

Minnesota Department of Health

2010 State Indoor Radon Grant Report

Index

Radon Program Overview	2
Outreach	4
Radon Testing Data	5
Radon Resistant New Construction	6
Radon Mitigation	8
Schools	10
Medical Community	12
Community Programs	14
Addressing Disparities	15
Quarterly Meetings	16
Partner Spotlight	17
Summary	18
State Indoor Radon Grant Measures	20

Introduction:

In 2010 the Minnesota Department of Health's radon program has focused on creating high performing partnerships that increase the effectiveness of every public dollar. Through these partnerships we have been able to have influence far beyond our internal capabilities. For example, through these partners we have touched the medical community, strengthened the work done by our schools to protect the health of our children and started to address social justice. Our partners have shown us that there is still a great need for further work.

MDH hosted the 2010 regional Environmental Protection Agency (EPA) forum that was targeted at educating medical professionals on the health risks of radon and how to properly and effectively communicate these facts to their patients. The lung cancer survivors that gave their stories of how life was before and after they were diagnosed and the grim reality of a lung cancer diagnosis were powerful. Hearing cancer survivors say "I have never smoked in my lifetime, now I have lung cancer and there is a 15% chance I will live to celebrate five more birthdays" demanded the attention of everyone in the room.

Through the tireless work of school staff and the ability to clearly define the radon problems, schools in Minnesota were able to reduce radon levels in Minnesota schools. Through small changes in the operation of school buildings, instead of costly capital improvements schools have been able to protect the health of the students and staff without increasing the funding needs of the school district.

Through agency collaboration in low income supporting institutions radon levels in low income housing have been reduced and will continue to be reduced into the future. This work forms the foundation for other partnerships to come.

In 2009, a state law was implemented that required a partial passive radon reduction system to be installed in every newly constructed home. While this was a great step forward it may give new home buyers a false sense of security. In 2010, we launched our "Gold Standard" for new construction to encourage builders and new home buyers to have a full, active radon reduction system installed in every new home built in Minnesota. We are at a tipping point and with this small step forward, to the "Gold Standard", we hope to reverse the trend of more homes built with elevated radon levels every year than are currently being mitigated.

With all the great work that has been completed in 2010 MDH is looking forward to the challenges and success that lay ahead in 2011. As you read through this report, MDH is hopeful that you will find something that inspires you to take action to work with us to reduce radon levels in Minnesota.



Radon Program Overview

The **State Indoor Radon Grant (SIRG)** is a federal grant created under the 1988 Indoor Radon Abatement Act (IRAA) and administered by the Environmental Protection Agency (EPA). This grant distributes money to state and tribal agencies for the purpose of protecting the health of the public from the risks of radon related lung cancer. The IRAA set forth a listing of eligible radon related activities to be done in order to receive SIRG funding.

Eligible activities include:

- 1) Implementation of radon surveys
- 2) Development of public information and educational materials
- 3) Implementation of programs to control radon in existing and new structures
- 4) Purchase of radon measurement equipment or devices
- 5) Purchase and maintenance of analytical equipment
- 6) Payment of EPA approved training programs for state employees
- 7) Payment of general overhead and development
- 8) Development of data storage systems for radon information
- 9) Purchase of materials for mitigation demonstration projects

This document outlines the activities that the Minnesota Department of Health (MDH) Indoor Air Unit is currently undertaking in accordance with SIRG guidelines. It reports on outcomes and

progress in pursuing established programmatic goals.

These goals include:

- Sustaining and increasing the number of new homes built with active radon reduction systems
- Developing resources for homeowners who wish to install radon mitigation systems in their own home
 - Do-it-Yourself
 - Contractor Listing
 - Advanced Diagnostics
- Increasing the competence and capacity of radon testers and mitigators operating within the state
 - Hard to Mitigate Homes
 - Advanced Diagnostics Course
- Establishing and maintaining a collaborative network of organizations and stakeholders working to reduce the risk that radon poses to Minnesotans
 - Schools
 - Medical Community
 - Real Estate
 - Social Justice
- Continuing our efforts of community education and outreach
 - Quarterly Meetings
 - Home Shows

Lung Cancer in Perspective

According to the American Cancer Society, lung cancer accounts for approximately 28% of all cancer deaths each year and is the number one cause of cancer death in both men and women.

The five year survival rate for a person diagnosed with lung cancer is 15%.

An estimated 21,000 lung cancer diagnoses each year occur in persons who are non-smokers. Taken alone, non-smoking lung cancer is the 7th most diagnosed form of cancer.

Radon Level Annual Average	Lung Cancer Risk for people who Never Smoked	Lung Cancer Risk for people who Smoke
20 pCi/L	36 out of 1,000	260 out of 1,000
10 pCi/L	18 out of 1,000	150 out of 1,000
8 pCi/L	15 out of 1,000	120 out of 1,000
4 pCi/L	7 out of 1,000	62 out of 1,000
2 pCi/L	4 out of 1,000	32 out of 1,000

Picocuries per liter (pCi/L) which is a unit that measures levels of radon/radioactive gas.

Radon Overview

Radon gas is the result of the natural decay of uranium that is found in nearly all soils. The geology of Minnesota is especially high in Uranium. Uranium breaks down into radium, which in turn breaks down into radon gas. As a gas, radon moves up through the soil and into the air.

Radon is present almost everywhere and there is no known, safe level of exposure. The greatest potential for exposure is found indoors- generally in the lowest levels of homes. Regardless of the age of a home, what it is made of, how well-sealed it is, or whether it has a basement; radon can still be a problem. In Minnesota, one in three homes has radon levels that pose a significant health risk to occupants.

Two components that affect how much radon will accumulate in a home are pathways and air pressure. These components will differ from home to home. For this reason it is nearly impossible to determine if a home will have high levels of radon based solely on levels in nearby homes.

