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**REPORT ON RADON AND REAL ESTATE PROBLEMS
IN EASTERN PENNSYLVANIA**

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APRIL, 1990

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January- April, 1990.)**

ACKNOWLEDGEMENTS

This project was made possible with the cooperation of:

The Pennsylvania Association of Realtors, the Boards of Realtors of Philadelphia, the Main Line, Harrisburg, Bethlehem, Reading, and in Delaware, Chester, Bucks, and Montgomery (Eastern/Central/North Penn) counties; and the realtors interviewed in those counties.

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Joseph T. Piotrowski, Chief, Permits Enforcement Branch, and Carol Amend, Chief, Program Management Section, Water Management Division, who agreed to a three month rotational assignment for the author under the Greater Leadership Opportunities (GLO) program.

Executive Summary

Under our mandate to assist the State and design public information projects the Region III Radon Program included realtors in its outreach efforts, and in January, 1990, began a radon outreach project to realtors in eastern Pennsylvania.

Meetings were held with representatives from the Pennsylvania Association of Realtors (PAR), with county Board of Realtors executives of Philadelphia, the Main Line, Harrisburg, Bethlehem, Reading, and in Delaware, Chester, Bucks, and Montgomery counties to find out their problems, and to advise them of the resources EPA/DER have available on radon. Individual interviews and five focus group interviews were also conducted. Approximately thirty five real estate agents provided comments in either individual or group interviews for this project.

The Pennsylvania Association of Realtors advises its members to encourage radon testing, and to use its radon disclosure forms. The PAR recommends that realtors use the Radon Disclosure Addendum to Exclusive Right to Sell Agreement, which the agent and seller sign when the seller lists a property for sale with a real estate broker, and the Radon Disclosure Addendum to Agreement of Sale, which is used when the buyer presents a formal offer to purchase a property. These forms are based on the duty of the seller and his agents to disclose defects to the buyer which could influence the decision to purchase. Failure to do so could make the seller and the realtor liable if radon is found after settlement on a property. Since the seller may not know that radon is present, giving the buyer the opportunity for a radon test gives the buyer information on a hidden defect which may influence the decision to purchase a property.

Realtors identified problems with short and long term tests in real estate transactions, with seller disclosure of radon, with sellers being penalized for radon problems, with escrow of funds for radon repair, with public education scare tactics, and with lack of buyer/seller knowledge about radon.

The realtors interviewed seemed receptive to EPA efforts to find out about their problems, and interpreted this as a way for EPA to avoid an adversarial role with realtors. Generally, just about all realtors interviewed had been to at least one training seminar on radon, and seemed knowledgeable about radon and mitigation. Many realtors felt that they had been saturated with training on radon.

Realtors identified solutions to the problems they encounter. The public needs more clear cut guidance on radon levels between 4 and 20 pCi/l, especially for real estate transactions. There is

a need for clear cut guidance for real estate transactions which takes into account the lack of time for long term testing. EPA should encourage homeowners to test for radon before homes go on the market. Realtors themselves believed that the National Association of Realtors and EPA should work together more on radon since it is a national problem, and guidelines for dealing with radon are needed. Realtors saw a need for clear information on risk and exposure for the public. They also thought that a more consumer-oriented look at types of remediation, and how geography and construction affect cost, would help the public. They believed that EPA/DER education programs on radon for realtors and for the public should emphasize non-technical, concise facts on how to solve radon problems. Realtors, and ultimately the general public, need solutions to practical problems.

This project was an effort to determine how realtors perceive radon problems, and to document how the Agency's radon policies are affecting the public. Acting on this information is important to the success of communicating the risks of radon. EPA should continue to pursue opportunities to look at how the general public perceives radon so that the Agency will accomplish its goal of increasing radon testing. EPA has a wealth of radon data but must recognize how confusing the information on radon is to the non-scientist. The Agency must keep sight of what the public needs to know as it continues to find new ways to communicate the risks and implications of radon.

1. PURPOSE OF PROJECT

The Toxic Substances Control Act gives the Agency its mandate for indoor radon abatement and sets the long term goal of having the air within buildings in the United States to be as free of radon as the ambient air outside of buildings. The Act gives the Administrator the authority to develop and implement activities to assist State radon programs. EPA technical assistance to the States includes design and implementation of public information and education programs. Less than 3% of homes nationwide have been tested, and the Agency's goal is to encourage every homeowner to test for radon. Under its mandate to assist the States with public information projects, and with the staff resources provided under the Greater Leadership Opportunities program, the Region began a radon outreach project to realtors in eastern Pennsylvania in January 1990.

The Region and the Pennsylvania Department of Environmental Resources have worked since 1985 to educate the public and realtors on radon, and EPA Headquarters has been working with the National Association of Realtors. At the start of the project, the Region wanted to find out about the impact of radon on residential real estate sales and prices, the frequency of cancelled sales contracts, and the desirability of a property after radon remediation.

EPA Region III wanted to help realtors and the public deal with radon. EPA wanted to make sure that realtors know what information is currently available to help them and home buyers and sellers deal with this issue. Since realtors work closely with the public and see the daily problems of residential radon testing, the Region believed there was a need to work at the state/local level to document these problems and to provide a report to policymakers working to resolve them.

This project was not intended as a formal survey of realtors, but a first step in determining whether further research is needed. The Region will share its findings with Pennsylvania, the other States, and with the county Boards of Realtors. This may be a basis for a more formal national study of realtors in the future.

2. METHODOLOGY

To begin the Radon Real Estate Outreach Project, Region III Radon staff met with the Director of Pennsylvania's Radon Program to refine objectives and address State concerns. The Region chose eastern Pennsylvania for the project because there were a variety

of radon problems in the area, and its proximity to the Regional office in Philadelphia would allow interviews within a short period of time.

EPA and DER staff met with the Director, Member and Board Services of the Pennsylvania Association of Realtors (PAR), to introduce the project, find out about the role of the PAR, and to get support for the project. PAR provided names of County Board officers for interviews.

Next, during February and March, there were meetings with Board of Realtors executive officers or presidents in Philadelphia, the Main Line, Harrisburg, Bethlehem, Reading, and in Delaware, Chester, Bucks, and Montgomery (Eastern/Central/North Penn) counties to find out their problems, and to advise them of EPA/DER resources on radon.

