon mitigation standards*. EPA Document 402-R-93-078. Available at http://www.epa.gov/radon/pubs/mitstds.html

U.S. Environmental Protection Agency (2002). *Ground water and drinking water—Radon*. http://www.epa.gov/safewater/radon.html

U.S. Environmental Protection Agency, Eastern Environmental Radiation Facility (1999). *National Primary Drinking Water Regulations; Radon-222* [pp. 59295-59344] Federal Register Document Vol. 66. No. 211. Available at http://www.epa.gov/safewater/radon/radfr2.html

These documents and others are also available by request from the EPA.

You can write to: U.S. Environmental Protection Agency
National Center for Environmental Publications (NSCEP)
P.O. Box 42419
Cincinnati, OH 42419

Or, you can call: 1-800-490-9198
Or, you can fax a request to: (513) 489-8695