MDH recommends that all Minnesota homeowners test their homes for radon. A radon test is the only way to find out how much radon is in your home and if you and your family are at risk. Performing a radon test on your own is easy, inexpensive and takes only a few minutes of your time. The results of a properly performed radon test will help you determine if you need to take further action to protect yourself from the health risks of radon.



pathways

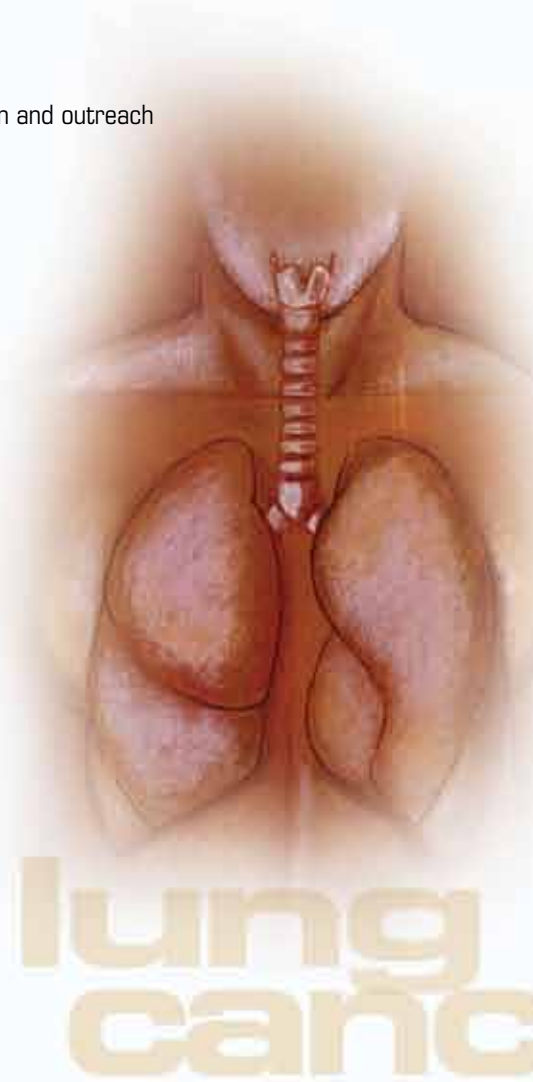
are routes the gas uses to enter your home and are found anywhere there is an opening between the home and the soil.

air pressure

between your home's interior and the exterior soil is what helps to draw radon gas into the home via the pathways.



- A** Cracks in concrete slabs
- B** Spaces behind brick veneer walls that rest on uncapped hollow-block foundations
- C** Pores and cracks in concrete blocks
- D** Floor-wall joints
- E** Exposed soil, as in a sump or crawl space
- F** Weeping (drain) tile, if drained to an open sump
- G** Mortar joints
- H** Loose fitting pipe penetrations
- I** Open tops of block walls
- J** Building materials: brick, concrete, rock
- K** Well water (not commonly a major source in Minnesota homes)





Outreach



Photo Courtesy of: MDH Radon Program

Home Shows

Home shows are one of the main ways that MDH educates the citizens of Minnesota about the risks of exposure to radon gas. The home shows give us the chance to interact with the public to better understand their needs and wants for education and assistance. We interact with thousands of people over the course of a few days; in 2010 we distributed over 1500 radon education brochures at our main home shows.

2010 Home Shows

- Home & Patio Show - St. Paul River Centre
- Energy Expo - Duluth
- Home and Garden Show - Minneapolis Convention Center
- Southern Home Builders Show - Mankato
- Living Green Expo - State Fair Grounds
- Greening the Heartland - Minneapolis Convention Center
- Breath of Hope Lung Run/Walk - Lake Harriet
- National Association of Home Rehabilitation Officials - Duluth

The focus of MDH's efforts in the past year have been, and will continue to be, ensuring that newly built homes or homes involved in real-estate transactions will have levels of radon that are as low as possible. A large part of this effort involves educating homeowners through a collaborative network of different groups. These groups include:

- Local Public Health (LPH) agencies that provide leadership and actively work to address the radon problem within their communities.
- State and local Housing Rehabilitation Associations (HRA), which provide radon testing and mitigation during home rehabilitation.
- Medical professionals within hospitals and clinics who can provide patients with radon education materials and free or low-cost test kits.
- The radon mitigation industry, which includes radon testers and mitigators who provide radon related services to homeowners.
- State and local media groups that can effectively spread the message about the importance of radon testing and mitigation.
- Individual Minnesota residents whose lives have been affected by radon related lung cancer.
- Nonprofit organizations such as the American Cancer Society, the American Lung Association, Cancer Survivors Against Radon, and A Breath of Hope Lung Foundation. These groups provide vital links to the community and an active voice in the fight against radon exposure and lung cancer.



Radon Testing Results Database

We keep a database of radon testing conducted in Minnesota to increase the effectiveness of our program and to graphically show the indoor radon concentrations in a given geographic area. The radon testing data that we have is summarized on the zip code and county level.

Quality Assurance and Quality Control

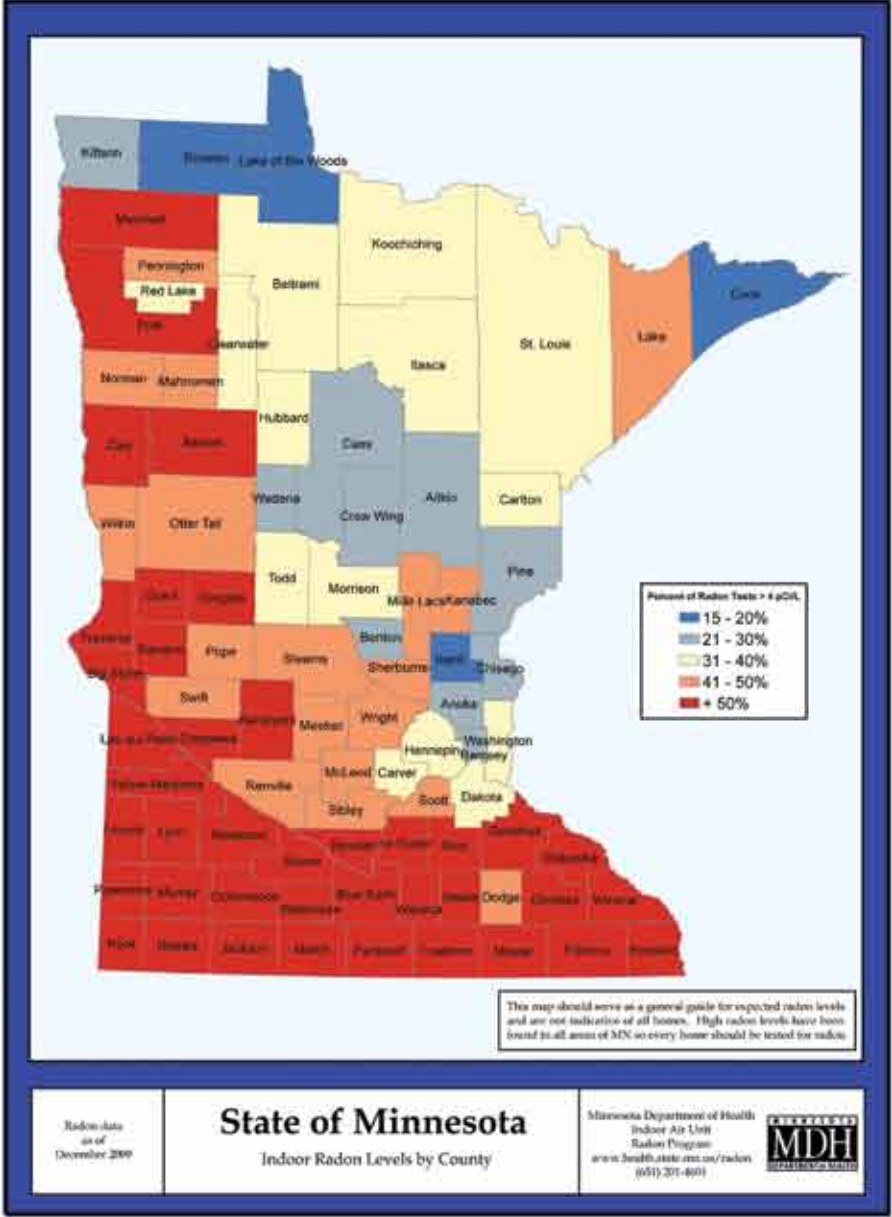
Quality Assurance and Quality Control (QA/QC) is a very important piece of radon testing; it ensures that the radon test results being reported by the radon laboratories are accurate. MDH distributes over 3000 test kits per year through our partners. With this volume of kits it is important that MDH does Quality Control on the laboratories that are analyzing the test kits that we distribute. Our Quality Assurance plan has three pieces to ensure a quality measurement is reported: blanks, duplicates and spikes; each of these things test for a different component of quality.