Individual interviews and five group interviews were conducted with realtors chosen at random, or recommended by Board officials because of their experience with radon. Many county realtor Board executives were also realtors who could discuss the radon problems encountered in real estate. Group discussions on radon problems resulted at the initiative of brokers in charge who invited the agents in their offices to take part in discussions. Groups contained a minimum of four and a maximum of seven agents. Approximately thirty five real estate agents provided comments in either individual or group interviews for this project.

The County Board President or Executive Officer, and individuals/groups received a package of radon materials which included a list of EPA/DER radon publications, names and phone numbers of EPA/DER radon staff, copies of a Citizen's Guide to Radon, Radon Reduction Methods, Radon Information (a fact sheet prepared by the Region), Pennsylvania's Guide to Radon Reduction Contractor Selection, and Certified Radon Services Listing, and a Map of Percentage of Radon Readings Above 4 pC in Pennsylvania (plotted December 18, 1989).

3. OVERVIEW OF PENNSYLVANIA REALTORS' EFFORTS: HOW REALTORS IN PENNSYLVANIA DEAL WITH RADON

Role of the Pennsylvania Association of Realtors and County Boards of Realtors

The Pennsylvania Association of Realtors (PAR) is a professional real estate organization which has approximately 29,000 members. Its purpose is to encourage investment in real property and to maintain a high professional standard of conduct among its members in accordance with the National Association of Realtors' Code of Ethics. This Code of Ethics exists to improve

realtor professionalism and protect the consumer. PAR helps its members increase their skills and knowledge of the real estate industry by providing real estate courses and standard forms, publishing a monthly newsletter, the Pennsylvania Realtor, and serving as a resource in legal matters. PAR also gives advice on how to run county Boards, which serve the same purpose at the local level.

Explanation of Radon Disclosure Forms

The Pennsylvania Association of Realtors has a Standard Forms Committee. Both the PAR and realtors in the counties where radon was first found recognized the potential radon liability problem and believed that realtors had a responsibility to inform buyers/sellers about radon based on the duty to disclose property defects. Any broker or local Board can develop forms, and the PAR requests that local Boards submit these forms for review.

The Pennsylvania Association of Realtors advises and strongly urges its members to encourage radon testing, and to use the disclosure forms, but does not force the use of the recommended form. As a professional association with voluntary membership, it does not impose restrictions on its members. It would take a government action to make the use of the form mandatory.

The PAR recommends that realtors use two forms: the Radon Disclosure Addendum to the Exclusive Right to Sell Agreement, which the agent and seller sign when the seller lists a property for sale with a real estate broker, and the Radon Disclosure Addendum to Agreement of Sale, which is used when the buyer presents a formal offer to purchase a property.

These forms protect the interests of realtors, buyers, and sellers. Realtors and sellers gain protection from liability with use of these disclosure forms. The seller, or his agents, must disclose to the prospective buyer known defects that will adversely affect the property. The real estate agent, though paid by the seller, has a duty to disclose material, latent defects to the buyer. There is the possibility that a seller or a broker could be sued on breach of warranty, negligence, or failure to disclose, if radon is discovered after settlement. Since the seller may not know that radon is present, giving the buyer the opportunity for a radon test gives the buyer information on a hidden defect which may influence the decision to purchase a property.

The Pennsylvania Association of Realtors revised these forms in January, 1990. Realtors discussed the old form during interviews, so it is not possible to assess how the revisions may have affected realtors' perceptions of problems. The realtors believed that the forms were helpful in establishing a procedure for dealing with radon tests in residential real estate transactions.

1. Radon Disclosure Addendum To Exclusive Right To Sell Agreement

This form includes a "Notice to Sellers Regarding Radon Gas" which explains what radon is, its origins, and affects. The form protects the seller and the real estate agent from potential liability by requiring the seller to disclose knowledge of the presence of radon on the property, the date and the type of radon test, and the date and method of radon reduction. The form includes a statement that the seller does not warrant either the method or result of the test.

The revised form requests the seller to provide more details such as test dates, methods, results, and radon reduction methods used. The revised form also added statements that the seller may be required to provide details of any testing or radon remediation, including copies of test reports, and that the seller agrees to make property available for testing during the term of the listing agreement. The property owner and the agent sign the form.

2. Radon Disclosure Addendum To Agreement Of Sale

This form gives the buyer the right to have the property inspected for radon at his own expense, by a certified inspector, within a certain number of days from date of execution of the agreement of sale. The buyer, the seller, and the agent sign the form. If the inspection shows radon greater than 4 pCi/l, the buyer must give the seller a copy of the test results, and the seller may then submit a corrective proposal, in writing, to the buyer. Upon receipt of the corrective proposal, the buyer has five days to accept the proposal in writing, which releases the seller and his agents from liability, or the buyer can declare the agreement null and void, and all deposit monies shall be returned to the buyer.

4. BACKGROUND SUMMARY OF LITERATURE

As a first step in understanding the realtor's point of view, a literature review was done to research the types of problems radon had caused in real estate transactions. As of March, 1990, the literature search revealed articles which described theoretical concerns about testing accuracy, disclosure and liability problems, and the need for public education. These articles were important in setting the context for the issues raised by realtors in interviews for this project.

Articles describe the need for radon testing to be done quickly to complete a real estate transaction, while at the same time, buyers and seller need accurate and reliable results. The literature also identifies a need to calibrate and standardize testing procedures so buyers can rely on the results. Many factors

influence radon concentration such as season, location of detectors, duration of test, conditions at the test site, and seller control of the property during the test. This variability may lead to the potential legal problem of getting reproducible results.

The real estate industry articles described a need to establish legal standards to judge the conduct of real estate brokers and agents when dealing with radon which consider the knowledge and capabilities of agents and the limits of their knowledge. There is a need to protect the home buyer from possible exposure to radon, and to protect the seller and the broker from liability. The use of radon disclosure clauses to protect the buyer and seller, and the creation of escrow accounts to cover potential radon mitigation costs after settlement are suggested.

