

Manning the Radon Front in Pennsylvania

by Nicholas DeBenedictis



Pennsylvania has just taken what is a giant step for the Commonwealth, but a small step for a nation just becoming aware of the danger of indoor radon gas.

After testing over 22,000 homes in the last 18 months for radon and finding nearly 60 percent with high levels, the Commonwealth is now providing \$3 million in low-interest loans to help owners rid their homes of natural radioactive radon. The loan program may be just the first hurdle cleared in what is assuredly a long commitment to test and help all Pennsylvanians threatened by the risk of lung cancer from radon, but it is also the culmination of 18 months of discovery, excitement, expansion, exhaustion, and, finally, achievement in fighting a very new and hard-to-believe threat.

Radon is a colorless, odorless, tasteless gas that has been produced from the radioactive decay of trace amounts of uranium since time began. Normally, the radioactive gas dissipates into the atmosphere, where its more dangerous decay products, so-called radon daughters, pose no threat.

In today's well-weatherized homes, however, that normal process is interrupted: radon gets in, but it doesn't get out. The gas and its short-lived decay products build up, creating a greater risk of lung cancer the longer the exposure.

The lack of data on natural indoor radon and its health consequences has led most experts to rely on standards, known as working levels (WL), set for uranium miners. But these standards, which measure the level of activity of radon daughters in a liter of air, are very hard to explain to people whose homes are being endangered by a colorless, odorless, tasteless gas.

How much danger it poses is not yet known, but we in Pennsylvania have by necessity taken 0.02 WL as our action

guideline. I say by necessity because we did not choose 0.02 WL after studied consideration, but under an urgent need to take action.

Let me explain. Eighteen months ago, in December 1984, an engineer working on a nuclear power plant under construction near Philadelphia kept setting off portal monitors. He wasn't contaminated by anything at the uncompleted plant, so tests were taken of his home in nearby Berks County.

The result was unheard of—the engineer's home was 13.5 WL, 675 times our soon-to-be-developed action guideline. The week after New Year's, I had to advise Stanley Watras and his wife and two small children to leave their home immediately, minus even their newly opened Christmas presents, which were too contaminated to take with them.

They moved to a motel, and the Department of Environmental Resources moved into the neighborhood. The level of the Watras home was too high to be an anomaly, so we started testing neighbors' homes. Some had radon problems; others had none.

We suspected the problem lay with the Reading Prong, a granite rock formation stretching from eastern Pennsylvania to New England, first noted by the U.S. Department of Energy in its national search for uranium resources in the early 1970s. In fact, the Department of Energy had been funding a survey of the Prong in Pennsylvania over the last few years.

We were confronted by a problem that stretched 45 miles from Reading to the New Jersey border, was six to eight miles wide, and included over 20,000 homes in four counties.

A major radon program was obviously not part of DER's planned initiatives, but we knew we had to react immediately with as many resources as we could muster. We started with the Watras neighbors, then called a public meeting to explain radon and offer free testing. This procedure has been repeated again and again in the last year and a half as we have moved further out into the Prong.

Initially, we had no equipment, no program, nothing except our responsibility to address the problem. EPA's Radiation Laboratory from Montgomery, AL, loaned equipment and crews to help with the testing during those first crucial weeks of 1985. DOE brought in its helicopter to search for radon "hot spots" from the air.

And we tested, day after day, week after week. From the beginning, we have found that a fairly constant percentage of 50 to 60 percent of the homes surveyed have radon above .02 WL.