Blanks are test kits that are taken out of each box that we send out to ensure that nothing has tainted the kits in storage. This is important for short term test kits because the kits that we distribute use charcoal to adsorb the air around the test kit when opened. If these kits are tainted by moisture or radon while in storage, they will not be able to adsorb the correct amount of radon when they are deployed because some of the charcoal will already be full and not able to adsorb any additional radon when opened.

Duplicates assess the precision of the radon test kits. This is important to know if two kits are adsorbing radon in the same amounts when exposed to the same exposure conditions. This tells us that if we use two kits at different times or places that we can compare or average the results and they will not be biased.

Spikes are the last Quality Control measure that we use; spikes assess how accurate the test kits are. We do this by sending multiple groups of radon kits to a radon chamber which can accurately expose our radon test kits to a given level of radon and moisture. These kits are then sent to the radon lab for analysis and we can then compare the known level of radon in the chamber to the measured level by the radon laboratory. This is very important because we expect that everyone to whom we distribute kits to make a decision on whether to mitigate based on the test results of their kit. If the kits were not accurate, we could have citizens exposed to levels that greatly increase the likelihood of getting lung cancer when they thought that they did not have high levels of radon or spending money to mitigate a problem that does not exist.

Radon Testing Data



Using MN Radon Data

Our data is used by schools and other companies to communicate the radon risk or prevalence in their area. Schools use the summarized data to communicate the radon risk to the parents of their students. Our data is also included in some hospital patient tracking software so that a doctor can relay the radon risk to patients in their area.



Radon Resistant New Construction

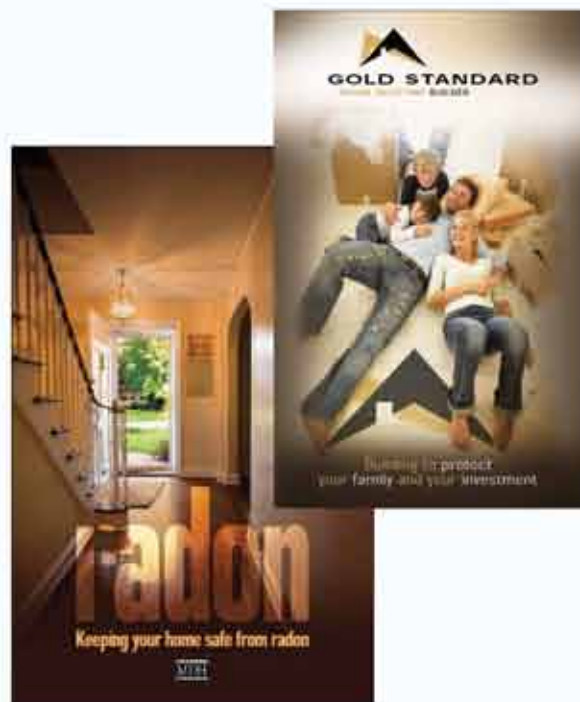
New Construction is an important focus of the radon community. New construction is the best opportunity to reduce indoor radon levels to the lowest extent possible. This is due to the fact the builder has control over every aspect of the design and construction of the home. In the past few years there has been a lot of work in this area. As of June 1, 2009 all new homes built in Minnesota are required to have the basic components of a radon system installed.

These **code required** systems **do not** ensure that the radon levels are reduced. The good news is that there is a very minimal cost difference between the code required system and a system that will achieve the maximum radon reduction possible. The Minnesota Department of Health has created a brand, the **Gold Standard** for Radon Resistant New Construction, to promote builders in Minnesota that are interested in protecting the health of their clients by installing radon systems that ensure the **maximum risk reduction** for the homeowners. The difference between the Gold Standard and the code is that the code requires a passive system while the Gold Standard requires an active system.

In the last year there has been work to create model code language for the Gold Standard; this effort will result in an American National Standard Institute (ANSI) standard in early 2011. This is a major step forward in new construction because it will be code language that will require an active system and could potentially replace the current passive standard in the International Residential Code.

Even with these major steps forward in the past few years Minnesota builders are still building more houses with elevated radon levels than are mitigated each year. In the past year there have been about 7,100 new homes built, with an estimated 1/3 of those homes having elevated radon levels. This means that Minnesota's housing stock has **2,366 more homes** that have elevated indoor radon levels. Radon mitigation contractors mitigated approximately 1,152 homes leaving 1,214 more houses in Minnesota with elevated radon levels than in 2009. This additional number of homes is much lower this year than in the past, even though the number of homes mitigated each year has not changed dramatically. Since the economic decline in 2008, the new home construction industry has decreased the number of homes built each year from about 15,000 to 7,000. Before the drop in new construction, Minnesota was adding around 4,000 new homes with elevated radon levels to the housing stock each year.