The literature search revealed the need for consumers and professionals to improve their ability to recognize and understand radon problems, and for buyers to have enough definitive information on radon levels and health risks to judge the seriousness of a radon problem. Buyers may not know what test data means and expect the real estate agent to interpret.

While the findings of this outreach project are anecdotal, the literature review documents the problems realtors see with radon testing, disclosure, and public education. Studies of the affect of radon on real estate, the problem of remediation based on short term tests, or the need for specific real estate guidance, do not appear to exist.

5. FINDINGS

General Realtor Perceptions of the Problems of Radon Testing in Real Estate Transactions

Realtors pointed out that buying and selling a home induces anxiety in general, and the discovery of radon can increase that anxiety. Affordability and repairs after the fact are general issues of concern for home buyers. They are also concerned about resale value and radon, and this can be true even if the radon problem has been fixed. Buyers may have doubts and experience "buyers' remorse" after signing an agreement of sale. The discovery of any flaw in the property may cause them to question their decision.

The radon disclosure form suggests the option of a radon test to buyers. If buyers are uncertain whether to order a test, most realtors seem to advise testing. One realtor pointed out that "emotions run high, it's better for buyers to know about radon and be reassured."

In general, buyers and relocation companies are more likely than sellers to test for radon. If buyers are from outside a "high radon area", they seem to have more fear of radon. Some realtors believe that many buyers don't test the homes they already occupy.

Relocation companies appear to require radon tests and remediation even between 4 and 20 pCi/l based on a short term test. Some buyers test even though the seller has already tested, but it is impossible to say how frequently this happens. While actual numbers are difficult to verify, many realtors estimated the number of buyers who requested radon tests. One Board executive in a high radon area estimated that 90% of homes up for sale have radon tests. Two offices close to New Jersey, with buyers from the New York-New Jersey area, estimate that about 95-98% of buyers want radon tests. Another company estimated that about 50% of buyers want a radon test.

While it is difficult to quantify, most realtors interviewed had at least one transaction cancelled when a test showed radon greater than 4 pCi/l. Agents at one office estimate about 20% walk away when a radon reading higher than 4 pCi/l is discovered. It is not unusual for some buyers to cancel deals on homes with readings greater than 4pCi/l, but some agents believe that some buyers look for reasons to walk away. There is a belief that some buyers are using radon to nullify sales agreements, in part because of "buyers remorse", and possibly, because of fear of radon.

The radon disclosure forms seems to work well in laying out what needs to be done once high readings result. The radon clause in the agreement of sale gives agents a procedure for dealing with radon tests, repairs, and what will happen if a high radon level is discovered. The buyer makes an offer, and according to the radon clause if the buyer wants to test, the buyer pays for it. If corrective action is needed, the seller has the option to repair or not, and the buyer can accept the seller's proposal to remediate, accept the property "as is" if the seller does not want to remediate, or cancel the agreement. Less experienced agents may have more of a problem dealing with radon issue than more experienced agents; the agent's radon knowledge makes it easier to deal with radon.

If sellers want to sell, generally they must repair, because in many areas, it was a buyers market at the time of the study. In a slow market, buyers have many choices, and can make offers on houses with no radon problem.

Generally, the sales price of a house does not seem to be affected by the presence of radon, according to the realtors interviewed. In one office there was an example of "bad" remediation: a contractor installed an effective unit which was so unaesthetic, the price of the house dropped by \$25,000. This seems to be an extreme case. Some realtors see buyers who use 4+

readings as a ploy for a price reduction, but it was not possible to determine how frequently this happens.

Realtors are viewed as experts by the public and as a result, many Boards get calls from the public on radon in general and about the accuracy of the different types of radon testing in particular. One realtor commented that "radon should not be all on the agent; EPA/DER could do more public education."

Many realtors had questions about whether EPA plans to "tighten the radon limit" to 2 pCi/l. Also, there was some question about why EPA uses 4 pCi/l as the action level, when the number is higher in other countries.

Specific Problems with Radon Testing in Real Estate Transactions.

1. Problems With Short And Long Term Tests In Real Estate Transactions

In The Citizen's Guide to Radon, EPA advises the public to do a short term screening test, in the lowest livable area of the home, with all doors and windows closed during the test. EPA also advises that the test be done during the cooler months of the year. The Citizen's Guide recommends follow-up measurements be made before the decision to correct the radon problem. If the results of the short term test are between 4 and 20 pCi/l, the Agency advises long term follow-up measurements for one year, or of one week duration during each of the four seasons.

This advice can cause problems during a real estate transaction. Many sellers do not test their homes before they decide to sell. A buyer who looks at the house and decides to make a formal offer then has the right to test for radon. The buyer can perform the test or hire a professional. Some realtors raised the problems of the "self test", with the possibility of seller/buyer error in placement, the potential for tampering by the seller, and the two week turn around time for results. One county Board official hears comments that some people think that realtors conspire with testers to profit from radon. The policy of Boards and agents is not to recommend testers or remediators when asked by clients but to give names from the state certification list for a client to make a choice. This puts realtors in a sensitive position when asked to recommend whether a client should self test or use a professional tester which costs more, but gives quicker results.

There are problems with tests in summer with low results, and it is difficult to keep a house closed up for the test when the buyer does not have control over testing conditions. Realtors also questioned whether a 4 or 5 pCi/l reading during the winter is a

cause for concern when the reading is likely to be much lower during the rest of the year.

There is also the problem of placement of the test device: EPA advises the lowest living area, possibly a basement, but many realtors have enough experience to know that there is also the whole house average, or a reading on one level used as a living area. Realtors want to know which is the most reliable method for a real estate transaction.

If the initial screening shows a reading between 4-20 pCi/l, there is not enough time to consider long term testing. Further, the fact that EPA brochures do not advise remedial work on the basis of the charcoal canister has led realtors, especially in areas with many high radon readings, to question the validity and accuracy of the canisters themselves. Their perception is that if the canisters were accurate, EPA wouldn't tell people to do long term testing with alpha tracks to confirm a radon problem.

The potential conflict of interest between companies which both test and remediate is another concern. Realtors are aware of the option to have one firm test and another to remediate, but see a problem because time is needed to get estimates. Some realtors have encountered radon mitigation firms which want to retest before doing remediation.