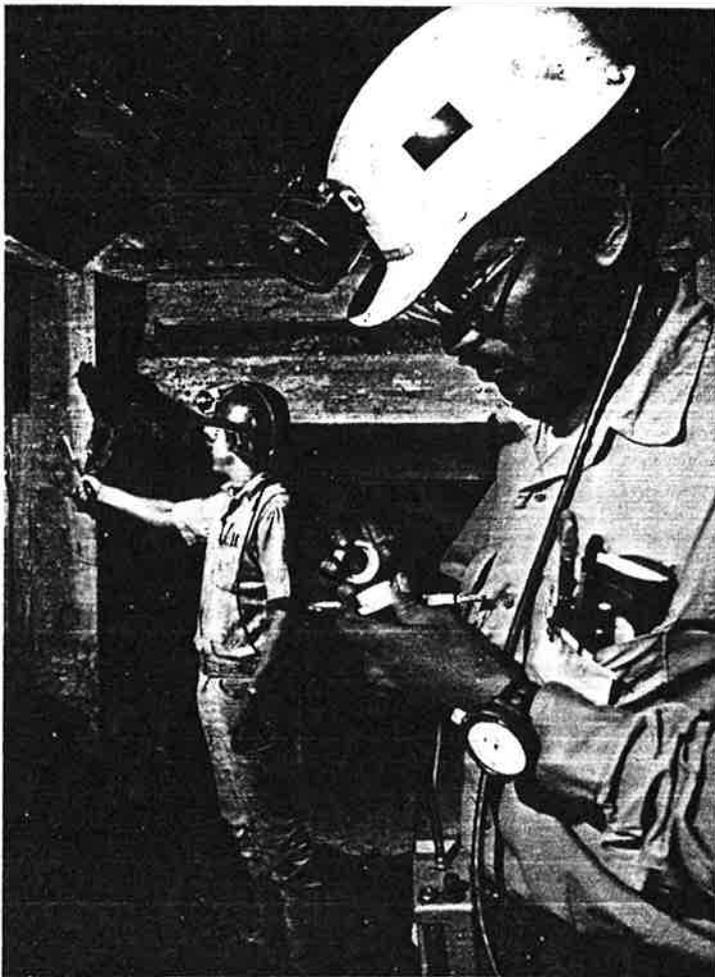
An office was established in Gilbertsville, near the Watras home, with staff from DER's Bureau of Radiation Protection. Working from the back of a dairy store, their early struggles included just getting telephones, typewriters, and finally a computer to store the test results.

Nevertheless, we were soon able to begin returning lives to normal. The Watras family, for example, was able to return home after the Philadelphia Electric Co., in cooperation with DER, had paid for remediation work by ARIX Engineers of Grand Junction, CO. This work, which cost over \$32,000, involved installing a radon barrier on exterior basement foundation walls, sealing and ventilating the interior foundation wall, sealing all floor slab openings and joints, and installing a subfloor ventilation system. Radon levels in the Watras home dropped from 13.5 WL to .009 WL.

Although levels rose again last fall, adjustments, including the addition of fans, were able to bring radon in the Watras home below .02 WL.

Bob Lewis, radiation health physicist with the Pennsylvania Department of Environmental Resources, unloads monitoring equipment from a van. A combination mobile field office and lab, the van serves as a sort of "mother ship" for field workers from the state's Bureau of Radiation Protection office in Gilbertsville, PA.

DeBenedictis is Secretary of the Pennsylvania Department of Environmental Resources.)



American Mining Congress

Workers check radon levels and ventilation in an underground mine. Estimates of the risk of lung cancer due to radon exposure are based on studies of miners.

ARIX also diagnosed 25 other radon-plagued homes for DER, and the results were collected into an advisory booklet on various building types and remedies. Residents, already unnerved by this unexpected threat, were impatient for remedies and for financial help from the government.

Our job was cut out for us when the state legislature approved \$1 million to develop a testing program for the entire Prong. We had already spent nearly \$1 million in unbudgeted money for testing, but had concentrated in southern Berks County where radon was initially found.



Jason Gaertner

Faced with offering free radon testing to over 40,000 residences in four counties, we sought a new approach. With a press conference by Governor Dick Thornburgh and full-page, repeat advertising in five newspapers and over a dozen radio stations serving the Prong we offered mail-in radon tests to residents in the four counties. The task was made no easier by a large Hispanic population in the Prong area that required translating all our radon materials into Spanish and hiring a bilingual community relations coordinator.

Over 20,000 testing requests came in, many in the immediate weeks after the Governor's announcement, which had also unveiled a \$3 million loan program to help homeowners rid their homes of radon. Whether it was the anonymity of the mail-in testing or the light at the end of the financial tunnel, over 50 percent of all those eligible for the free testing have responded.

Radon has been a most difficult issue with which to deal. At first, Pennsylvania was the only state to know much of anything, and our basic problem was trying to communicate the risks of radon gas without raising undue panic. Now, everybody seems to know about radon and the problem is why don't we, state and federal government, know more.

We welcome this dialogue, this attention, because that's how answers are found. We think Pennsylvania has contributed and will continue to contribute as more is learned about this national problem called radon. But ours is not just scientific curiosity; we feel great sympathy for the many citizens whose lives have been disturbed by this unseen threat. We feel great sympathy for the parents who worry that their children may develop lung cancer in 20 years. We feel sympathy for the young homeowners who struggle to meet a mortgage each month for a home that could cost thousands of dollars more to make safe from radon.

We do not feel helpless, however. We have acted, to the extent of our state resources and to the best of our abilities. And even though the battle is just begun, we take a moment to savor conquering that first hurdle. □