Increasing the number of new homes built to the Gold Standard will be the top priority for the radon program in the coming year. **If we cannot stop adding more houses to the housing stock with elevated radon levels we will not be able to decrease the number of radon related lung cancer deaths that occur in Minnesota.**



Passive Radon Mitigation

International Residential Code (IRC) Appendix F building requirements require a passive system to be installed in all newly built homes. This was adopted in the MN building code in 2009. Research has shown that the best passive radon systems result in, at best, a 50% reduction to indoor radon concentrations and any system that is able to achieve that much reduction is generally built to even stricter specifications than those prescribed by the current IRC Appendix F.



Health House Partnership

The American Lung Association now includes the Gold Standard as part of their Health House™ building guidelines. This partnership will take the Minnesota Department of Health Gold Standard for Radon Resistant New Construction to the rest of the Midwest region.

The American Lung Association of the Upper Midwest (ALAUM) is actively working to improve indoor air quality and lung health through its acclaimed Health House™ program. Developed in 1992 in response to growing concerns about the quality of indoor air, Health House™ continues to strive to improve the way homes are built and cared for, making them healthier for all inhabitants, but especially those suffering from asthma and other respiratory diseases.

Health House™ addresses the American Lung Association mission to prevent lung disease and promote lung health by combining sound medical science and first-class building science and by providing credible information and education to homeowners and industry professionals regarding home design, renovation, and operation, with a focus on indoor air quality (IAQ), energy efficiency, and durability.

The American Lung Association of the Upper Midwest Health House™ Builder Guidelines are the cornerstone of the Health House™ program. They are among the most stringent standards in the construction industry and set significantly higher standards than local building codes. The Builder Guidelines provide standards pertaining to site selection, foundation design, framing techniques, HVAC systems, and interior finishes and furnishings. A home built according to the requirements provided by the Health House™ Builder Guidelines will have improved air quality, better energy efficiency, and more environmentally friendly features than an average home.

Gold Standard

The MDH Gold Standard requires installed passive radon systems to be activated by installing an in-line fan. This activation will offer the maximum indoor radon reduction. Installation of an active radon mitigation system has a very minimal cost increase over the requirements of the IRC Appendix F, averaging around \$100, which is very low for the amount of "value" added to the house. Currently, there is an ANSI standard addressing radon resistant new construction, which includes the Gold Standard requirements, under public comment. The main goal for the ANSI standard is to include it in the next revision of the IRC language.

Radon Mitigation

Radon Contractor Certification

Minnesota does not require radon mitigation contractors to obtain certification or license. Although it is not required, a voluntary certification does indicate that the individual has received radon mitigation training and has taken continuing radon education. Both the National Environmental Health Association (NEHA) and the National Radon Safety Board (NRSB) have voluntary certification programs for radon mitigation contractors. For more information regarding the requirements of these certifications, information regarding a specific listed contractor, or an updated list of certified professionals, please contact NEHA or NRSB directly.

Contractor Listing

MDH has a list of radon contractors that it partners with at:

www.health.state.mn.us/radon

The requirements to be MDH listed are:

- Completing a registration form
- Reporting mitigation results quarterly. These reports allow MDH to better determine the amount of risk reduction achieved by tracking the number of mitigations being performed throughout the state.
- Certification with NEHA and/or NRSB
- Attending a minimum of two of the four MDH quarterly stakeholder meetings

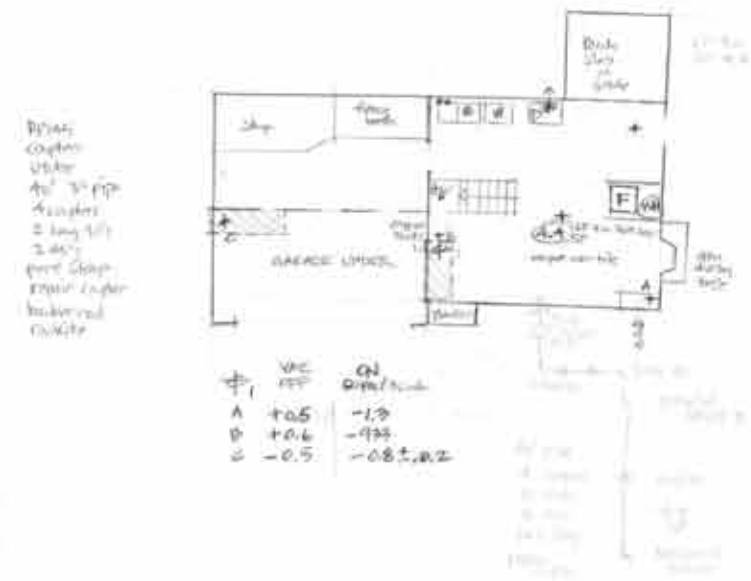
This partnership is essential for the radon program because it allows us to get numbers on the amount of mitigation that is happening in Minnesota. It also gives us the opportunity to educate the listed radon contractors on the latest tools or techniques for mitigation which makes them more knowledgeable so that they can install better systems for the citizens of Minnesota.

City Requirements

As the radon industry grows in size, it increasingly comes to the attention of the city building departments. Currently, radon mitigation is not defined in our state building code which makes it difficult to interpret which code requirements actually apply to mitigation. Cities have been starting to create their own requirements for radon mitigation. The only statewide codes that apply to mitigation systems are the electrical code and the fire code.

Advanced Diagnostics Designation

Advanced diagnostics are provided by contractors that have proven proficiency in advanced diagnostics or have completed the Midwest Universities Radon Consortium (MURC) advanced diagnostics course. This check box is the most valuable tool of the MDH radon contractor listing because it has a verification requirement that they have the necessary tools to be a good contractor and they have demonstrated to MDH that they have the knowledge to use these tools appropriately.



DIY Radon Mitigation

One of the main reasons, cited by homeowners, for not installing a radon mitigation system has been cost. This factor combined with the number of people that like to do the work themselves, creates a need for resources and education to assist homeowners in reducing their radon risk. MDH will be creating a list of contractors and resources that will help homeowners reduce their risk of radon related lung cancer themselves.

Changes to the American Society for Testing and Materials E2121

- Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings (ASTM E2121)

A number of changes to ASTM E2121 will require contractors to document their work and increase the amount of diagnostics and paperwork that must be completed with each system. The changes will require that an "operations manual" and an "as built" plan be left with each system so that the homeowner and future homeowners know how the radon system works, where the radon systems is, the components of the radon system and how to maintain all portions of the radon mitigation system that need continued maintenance.



Hard to Mitigate Houses

As a service to all MDH listed contractors, MDH will do technical site visits to assist the radon contractor in the design and installation of radon mitigation systems to ensure that an MDH listed contractor is always successful.