Realtors almost universally reported that many buyers, and many relocation companies require remediation based on short term test results which show readings of as low as 5 pCi/l. Generally, remediation is based on the short term test unless the seller pre-tests.

2. Perception of Problems With Disclosure Of Radon

There is a burden on both the realtor and the seller to disclose defects such as radon and both can be liable if they fail to disclose defects to the buyer. Realtors work for and are paid by the seller but at the same time must consider the buyer's interest in property defects. Where radon is concerned, some realtors believe the buyer's right to test is not in the seller's best interest. A buyer who makes a formal offer tests for radon and finds a level even slightly over 4 pCi/l may cancel the agreement of sale. Some realtors were concerned that the seller then must disclose the presence of radon to the next potential buyer, possibly making the property less marketable, or raising a red flag to a buyer who may have otherwise been unconcerned about radon.

3. Sellers Are Penalized For Radon Problems Which They Did Not Cause

There was divided opinion among realtors on the merits of seller testing at the time of listing. At the listing phase, the realtor must find out if the seller has knowledge of radon as a defect. There is a burden on both the realtor and the seller to disclose defects such as radon to the buyer and both can be liable if they fail to disclose. Some realtors encourage sellers to test for radon at the time the property is listed for sale with a broker, while others do not. One realtor and Board member recommends a radon test to sellers at listing; however, there is always the risk that if the agent insists on a radon test, the seller can go to one who doesn't.

Some realtors view the radon test as one more test to deal with early in the listing process, which will prevent problems once a formal offer is made. These realtors believe that the listing phase is a good time for a radon test because it will help sell the house. These agents believe that they can prevent problems if they advise the seller to test and use the test report as a marketing tool if there is a low reading. Some agents present the radon test to the seller at listing as a practice to make the house more marketable in the same way a termite certification does, so that when a prospective buyer shows interest in the house, there will be one less problem that could threaten an agreement of sale. Some real estate agencies in one county with a high number of radon readings greater than 4 pCi/l, have given canisters to sellers who have used them to test, but to many buyers, this does not seem to be the same as an "official" test which may cost \$60 or more.

There were some realtors interviewed who view radon testing as something which may hinder a real estate transaction. These realtors don't see radon as a seller's problem because radon occurs naturally and was not caused by the seller. For these realtors, radon problems don't seem to be in the same category as termite problems, which the seller did not cause, but must fix. High radon levels are not generally perceived as the seller's burden to correct. The seller has lived in the house with no apparent problem, so why should he/she fix it? According to one agent, some realtors fearing lawsuits, suggest a radon test. Other agents question the emphasis on residential radon testing and mitigation, when people don't spend all their time at home, and want to know about the risk from radon exposure in offices, schools, and daycare centers.

There was concern that radon testing could penalize the seller in two ways. First, if there is a reading over 4 pCi/l, the buyer might still cancel the sales contract even if the seller fixes the problem. Second, the seller is vulnerable if the realtor recommends a radon test because if radon higher than 4 pCi/l is

found, the seller must disclose even though he did not cause the problem.

Sellers are concerned about the cost of radon remediation, and some agents feel that radon testing poses a financial penalty for the buyer, especially if a professional tester is involved. Many realtors asked the question: is it reasonable for a buyer or a seller to fix a radon problem with a reading somewhere between 4 and 20 pCi/l without a long term test? In one case, the short term test showed a reading of 11, and the seller paid \$1200 to remediate on the basis of the short term test so the house would sell quickly. At another office, the agents found that sellers were usually willing to make repairs if radon is found. They cited one case where the seller refused to make repairs, and the buyer cancelled the agreement of sale. The seller then took the house off the market, and later put it back on the market at a higher price, presumably to recover the cost of radon repairs.

4. Escrow Of Funds For One Year Is A Problem

Real estate literature suggests that an escrow account be set up if a buyer or seller wants a long term test to confirm a radon problem, or if there is a question about the accuracy of the short term screening. Although some realtors say escrow accounts are no problem, there seemed to be strong feeling against their use. Realtors were concerned about who holds the funds, and who determines if the reading is accurate. Realtors pointed out that after settlement, the agreement of sale expires, and establishing escrow accounts to allow for radon mitigation after a year long test clouds settlement. They say that the main issue is that real estate transactions must be explicit about what needs to be done and when. They also said that mortgage companies don't want unresolved problems, and require that all conditions of the agreement of sale must be met before closing.

One realtor cited two cases where there were high enough readings to warrant long term tests and escrow accounts (one held by the realtor, one by the title company). This did not seem to be a problem for the buyer or the seller, but it was not a common event at this office either. In one case, \$1475 was put in escrow, and the realtor was waiting for results of the long term test. The buyer had forgotten that the year was almost completed until the realtor called.

One agent commented that with a more expensive house, the seller may not need the cash, but a seller with a less expensive home or a cash flow problem might be more negatively affected by the temporary loss of cash for an escrow account.

Realtors preferred remediation instead of escrow between 4 and 20, but thought that escrow was a better choice if the short term test was between 4 and 10.

5. Public Information Scare Tactics

There is a view that some radon information has scared the public unnecessarily. Some realtors who saw the Ad Council television spot which showed an X ray of a family, felt that it was a scare tactic, and that unless EPA could point to actual deaths caused by radon, it was better to give the public positive information on the subject. These realtors recognized that EPA has a duty to warn the public of the effects of radon, but questioned the basis of the lung cancer death statistics.

It was not unusual for realtors to see panic at radon readings as low as 5pCi/l. Realtors want the public to understand that a reading over 4pCi/l is "not the end of the world". Some realtors see some buyers who are aware of the potential risk and don't want any radon in a house. There is also a perception, though not widespread, that radon services companies generate scare ads when "things quiet down".

6. Lack Of Buyer And Seller Knowledge About Radon

Realtors see a belief that "everything is ok now, radon is a Reading Prong problem." Realtors in counties with a number of high readings see buyers who are new to the area as more concerned about the presence of radon and as more likely to request radon tests than long time residents who buy in the same area. Long time residents, whether buyers or sellers, seem to accept the radon risk or believe that if you don't see radon, it's not there, or think that "radon has been around awhile, I've lived with it". At one county Board of Realtors meeting, the Board President asked for radon problems from the twenty members present, and there were none to report. This county is not considered a "high" radon area and a lot of buyers waive their right to a radon test and sign the release from liability. Some are so casual that they don't read the radon disclosure form and just write "waived", which is not acceptable to realtors, and defeats the intent of the form.