This has become an increasingly important aspect of the radon program. In the past few years there have been homeowners who were interested in mitigating their homes but there were very few, if any, contractors who were willing to try to fix the more difficult houses because they were not confident in recommending a solution. The radon program has worked with contractors through training and on-site consultation to increase their willingness to fix these houses. More and more contractors are taking on harder houses, in part from the increased confidence that the MDH radon program will be able to help them if needed.

These "hard to mitigate" homes are a chance to keep in touch with our listed contractors and to know what the industry needs for education and support. MDH gets requests monthly to assist contractors to ensure that they are not leaving any house with high indoor levels of radon.

Next year we will be increasing our communication with our listed contractors to get examples of projects they have completed, what unique solutions or construction techniques they have found and ideas for future support. MDH will take this feedback and issue a monthly newsletter that will summarize everything so that the listed contractors can learn from each other.



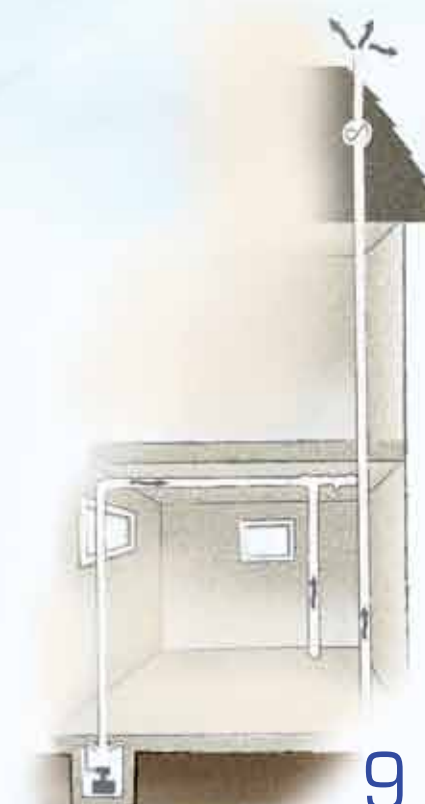
Common Housing Features Needing Technical Support:

- Transite Ductwork
- Karst Geology
- Retrofitted basement waterproofing
- Crawlspace optimization
- Partial drantile systems
- Holes under furnaces
- Large basement footprints
- Basement edging "vent mat"
- In floor radiant heat
- Large amount of ground capping next to house



MDH has also been working with MURC staff at the University of Minnesota to develop an advanced diagnostics course that will better equip radon contractors in Minnesota to better understand the houses that they are working on, increase the effectiveness of their radon reduction systems and to reduce the operating costs of reducing radon levels. This class is currently in its pilot phase and should be ready for all contractors in 2011.

This course was developed in cooperation with the U.S. EPA to advance the technical diagnostic and design skills of radon mitigation professionals in order to install profitable and high value optimal mitigation systems. Topics covered in this course were developed in collaboration with leading radon mitigation contractors from the various regions of the U.S. and include discussion and hands-on exercises involving: sub slab communication testing before, during, and after mitigation; determining system resistances and necessary fan and piping to obtain necessary Pressure Field Extension (PFE); determining multi-branch systems specifications; advanced radon measurement diagnostic techniques; addressing problem houses such as those with basement groundwater control systems and high airflow from Karst; and designing and installing ERV/HRV systems.





Minnesota Cancer Control Plan

Soon after the Prescription for Radon: A Medical Forum event (see sidebar), the Indoor Air Unit was contacted by the MDH Cancer Control Section. The Cancer Control Section helps to oversee the Minnesota Cancer Alliance, a coalition of health organizations, community groups, and volunteers that create and implement five-year plans designed to reduce the cancer burden among all Minnesotans.

The 2011-2016 five-year cancer plan is currently being developed by the group and is comprised of sixteen different objectives to address the issue of cancer within the state. The Indoor Air Unit was asked to help develop an objective related to reducing the radon related lung-cancer risk to Minnesotans. Inclusion in the Minnesota Cancer Plan is a big success for the radon program as it connects it to a larger community of organizations that have competencies that are complementary. For example, these organizations are able to advocate, educate, and engage stakeholder groups in ways that are beyond the capability or scope of the radon program.

The objective for radon is to "establish statewide policies that will result in levels of radon in new and existing homes that are as low as reasonably achievable." Strategies for reaching this objective include: incorporation of the MDH Gold Standard into current Radon Resistant New Construction requirements, advocating for statewide policies requiring radon education and/or testing during real-estate transactions, and educating stakeholders including legislators, real-estate agents, and associated nonprofit agencies regarding radon safety.

The above activities will be performed by Minnesota Cancer Alliance member organizations, of which there are about 100. The Alliance has identified this objective, along with several other policy-related objectives, as a priority and will be hiring a policy coordinator to oversee advocacy activities. The MDH Indoor Air Unit will be responsible for educating stakeholders and providing supporting materials as requested.

Medical Providers Web Page

A web page was created to provide medical professionals with guidance on how to implement radon education into their practice at: <http://www.health.state.mn.us/divs/eh/indoorair/radon/medical.html>. It will have downloadable materials including: the radon brochure, test kit coupons, a step-by-step guide for providing education, information release forms, and a way for providers to report results to the radon program.

Future plans for the website will involve an online documentary about lung-cancer treatment and videos of medical professionals giving presentations on radon.

Nurse Practitioner Outreach

The Indoor Air Unit has partnered with several oncology clinics throughout the state whose staff, primarily nurses, provide radon education to lung cancer patients and their families. The MDH radon brochure is given to patients along with a test kit and information release. Patients are given the contact information for the radon program if they have any questions about testing. The information release provides the program with owner contact information so that they can be contacted at a future date regarding their results.

This model was developed by Michele O'Brien, an oncology nurse navigator for Minnesota Oncology, who introduced it at the Radon Medical Forum event. It has been piloted at Minnesota Oncology Clinics and has since moved to several clinics throughout the state. Through Michele, the radon program was able to make contact with several medical organizations with an interest in radon education.

In June of 2010, MDH staff attended the fourth annual Thoracic Oncology Nursing Conference in Minneapolis. In attendance were over 35 oncology nurse navigators, who are responsible for guiding cancer patients through the treatment process. In this capacity, they are a vital part of the cancer community, as they are a

source of knowledge and support and are respected by both patients and other medical practitioners.

Developing a working relationship with oncology nurse practitioners willing to educate patients

about the dangers of radon is a great way to disseminate radon information to a motivated population. Though radon testing is a preventative measure, the education has been well received by the patients and nurses providing the education. It is seen as a controllable, actionable step that can be taken at a time when many patients feel powerless. Testing for radon empowers patients to take action to protect their own health and the health of their loved ones.

Additionally, a relationship with the Oncology Nursing Society (ONS) of Minnesota was established through contacts with nurses. Most notably, this relationship resulted in the opportunity for MDH staff to give a one hour presentation on radon to over 200 current and retired oncology nurses. The presentation was very well received and the radon program has been invited to give similar presentations to ONS chapters throughout the state.



Medical Community

Publications in Medical Journals

While making arrangements for the medical forum in May, radon program staff made contact with Minnesota Physician Publishing (MPP), a company that releases six different publications for the Minnesota medical community. Subjects generally include current research and thought on health care policy, medical business, and human research management.

Minnesota Physician is a monthly newspaper published and distributed by MPP to every licensed physician in the state, of which there are approximately 15,000. It covers the business of health care and provides timely information on relevant topics for the Minnesota medical community. Radon was selected as a featured topic and an article was requested of MDH staff; the article was coauthored by Dr. Joseph Leach, Michele O'Brien, MSN, and Andrew Gilbert of the radon program.

The article, "Radon Hazards: Educating Patients, Reducing Risk," provides information on radon history, risk, and the importance of testing (11/2010). It goes on to make an argument for why the medical community must get involved by encouraging patients to test their homes and describes some of the educational models currently being implemented in partnership with MDH. The article ends with a call to action for doctors and nurses to begin talking to their patients about radon.

Once the article was approved for publishing, an editor from a corresponding publication, Minnesota Health Care News, approached the radon program and asked for a similar article to be written for a general audience. Over 40,000 copies of Minnesota Health Care News are distributed monthly to clinics, hospitals, pharmacies, libraries and community centers in Minnesota.

Again, the article was written in collaboration with Dr. Joseph Leach and Michele O'Brien. The article provides basic information on radon, its risk potential in the state, how to test for it, and what to do if a test comes back high. It highlighted some of the programs at MDH such as the Minnesota Gold Standard in new homes and the initiative by MDH to provide kits to local public health agencies so that readers know where they can obtain kits locally. The article once again ended with a call to action; though instead of patient education, readers were asked to test their own homes. The article will be published in January 2011 to correspond with National Radon Action Month.

Outreach to Primary Care Clinics

Outreach to primary care clinics differs slightly from outreach to nurse practitioners. The larger number of patients and the wider variety of medical conditions makes adoption of active radon education less of a priority in the eyes of clinic administrators. In order to meet clinics' individual needs, the radon program offers a variety of resources to primary care clinics.

The most important radon resource that MDH has to offer clinics is its radon brochure. Several clinics throughout the state have begun placing brochures in clinic waiting rooms; giving patients the opportunity to be educated while they wait and to also bring the brochure home with them at the end of their appointment. Some clinics have also placed coupons for radon test kits alongside brochures.

The MDH radon program also gives presentations to clinic staff upon request. The twenty-minute presentations provide doctors, nurses, physician assistants, and other clinic staff basic education about the importance of testing for radon. They are encouraged to test their own homes and to also place radon brochures in clinic and hospital waiting rooms. This has been an effective way to build relationships with medical providers and may lead to further partnership opportunities through references or increased clinic programming.

EPA 2010 Regional Meeting

A Prescription for Radon:

A Medical Forum was held in Minneapolis on May 6th, 2010. The forum featured nationally recognized radon experts Dr. Bill Field and Dr. Rich Guimond; oncology researcher Dr. Joseph Leach; oncology nurse navigator Michele O'Brien; lung cancer survivor Barbara Sorgatz; and two representatives from A Breath of Hope Lung Foundation, Mary Jane Mckean and Barb Neitge.

Topics included the history of radon, the most recent scientific studies that support radon's causal relationship with lung cancer, and what resources are available for medical professionals to educate patients on how to reduce their radon related lung cancer risk.

Despite limited attendance by the medical community, the event offered many positive outcomes. Primarily, the event gave Midwestern radon stakeholders a chance to strengthen partnerships and build new relationships. Attendance was just under 50 people and groups represented included the medical community (primarily cancer nurses and physician's assistants), the radon industry, local and state health departments from the Midwest, a local fire department and several nonprofit organizations.

The forum also led to an opportunity for radon program staff to coauthor two articles with Dr. Joseph Leach and Michele O'Brien, give several presentations to groups of medical professionals, and have an objective related to radon reduction included in the five year Minnesota Cancer Plan.



Photo Courtesy of: MDH Radon Program

Community Programs

City of Minneapolis

In May of 2010, MDH staff reserved an information booth at Greening the Heartland, a conference for organizations and individuals with an interest in environmental initiatives. While there, staff met a representative from the Minneapolis Department of Regulatory Services (DORS), who was interested in discussing how Minneapolis could take more action on radon.

The Minneapolis DORS was interested in including language in their regulatory standards that require all landlords to have a radon test performed in rental properties, of which there are about 19,000 in Minneapolis. MDH provided guidance on language and recommendations for testing and mitigation procedures.

In order to increase the radon awareness of Minneapolis residents, DORS, in partnership with MDH, held a test kit giveaway event on October 28, 2010. City employees and residents of Minneapolis received a free test kit by coming to the DORS office. The event had a Halloween theme and some staff members dressed in costume. The Radon Tee was there for photo opportunity with the City Coordinator of Minneapolis. All recipients received radon information and were given hands on instruction as to how and where to perform the radon test.

Over 300 test kits were given away that day and the event received coverage from over a dozen news agencies throughout the Twin Cities area. The coverage highlighted the radon risk of Minneapolis residents, the test kit giveaways, and that the Department of Regulatory Services will begin selling low-cost test kits to Minneapolis residents. The kits will be provided by MDH as part of the outreach initiative to local agencies.



Photo Courtesy of: MDH Radon Program

Local Public Health (LPH)

LPH agencies are closest to the communities they serve and play a vital role in the protection of the public health. MDH recognizes this and provides support to LPH agencies to increase their efforts to address radon in their communities. In support of LPH, in 2011, we will supply them with over 4000 brochures and 3800 short-term and 575 long-term radon test kits for sale and distribution in their communities.



Radon Tee

Radon Tee is a t-shirt that was originally designed for the organization Cancer Survivors Against Radon (CanSar) and prominently displays the words "reduce radon." It has since become part of a successful social media campaign that features "Tee" in photos with people all over the world. Radon Tee can be followed on facebook at www.facebook.com/radontee or twitter at www.twitter.com/radontee.