Realtors offered many anecdotal examples of fear or lack of accurate knowledge about radon can cause problems in actual or potential transactions.

In one case, a buyer tested a property and found a radon level of 14 pCi/l. The seller corrected the problem, but the buyer didn't show up at settlement. Even though the radon level was reduced, and everything done in accordance with the agreement of sale, the buyer wanted to cancel the transaction, and sued the seller to get his \$11,000 down payment back. The case was settled out of court in March, 1990, with the buyer receiving \$7,000, and the seller, \$4,000.

One buyer made a formal offer on a house, had the radon test which showed a number between 4 and 20 pCi/l, and cancelled the deal. The same buyer made another offer on a house, but, according to the realtor, bought it anyway when the radon reading was over 4, because he educated himself and was less afraid of radon.

Many realtors had at least one experience with buyers who seemed interested in a house until they saw radon fan/pipes and showed no further interest in the house. Other realtors said that seeing radon mitigation equipment caused other prospective buyers to make lower offers, although it is not possible to verify the eventual sales prices of these homes.

In one instance a buyer's request for a radon test was rejected by the seller and the deal fell apart, although realtors said that sellers usually agree to test requests.

In another case the buyer tested and found a radon level of 29.6 pCi/l. When the seller refused to remediate, the buyer cancelled the agreement of sale. The agent felt that this penalized the seller who then had to disclose the presence of radon, possibly causing undue alarm in prospective buyers who may have been unconcerned about radon.

7. Comments On Outreach Effort

Most realtors seemed receptive to EPA efforts to find out about their problems. Typical comments were "it's about time someone from EPA talked to realtors"; "EPA is too late, they should have sent someone when the scare was big a few years ago"; "it's good that EPA is taking the time to do this project"; "EPA should be working with realtors at the national level on radon". The general opinion was that EPA/DER outreach to realtors is a good idea, because it will prevent an adversarial role. Five brokers decided that the opportunity to discuss radon problems with EPA was a good use of their agents' time, and invited their staff to participate. It is important to note that the suggestion to have group discussions came from the brokers themselves.

Realtor Comments on EPA/DER Brochures

Local real estate offices determine whether to give clients radon brochures, but the realtors interviewed were all familiar with the Citizen's Guide. Most believed that while it had good, understandable information, it was too long for many people involved in real estate transactions. There was a definite opinion also that since it didn't address real estate time constraints, that a shorter, more specific summary aimed at buyers/sellers would be helpful.

Many realtors liked the radon maps which showed the percentage of readings over 4pCi/l by county in Pennsylvania. They believed that it showed how widespread radon was, and that its pervasiveness was an important point for the public to understand.

Generally, just about all realtors interviewed had been to at least one training seminar on radon, and most seemed knowledgeable about radon and mitigation. Many realtors felt that they had been saturated with training on radon.

Realtors and Board executives believed that the DER Guide to Radon Reduction Contractor Selection and the Certified Radon Services Listing were useful. Some were not familiar with these materials. Many realtors are asked to recommend testers or mitigators, which is risky for the realtor, and the certified list would remove this burden.

6. RECOMMENDATIONS

EPA and the State have the challenge of informing the public of the risks from radon exposure while relieving their anxiety about radon. Both agencies must educate the public on different levels. Some people will respond to health warnings, while others will respond to the possible financial impacts of radon when buying or selling a house. There is a role for diverse groups such as the Lung Association and the League of Women Voters to assist EPA and the state in educating people about the health risks, real estate impacts, and consumer protection aspects of radon.

The following specific recommendations address the problems identified in this report:

1. Need For Clear Guidance For Real Estate Transactions

The Citizen's Guide does not specifically address real estate transactions. It does not consider the time limits facing the public, nor does it help buyers decide what to do if the home they are interested in has a radon problem and there is not enough time to do a full year of testing. Realtors wanted to know where testing devices should be placed and how to interpret results for real estate transactions. Realtors identified a need for information that realtors and the buying/selling public can use to make decisions. A condensed version of the Citizens Guide that answers these questions would be helpful for real estate transactions.

2. The Public Needs Clear Guidance On Radon Levels, Especially For Real Estate Transactions

Realtors see a need for a range of values, to allow for testing variation, so that people won't panic when a radon reading

of 4.2, 5, or 6 pCi/l is found. Many people don't know what to do if a reading over 4 is found, and realtors must be careful in advising clients on what to do about radon. The question realtors hear from clients, is "what is the acceptable radon level, and who decides the acceptable level?", and "how much variation over or under 4 is acceptable?" The closer to 4 pCi/l, the bigger the problem for the seller, and the more likely there will be disagreements between parties in the contract. Realtors believe that the prospective buyer/seller needs to know what to do with a short term radon level between 4 and 20 pCi/l, and whether remediation at 6pCi/l is advisable.

3. EPA/State Outreach Should Encourage Homeowners To Test For Radon Before Homes Go On The Market

According to realtors, EPA and DER are in a good position to encourage testing because they have no financial interest in raising radon awareness and should capitalize on that position. Non-technical programs on radon for realtors and potential home sellers would be helpful. Some suggested that the State and EPA simplify testing for the public and make it inexpensive by giving canisters to the general public.

Realtors believed that EPA should emphasize that long term tests would be much more reliable and that the results would make a house more marketable. This outreach should encourage homeowners by letting them know that if they don't test, they may have more problems later on. People also need to know for how long the test data is valid.

4. Need For More Outreach To Realtors

Many realtors expressed a desire to see EPA and the National Association of Realtors (NAR) cooperate on radon policies and education. They suggested that the national publication, Real Estate Today would be a good vehicle for articles on radon, and that it was important for EPA to work with NAR since radon is a national problem.

Although many realtors say they have had enough radon education, and most seemed to know basic facts, there is still confusion on how radon facts in the Citizen's Guide apply to real estate. There is also a need to train new realtors, which is the managing broker's responsibility, but EPA and the State could help by providing speakers on radon or submitting articles to realtor newsletters. EPA and the State could solicit opportunities by approaching county realtor boards and offering to speak at orientations for new realtors.

State and county boards showed interest in accepting state or EPA articles for their newsletters. If the State wanted to increase radon awareness and increase radon testing, it could

target specific counties, and submit newsletter articles as a follow up to this outreach project. Agents said that they could use information on the types of tests (canisters, alpha track), the differences between long and short term tests, and the costs of do it yourself versus contractor remediation. Names and phone numbers of contacts at EPA/DER could also be submitted to these newsletters.

Realtors and the public need to be reminded that they can call the State or EPA to get answers on radon questions. Local board officers and some individual realtors referred buyers with questions to DER, but not enough realtors seemed to be aware that they or buyers could get answers to their questions by calling either agency. There is a need for realtors to know more about how DER can help home buyers and sellers with high radon readings. A radon business card with some radon facts and State/EPA phone numbers or a Rolodex card with phone numbers would help agents to prepare clients in the early stages of a transaction.

5. Need For Clear Information On Risk And Exposure

In general, realtors felt that the public could benefit from better information to answer the question: what are the risks from radon? There is a need not for more data, but for better interpretation of data. Clear explanations of current risk information should be available to the public. Some realtors accepted that testing is important because of the potential health risks, while others questioned how EPA arrived at lung cancer estimates. EPA can assume that this reflects the attitude of the general public. Some people resist scare tactics on lung cancer. Others want to know: how many people have actually died from lung cancer attributed to radon? Realtors see a need for good, accurate information from the State and EPA.

6. Need For More Consumer-Oriented Information

Realtors believed that giving the public cost data on radon testing and remediation would be a good idea. They suggested articles on the cost of different types of remediation, and how geography and construction affect cost. One realtor suggested that it would help the public if EPA would publish a regional study of the average cost to remediate.

7. CONCLUSIONS

Implications for EPA/DER Outreach Efforts

At the start of the project, the Region wanted to find out how high radon levels affects residential real estate and if radon mitigation affects property sales. At the end of the project,

there was no quantitative data to answer these questions because there is no data base which tracks real estate transactions by sale price and radon level. There was some information that supported the conclusion that radon mitigation may stigmatize a house.

This report analyzes perceptions and anecdotes on radon problems, which still has value to EPA. After hearing similar stories from many realtors, it became apparent that realtors are in a position to critique the strengths and weaknesses of current radon policies and public information materials because they see how the public interprets radon policy and how EPA guidelines are being implemented. Their analysis of the problems can help EPA and the State understand the public's perceptions of radon and to use these insights to plan future public education efforts. EPA can use that knowledge to improve outreach in other states as well.

This outreach project is another step in building cooperation between EPA and realtors in helping the public deal with radon and its risks. EPA and the state should take advantage of the opportunity to submit articles to real estate newsletters at the national, State and county levels which address the problems identified in this report. Realtors in eastern Pennsylvania are very well informed about radon, but they need solutions to the problems they encounter in real estate transactions.

The Region should share its findings with the states, with realtors, and with Headquarters. There is potential for EPA to work with Realtor Boards in other states. By making an effort to understand how radon affects real estate, and acting on the major problems identified by realtors, the public can benefit. There is potential for more outreach in the future.

Policy Implications

This project was an EPA Region III effort to find out how realtors perceive radon problems. EPA should continue to pursue opportunities to look at how the general public perceives radon. EPA has a wealth of radon data but must recognize how confusing the grey areas on radon are to the non-scientist, especially during a real estate transaction. The Agency must keep sight of what the public needs to know as it continues to find new ways to communicate the risks and implications of radon. Realtors, and ultimately the general public, need solutions to practical problems.

While it is known that the potential for liability problems forces some relocation companies to require radon tests, it is impossible to know why individual buyers insist on radon tests as a condition of the agreement of sale. The State and EPA have worked since 1985 to educate the public on the risks from radon, and to encourage radon testing. Realtors themselves devised the disclosure form which brings radon tests to the attention of the

homebuying public. Two points are noteworthy: realtors devised radon disclosure forms after the State and EPA alerted the public on radon, and it appears that real estate transactions trigger many radon tests in Pennsylvania because realtors use the radon disclosure form. It is impossible to determine whether government or realtor effort has influenced the public's decision to test, but it appears that the combined efforts of EPA, the State, and realtors on the communication of radon risks, has made the test almost routine. Future policies on radon should consider this interdependence.

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9. APPENDIX

Pennsylvania Association of Realtors Radon Disclosure Forms

1. Radon Disclosure Addendum to Exclusive Right to Sell Agreement
(8/87)
2. Radon Disclosure Addendum to Agreement of Sale, and Notice to
Sellers/Buyers Regarding Radon Gas (4/89)
3. Radon Disclosure Addendum to Exclusive Right to Sell Agreement
(revised 1/90)
4. Radon Disclosure Addendum to Agreement of Sale (revised 1/90)
5. Notice to Sellers and Buyers Regarding Radon Gas (revised 1/90)

RADON DISCLOSURE ADDENDUM TO EXCLUSIVE RIGHT TO SELL AGREEMENT

RE: PROPERTY _____
AGENT: _____
OWNERS: _____

NOTICE TO SELLERS REGARDING RADON GAS

1. Radon is a radioactive gas produced naturally in the ground by the normal decay of uranium and radium. Uranium and radium are widely distributed in trace amounts in the earth's crust. Descendants of Radon gas are called Radon daughters, or Radon progeny. Several Radon daughters emit alpha radiation, which has high energy but short range.
2. Studies indicate the result of extended exposure to high levels of Radon gas/Radon daughters is an increased risk of lung cancer.
3. Radon gas originates in soil and rocks. It diffuses, as does any gas, and flows along the path of least resistance to the surface of the ground, and then to the atmosphere. Being a gas, Radon can also move into any air space, such as basements, crawl spaces and living areas.
4. If a house has a Radon problem, it can usually be cured by (a) increased ventilation and/or (b) preventing Radon entry.
5. The EPA advises corrective action if the annual average exposure to Radon daughters exceeds 0.02 working levels.
6. Further information can be secured from the DER Radon Project Office, 1100 Grosser Road, Gilbertsville, PA 19525; Call 1-800-23RADON or (215) 369-3590.