Addressing Disparities

Minnesota Housing Finance Agency

In fall 2009, Minnesota Housing Finance Agency (MHFA) Homes Division staff contacted the Indoor Air Unit concerning radon testing and mitigation. In an effort to work across agencies, disseminate information to Minnesota homeowners, improve indoor air quality, and gather data on the presence of radon in Minnesota homes, staff from both agencies began discussing an effort to help achieve these aims by distributing test kits and integrating testing processes within the Rehabilitation Loan Program (RLP). This effort takes place within a larger interagency and stakeholder radon working group considering the issue in a comprehensive way.

The goal of the Radon Collaboration (RC) is to provide the following to stakeholders:

- 1) Homeowners: information on radon threat, subsidized or free radon testing, quality mitigation work if needed
- 2) Minnesota Housing Program Lenders: subsidized test kits so that testing costs need not be shouldered by the Lender or built into borrower loan, technical resource in MDH
- 3) Minnesota Housing: subsidized test kits for distribution to Lenders, technical assistance resource in MDH
- 4) MDH: Data collected from mitigated and non-mitigated pre- and post-tests, opportunity for increasing issue awareness and for information dissemination

Multi-Family Housing Radon Mitigation Opportunity

The Indoor Air Unit has developed, in collaboration with MHFA, a unique new program designed to benefit the owners of multi-family housing developments in Minnesota. This program will help owners and developers reduce the risk posed by radon exposure in their buildings and increase the value of their properties.

Mitigating multi-family housing developments is particularly effective because it reduces the risk posed to many households with a single system. This economy of scale increases our "bang for the buck."



Quarterly Meetings

The **Minnesota Quarterly Radon Stakeholder Meetings** provide individuals and organizations an opportunity to:

- Learn about the latest radon related activities going on throughout the state
- Network with other radon stakeholders to develop collaborative partnerships
- Be educated on pertinent radon information by those who are working in partnership with MDH
- Gain insight from the personal experience of radon testing and mitigation professionals and professionals from other industries, such as real-estate, who have a direct relationship with the radon industry.

Attendance is generally split between radon industry professionals and representatives from organizations that have been working in partnership with MDH. Each meeting has a predetermined topic that influences attendance (e.g. a real-estate themed meeting will have a large realtor presence).

The stakeholder meetings are generally seven hours in length. Three hours in the morning are devoted to presentations by guest speakers with expertise in topic areas related to radon. Previous topics have included radon resistant new construction, radon risk communication, practices for communicating effectively with homeowners, "Prescription for Radon: A Medical Forum", mitigation cost effectiveness on a statewide level (research presented by Dr. Dan Steck from Saint Johns University), and the value of radon education during home health and safety inspections.

A one-hour networking lunch is provided to participants, during which time an update of the different initiatives going on throughout the state is given. This provides attendees with an idea of which organizations are doing radon related work and allows them to develop professional relationships.

After lunch a group discussion on a predetermined topic is facilitated by MDH staff. These topics are related to the radon testing and mitigation industry and allow the industry professionals to share their successes and challenges with others. The discussion time has been found to be the most valuable to mitigators as it allows them to participate. During this time ideas for future stakeholder topics are proposed by attendees. This ensures that future meetings are unique and pertinent to the Minnesota radon community.



Quarter One - Radon Resistant New Construction

Radon Resistant New Construction How-to

Risk Communication

Effective Communication

Quarter Two - Radon in the Medical Community

The Evolution of Radon in America: A Historical Perspective

The Health Risks of Radon: Epidemiological Studies

Lung Cancer: It's Not Just Cigarettes

Personal Radon Story

Communicating Risk to Patients

A Breath of Hope Lung Foundation

Quarter Three - Better Mitigations is Better Business

Fire Prevention, Home Health and Safety, and the Radon Community: A Collaborative Approach

Radon-related lung cancer deaths and mitigation cost effectiveness in a radon prone region

The Applicability of EPA's New Lead Rule to Radon Mitigators

Quarter Four - Radon in Real Estate, Navigating the Waters

Radon for Realtors

Hard to Mitigate Homes



Photo Courtesy of: Becky Booker

Becky Booker (Healthy Homes Partnerships)

The state of Minnesota is fortunate enough to have a large number of valuable, dynamic radon stakeholders serving to reduce radon risk in a variety of ways. One of the most notable is Rebecca (Becky) Booker of the Spring Lake Park, Blaine, and Mounds View (SBM) Fire Department. Through her efforts, the message of radon risk reduction has been introduced in an innovative new way and with groups who have not historically been part of the radon conversation.

A cancer nurse by training, Becky is supremely qualified to disseminate a message about the health risks of radon. She has attended the Midwest Universities Radon Consortium radon testing course and is quite familiar with the issue of radon in the state. What's more is that Becky has a contagious enthusiasm and passion for protecting the health and safety of Minnesotans. She is truly an inspiration for those of us working in public health.

Becky has been a firefighter with the SBM Fire Department for twelve years. She has been responsible for an initiative to provide in-home fire and home safety visits in an effort to prevent fires from starting, rather than continuing the traditional approach of suppressing fires that have already started. Largely through her efforts, the rate of home fires in her jurisdiction fell 28 percent. During this time, the rate of home fires in neighboring jurisdictions increased by as much as 17 percent. These results make SBM one of the most effective fire departments in the country.

This type of fire prevention and education takes the form of Home Safety Surveys, where a fire fighter from the department walks through each room of a home with a homeowner and educates them on the possible causes of fire, and what they can do to protect themselves and their families. These surveys generally take about one hour.

After the program started, other agencies and organizations quickly recognized the potential value of having a uniformed officer in the home providing education on fire prevention and home safety. The local police department trained the fire fighters on crime preven-



Photo Courtesy of: Becky Booker

Partner Spotlight



Photo Courtesy of: Becky Booker

tion, which is now a standard part of the survey. Additionally, MDH has partnered with SBM to provide education to homeowners on a variety of healthy homes issues. Participants receive a free radon test kit, which is placed by the fire fighter. MDH is able to track the results of the kits and follow-up with homeowners if warranted. Several hundred homes have been tested through this partnership.

The results of Becky's work are receiving international attention in the fire safety community. Becky has traveled through the state, country, and world sharing her message of home safety through collaborative partnerships. Her presentations always mention her partnership with the MDH radon program as an example of an effective partnership and recommends that radon education should be a part of any home safety survey.



Photo Courtesy of: Barb Neitge

Advanced Diagnostics Contractor setting up to mitigate Barb Neitge's house.



Photo Courtesy of: Barb Neitge

In Memory: On August 6, 2010, Shorewood resident and radon testing advocate Barb Neitge lost her brief battle with radon-induced lung cancer. Her home of 16 years had radon levels of 39.9 pCi/L. Barb's generous spirit and tremendous courage continues to serve as a reminder to us all of why the work we do is so very important.