RADON CERTIFICATION

I hereby acknowledge that I have been provided with a copy of "Notice to Sellers Regarding Radon" and certify that:

- The property was tested and Radon was found to be at or below 0.02 working levels (4 picocuries/liter).
- The property was tested and Radon was found to be above 0.02 working levels (4 picocuries/liter).
- The property was modified after which it was retested and Radon was found to be at or below 0.02 working levels (4 picocuries/liter).

Seller does not warrant either the method or result of the test.

- I have no knowledge concerning the presence or absence of Radon.

I hereby authorize you, as my agent, and any subagents, to disclose the foregoing information to prospective purchasers.

AGENT _____	OWNER _____	(s)
BY _____	OWNER _____	(s)
DATE _____, 19____	OWNER _____	(s)

RADON DISCLOSURE ADDENDUM TO AGREEMENT OF SALE

19

RE: PROPERTY _____

SELLERS: _____

BUYERS: _____

DATE OF AGREEMENT _____ 19____, SETTLEMENT DATE _____ 19____, SALE PRICE \$ _____

- 1. BUYER acknowledges receipt of notice as set forth on reverse side hereof.
- 2. SELLER hereby acknowledges receipt of notice as set forth on the reverse side hereof, and certifies that:
 - () The property was tested and Radon was found to be at or below 0.02 working levels (4 picocuries/liter).
 - () The property was tested and Radon was found to be above 0.02 working levels (4 picocuries/liter).
 - () The property was modified after which it was retested and Radon was found to be at or below 0.02 working levels (4 picocuries/liter).

Seller does not warrant either the method or result of the test.

- () I have no knowledge concerning the presence or absence of Radon.

3. BUYER'S OPTION (Check only one)

- () BUYER acknowledges he has the right to have the buildings inspected to determine if Radon gas/daughters is present. BUYER waives this right and agrees to accept the property on the basis of SELLER'S certification and agrees to the release as set forth in paragraph 4 below.
- () BUYER, at BUYER'S expense, shall within _____ days from the execution of this agreement, arrange a Radon test of the residential buildings on the property.

If the inspection reveals the presence of Radon which exceeds 0.02 working levels (4 picocuries/liter), the BUYER, within five (5) days of the receipt of the report, shall furnish the SELLER with a copy of the test results. Upon receipt of the test results, the SELLER may within _____ days submit a corrective proposal, in writing, to the BUYER. Upon receipt of the corrective proposal, the BUYER shall, within five (5) days:

- a. Accept the proposal in writing, which action shall constitute a release as set forth in Paragraph 4 below; or
- b. Declare this agreement NULL and VOID, at which time all deposit monies paid on account shall be returned to the BUYER.

Should the SELLER fail to submit a corrective proposal within _____ days, then the BUYER shall within five (5) days:

- a. Accept the property in writing, which action shall constitute a release as set forth in Paragraph 4 below; or
- b. Declare this agreement NULL and VOID at which time all deposit monies paid on account shall be returned to the BUYER.

NOTE: There are various firms in Pennsylvania through which a Radon test can be arranged.

- 4. RELEASE — The BUYER hereby releases, quit claims and forever discharges SELLER, SELLER'S AGENTS, SUBAGENTS, EMPLOYEES and any OFFICER or PARTNER or any one of them and any other PERSON, FIRM or CORPORATION, who may be liable by or through them, from any and all claims, losses or demands, including personal injuries, and all of the consequences thereof, where now known or not, which may arise from the presence of Radon in any building on the property.

WITNESS _____	BUYER _____ (s)
WITNESS _____	BUYER _____ (s)
WITNESS _____	SELLER _____ (s)
AGENT _____	SELLER _____ (s)

COPIES: WHITE: SELLER, YELLOW: AGENT, PINK: BUYER, BLUE: MORTGAGES, GOLD: _____, GREEN: BUYER'S AT TIME OF SIGNING 4/89

NOTICE TO SELLERS/BUYERS REGARDING RADON GAS

1. Radon is a radioactive gas produced naturally in the ground by the normal decay of uranium and radium. Uranium and radium are widely distributed in trace amounts in the earth's crust. Descendants of Radon gas are called Radon daughters, or Radon progeny. Several Radon daughters emit alpha radiation, which has high energy but short range.
2. Studies indicate the result of extended exposure to high levels of Radon gas/Radon daughters is an increased risk of lung cancer.
3. Radon gas originates in soil and rocks. It diffuses, as does any gas, and flows along the path of least resistance to the surface of the ground, and then to the atmosphere. Being a gas, Radon can also move into any air space, such as basements, crawl spaces and permeate throughout the home.
4. If a house has a Radon problem, it can usually be cured by (a) increased ventilation and/or (b) preventing Radon entry.
5. The EPA advises corrective action if the annual average exposure to Radon daughters exceeds 0.02 working levels.
6. Further information can be secured from the DER Radon Project Office, 1100 Grosser Road, Gilbertsville, PA 19525; Call 1-800-23RADON or (215) 369-3590.

RADON DISCLOSURE ADDENDUM TO EXCLUSIVE RIGHT TO SELL AGREEMENT

19

RE: PROPERTY _____
AGENT: _____
OWNERS: _____

1. SELLER hereby acknowledges that he/she has read and understands the notice as set forth on the reverse side hereof and represents that:

- A. SELLER has no knowledge concerning the presence or absence of radon.
- B. SELLER has knowledge that the property was tested on the dates, by the methods (e.g., charcoal canister, alpha track, etc.), and with the results of all tests indicated below:

DATE	METHOD	RESULTS (picocuries/liter or working levels)
_____	_____	_____
_____	_____	_____
_____	_____	_____

SELLER DOES NOT WARRANT EITHER THE METHODS OR RESULTS OF THE TESTS.

- C. SELLER has knowledge that the property underwent radon reduction measures on the date(s) and by the method(s) indicated below:

DATE	RADON REDUCTION METHOD
_____	_____
_____	_____
_____	_____

2. SELLER is hereby advised that SELLER may be required to provide details of any testing or remediation for the presence of radon, including copies of all test reports.

3. SELLER agrees to make property available for testing during the term of this agreement.

AGENT _____	OWNER _____ (s)
BY _____ (s)	OWNER _____ (s)
DATE _____, 19____	OWNER _____ (s)

COPIES: WHITE: OWNER, YELLOW: AGENT, BLUE: _____

1/90

RADON DISCLOSURE ADDENDUM TO AGREEMENT OF SALE

_____ 19____

RE: PROPERTY _____

SELLERS: _____

BUYERS: _____

DATE OF AGREEMENT _____ 19____, SETTLEMENT DATE _____ 19____, SALE PRICE \$ _____

- 1 BUYER acknowledges that he/she has read and understands the notice as set forth on reverse side hereof.
- 2 SELLER hereby acknowledges that he/she has read and understands the notice as set forth on the reverse side hereof and represents that:
(check appropriate response(s))
 - () A. SELLER has no knowledge concerning the presence or absence of radon.
 - () B. SELLER has knowledge that the property was tested on the dates, by the methods (e.g. charcoal canister, alpha track, etc.), and with the results of all tests indicated below:

DATE	METHOD	RESULTS (picocuries/liter or working levels)
_____	_____	_____
_____	_____	_____
_____	_____	_____

COPIES OF ALL AVAILABLE TEST REPORTS will be delivered to BUYER with this addendum.
SELLER DOES NOT WARRANT EITHER THE METHODS OR RESULTS OF THE TESTS.

- () C. SELLER has knowledge that the property underwent radon reduction measures on the date(s) and by the method(s) indicated below:
- | DATE | RADON REDUCTION METHOD |
|-------|------------------------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

- 3. BUYER'S OPTION: (check only one)
 - () BUYER acknowledges that BUYER has the right to have the property inspected for radon by a certified inspector. BUYER WAIVES THIS RIGHT and agrees to accept the property on the basis of SELLER'S representation and agrees to the release as set forth in paragraph 4 below.
 - () BUYER, at BUYER'S expense, elects to obtain a certified radon test of the property and will deliver a copy of the test report to SELLER or SELLER'S AGENT within _____ days of SELLER'S acceptance of this agreement. Failure to obtain and provide radon test results by this date will constitute a WAIVER of BUYER'S right to obtain the test.

- A. If the test report reveals the presence of radon at or below 0.02 working levels (4 picocuries/liter), BUYER shall be deemed to have accepted the property and to have agreed to the release as set forth in paragraph 4 below.
- B. If the test report reveals the presence of radon which exceeds 0.02 working levels (4 picocuries/liter), SELLER may, within _____ days of receipt of the test results, submit a written, corrective proposal to BUYER. The corrective proposal will include, but not be limited to, the name of the certified mitigation company; provisions for payment; and completion date for corrective measures.

Upon receipt of the corrective proposal, BUYER, within five (5) days, will:

1. Accept the corrective proposal and the property in writing, which will constitute a release as set forth in paragraph 4 below; or
2. Declare this agreement NULL AND VOID, in which case all deposit monies paid on account will be promptly returned to BUYER.

Should SELLER fail to submit a written corrective proposal within the time set forth in paragraph 3 (B), then BUYER will, within five (5) days:

1. Accept the property in writing, which will constitute a release as set forth in paragraph 4 below; or
2. Declare this agreement NULL AND VOID, in which case all deposit monies paid on account will be promptly returned to BUYER.

If BUYER fails to exercise any of BUYER'S options within the time limit specified in this addendum, then BUYER shall be deemed to have accepted the property and to have agreed to the release as set forth in paragraph 4 below.

- 4. RELEASE — BUYER hereby releases, quit claims and forever discharges SELLER, SELLER'S AGENT, SUBAGENTS, EMPLOYEES and any OFFICER or PARTNER or any one of them and any other PERSON, FIRM or CORPORATION who may be liable by or through them, from any and all claims, losses or demands, including personal injuries, and all of the consequences thereof, where now known or not, which may arise from the presence of radon in any building on the property.

WITNESS _____	BUYER(s) _____
WITNESS _____	BUYER(s) _____
WITNESS _____	SELLER(s) _____
AGENT _____	SELLER(s) _____

COPIES: WHITE: SELLER, YELLOW: AGENT, PINK: BUYER, BLUE: MORTGAGEE, GOLD: _____, GREEN: BUYER'S AT TIME OF SIGNING 1/90

NOTICE TO SELLERS AND BUYERS REGARDING RADON GAS

1. Radon is a natural, radioactive gas that is produced in the ground by the normal decay of uranium and radium. Uranium and radium are widely distributed in trace amounts in the earth's crust. As radon gas decays, it forms radioisotopes called radon daughters or radon progeny. Radon daughters emit alpha radiation, which has high energy, but short range.
2. Studies indicate that the result of extended exposure to high levels of radon gas/radon daughters is an increased risk of lung cancer.
3. Radon gas follows the path of least resistance from the soil and rocks where it originates to the surface of the ground and, finally, to the air. Radon can find its way into any airspace, including basements and crawl spaces, and permeate throughout a home.
4. If a house has a radon problem, it usually can be cured by increased ventilation and/or by preventing radon entry.
5. The Environmental Protection Agency (EPA) advises corrective action if the annual average exposure to radon daughters exceeds 0.02 working levels (4 picocuries/liter).
6. As of July 23, 1988, any person who tests for or mitigates or safeguards a building from the presence of radon gas and radon daughters in the state of Pennsylvania must be certified by the Department of Environmental Resources (DER) of the Commonwealth of Pennsylvania, as mandated by the Radon Certification Act of 1987.
7. Any use of the word "certified" in this addendum refers to the certification mandated by the Radon Certification Act of 1987.
8. Neither the real estate broker nor the broker's agent is an expert on radon gas/radon daughters. Neither the broker nor the broker's agent warrants either the methods or results of any tests for the presence of radon gas/radon daughters.
9. Information about radon and about certified testing and mitigation firms is available through DER, Bureau of Radiation Protection, P.O. Box 2063, Harrisburg, PA 17120; 1-800-23RADON or (717) 783-3594.