Summary

This year has been mostly defined by the current economic conditions. It has given everyone reason to reflect, evaluate and realign their purpose. The same is true for the radon program, with the slow economic growth and a challenge from the EPA to increase the effectiveness of all our programs and projects. We reformatted and realigned our education and outreach to increase the impact of all aspects of the radon program.

We reformatted our approach to how we educate and inform Minnesota citizens about radon. The plain fact sheets that we have been using for 20 years did not capture our audience or generate interest. Our approach to get more people interested in radon is to create new, intriguing and engaging graphical education through brochures and enhanced web content.

We realigned our programs to increase our effectiveness through collaborative partnerships. Our year was defined by the partnerships that we created and the effectiveness of pooling resources. The combination of our brochures and partnerships showed us that when the radon program can create the tools, our partners can perform outstandingly. We were able to make large strides in the social justice and medical communities through our partnerships and will continue to in the years to come.

Through the success of reformatting our radon education materials, we are looking to incorporate these themes into a new Healthy Homes program. This will be a great opportunity for the radon program to increase the visibility of radon to an audience that may only have been interested in one aspect of healthy homes.

Moving Forward



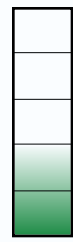
Americans on average spend approximately 90 percent of their time indoors with the largest percentage of that time spent within their homes. Therefore, housing conditions and indoor environments can significantly affect public health. Occupants of substandard housing units are at increased risk for fire, electrical injuries, falls, rodent bites, and other illnesses and injuries. Indoor environmental quality issues of concern include exposure to pesticide residues, indoor toxicants (lead, asbestos, radon, VOCs), tobacco smoke, and combustion gases.

The short term goal of MDH Healthy Homes Program is to implement comprehensive preventive and corrective measures to address housing-related health and safety hazards and to establish and nurture working relationships between housing and public health agencies across Minnesota. The long-term goal is to sustain collaborative relationships and projects that will help ensure that Minnesotans are in homes that are consistent with the seven principles of a healthy home: dry, clean, well-ventilated, pest-free, contaminant-free, safe, and maintained.

Next year will bring great challenges and successes. With our focus on increasing the awareness of the Gold Standard for Radon Resistant New Construction, increasing the effectiveness of our partners and the incorporation of radon in healthy homes education materials, we should be able to start reducing the gap between new homes with elevated radon and the number of homes being mitigated every year.

STATE INDOOR RADON GRANT MEASURES

Progress



1) Testing and mitigation of homes.

- a. Estimated number of homes mitigated in State:
 October 1, 2009 – December 31, 2009 = 211
 January 1, 2010 – March 31, 2010 = 266
 April 1, 2010 - June 30, 2010 = 340
 July 1, 2010 - September 30, 2010 = 183
 Total Mitigation Reported: 1,152
- b. Estimated number of homes tested in State:
 11,372 Radon tests were reported from 14 laboratories
- c. Number/list of mitigators:
 There are 48 Radon Mitigation Service Providers listed with the Minnesota Department of Health
- d. Other: N/A

2) Radon-resistant new construction techniques in new homes.

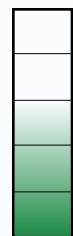
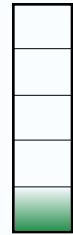
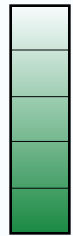
- a. Estimated number of homes built with RRNC to accepted specifications: 7,090
- b. Estimated number/list of builders using RRNC techniques: 14,500
- c. Estimated number of builders working with the States on RRNC: 8
- d. Number/list of local jurisdictions with building codes requiring RRNC and the population in those areas:
 Statewide RRNC requirements, 5,303,925 citizens
- e. Other: N/A

3) Testing and mitigating schools for radon and RRNC in new schools.

- a. Number of schools mitigated:
 2 schools mitigated with sub-slab depressurization
 5 schools mitigated with air flow modifications
- b. Number of schools and/or classrooms tested:
 22 schools were tested
- c. Number of schools built with RRNC features: N/A
- d. Number/list of builders using RRNC in school construction: N/A
- e. Other: N/A

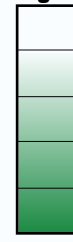
4) Activities that improve the effectiveness and viability of the program.

- a. List of activities and description of how they have led to or will lead to increased action and results, and the magnitude of those results:
 New Radon Education Materials:
 6,000 brochures distributed, increased awareness leads to increased testing
 89,253 web hits on the radon education page, increased awareness leads to increased testing
 2,870 downloads of the radon mitigator list, increase consumer confidence increase the number of mitigations



STATE INDOOR RADON GRANT MEASURES

Progress

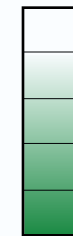


5) Developing coalitions that work in partnership with local governments, partner affiliates, and others interested in reducing the risk of radon.

- a. List of coalition partners:
 - i. American Lung Association (ALA)
 - ii. American Cancer Society (ACS)
 - iii. Local Public Health Association (LPHA)
 - iv. Sustainable Resources Center
 - v. Minnesota Housing Finance Agency (MHFA)
 - vi. Minnesota State University Mankato
 - vii. Minnesota Cancer Alliance
 - viii. Habitat for Humanity
 - ix. Realtor Association of Minnesota
 - x. Oncology Nursing Society
 - xi. Minnesota Environmental Public Health Tracking Program
 - xii. National Association of Home Rehabilitation Officials
 - xiii. Minneapolis Department of Regulatory Services
 - xiiii. Minnesota Pollution Control Agency
 - xv. Spring Lake Park, Blaine, Moundsveiw Fire department
 - xvi. Park Nicollet
 - xvii. Breath of Hope Lung Foundation
 - xviii. Kaplan
 - xix. Piper Lung Cancer Program
 - xx. Saint Paul Lung Clinic
 - xxi. General Mills
 - xxii. Neighborhood Associations
 - xxiii. CLEARCorps USA
 - xxiiii. Minnesota Association of School Maintenance Supervisors

6) Implementing innovative radon awareness activities.

- a. Activity and description of increased awareness:
 See sections above.



Credits

This booklet provides information from the Minnesota Department of Health (MDH) on radon and the State Radon Program. The U.S. Surgeon General, the U.S. Environmental Protection Agency (EPA) and MDH recommend that every home be tested for radon.



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For more on MDH's **healthy home** programs that cover issues such as lead, carbon monoxide, mold, asbestos and more: www.health.state.mn.us/divs/eh/homes/index.html