Radon: A Rising Issue at Taos Pueblo

Radon contamination at Taos Pueblo didn’t begin all that recently. In fact, it probably started over 29 million years ago, when the Rio Grande Rift began cracking the North American Plate in northern New Mexico.

In time, that cracking allowed the odorless, colorless radioactive gas to begin seeping upward to the region’s water table and ground level. For the past seven or more centuries, it has made its way into the traditional adobe structures that virtually all Taos residents have until recently called home. (In accordance with tribal customs and beliefs, the entire traditional village within the ancient walls does not have electricity or running water.)

Until recently, however, people of the Pueblo apparently did not suffer high rates of lung and other cancers or experience the aggravating effects on respiratory illnesses that radon can engender. In the 1970s, electricity first came to much of Taos Pueblo, and residents began moving out of their well ventilated adobe homes within the multi-story Pueblo and into owner-built or HUD units, which are not only well lit but have modern indoor plumbing and other conveniences.

More-efficient air seals that result from modern construction techniques have been a less-positive part of the bargain—they trap high levels of the radon that had long emanated naturally from the earth. According to Taos Pueblo Environmental Office director, Robert Gomez, only after Pueblo residents entered the modern structures did significant radon-related illnesses first begin to appear.

New Attack on an Old Problem

Gomez, along with Environmental Specialist/Radon Project Coordinator Evelyn Martinez, are overseeing a new effort in cooperation with U.S. EPA and others to address the Pueblo’s radon problem. With a $37,000 grant from EPA’s Office of Air and Radiation, the environmental staff is embarking on a program to survey homes for radon contamination and conduct education and outreach to tribal residents of all ages.

A 2000 survey conducted by the All-Indian Pueblo Environmental Council revealed that 69% of Taos Pueblo homes and buildings lie above the EPA “action level” for radon (4 Pico curies). Earlier, water-quality-related work by the U.S. Geological Survey had generated a map of fault lines in the area from which radon gas might be seeping into the water supply.

According to the Indian Health Service, Taos residents suffer an elevated incidence of a rare form of renal cancer. Gomez suggests that radon in the water supply—perhaps aggravated by modern plumbing that retains the gas in water lines—might be contributing to that problem.

Martinez suspects that high radon levels in the air inside many of Taos Pueblo’s 540 homes and approximately Taos Pueblo in northern New Mexico has been continuously occupied for at least 700 years. Only when residents began moving into modern dwellings did radon-related health problems begin to appear.
From the Associate Director

Mehrdad Khatibi
ITEP Associate Director

R elationships between tribes and states are often less than ideal—in too many cases marked by a lack of understanding, fear of turf-grabbing, a disregard for tribal sovereignty, and other vexing issues. Historically, one or both parties have been reluctant to work side-by-side on air quality issues. As a result, the advantages that might have accrued to each government have been lessened or lost.

States and tribes share many common concerns. Sources that impact reservations are often located outside tribal boundaries and are state-regulated. Title V issues impact a large number of tribes, yet tribes oversee only a fraction of Title V sources. Filling data-monitoring gaps on tribal lands can benefit both states and tribes.

Many other shared concerns exist between states and tribes, for the simple reason that air quality—and air pollution—know no boundaries.

As tribal environmental professionals have gained both technical skills and a broader understanding of the underpinnings of environmental policy, some of the old, troubled state-tribe relationships have begun to change. A few examples: In New Mexico, Zuni Pueblo is involved in an air-monitoring program partly supported by the New Mexico Environmental Department. Also in New Mexico, Taos Pueblo is working with the state to provide its residents with radon test kits, and the Navajo Nation has worked with the state on major-source permitting activities. In Arizona, the Gila River Indian Community, Salt River Pima-Maricopa Indian Community, and Fort McDowell Yavapai Nation are part of a multi-partner program involving the state of Arizona to assess, and eventually help mitigate, air toxics in Maricopa County. The Puyallup Tribe has worked cooperatively with the state of Washington on solid-waste management issues affecting non-fee land within its borders.

These kinds of working partnerships between tribes and states were rare a dozen years ago. As tribal capacity has increased, tribal air staff throughout the nation have come to speak the same language, understand complex monitoring and other technologies, and, in some cases, have surpassed states in their ability to address pollution issues. The professional equality that many tribal environmental professionals now demonstrate can’t help but break down some of the long-existing barriers between neighboring governments.

This isn’t to say that tribal-state conflicts are a thing of the past. In some states, issues of authority, trust, and respect continue to interfere with communication and diminish working relationships. In those cases, tribes must go it alone or work harder to surmount obstacles that remain a legacy of the old ways.

The ability of tribes to work with surrounding governments can make the difference between solving a shared air-quality problem or allowing it to languish. I believe that even in cases where a tribal-state relationship remains poorly developed and problematic, capacity-building will eventually help to heal the divisions. As tribal capacity grows, as more environmental problems are addressed by tribes, as tribal technicians exercise their growing professional skills and demonstrate that they stand as equals alongside their state counterparts, the walls of mistrust will gradually come down. As that happens, I believe, both sides benefit.

One issue on which the tribes and many states agree is the current proposal by U.S. EPA to loosen National Ambient Air Quality Standards for particulate pollution in rural areas. So far, EPA has received feedback from at least five states opposing the rule changes. Most tribal members live outside of cities, and many tribes have also expressed their opposition to loosening particulate standards in rural areas.

At the National Tribal Forum on April 13, tribal air professionals will have the opportunity to discuss the PM standards-change issue, express their opinion on the proposed changes, and have their opinions entered into the public record.

If you have something to say on this issue, please join us in Seattle (see page 8 for contact information).
25 government office buildings correlate with the location of Rift-related cracks in the earth. She’ll soon be employing Global Positioning System technology to map homes and offices and locate fault lines in relation to possible natural radon seepage.

A county-wide radon-mitigation program was enacted in the 1990s with the help of Rocky Mountain Youth Corp (AmeriCorps) volunteers, who installed sub-floor barriers and ventilation systems in a few Pueblo homes. That funding ran out after about 18 months. The All-Indian Pueblo Environmental Council, which provided valuable support to the tribe, ceased operations in 2000.

Taos has worked with the Jicarilla Apache Tribe’s environmental office on indoor-air issues, and they’ve talked with the Pueblo of Pojoaque about support for their radon efforts; Pojoaque air techs are certified for radon-mitigation installations, and Martinez says they’ve offered to assist the tribe with mitigation. The new EPA-funded program addresses monitoring and public education but does not include mitigation funding. Limited mitigation has been accomplished by the Pueblo in past years in fits and starts based on a series of ever-shifting resources. Recently, the Pueblo’s Housing Authority Board committed to obtaining funding to help mitigate radon contamination in Pueblo homes.

The Pueblo Environmental Office has also begun work with ITEP’s Tribal Air Monitoring Support (TAMS) Center to develop the required quality-assurance plan for their new grant-related monitoring effort.

A Simple Radon-Measurement Tool

In cooperation with the state of New Mexico Environmental Department’s Radiation Control Bureau, Taos Pueblo Radon staff are distributing short-term (3-day) radon testing kits to Pueblo residents. The simple kits, for which Martinez has rewritten the instructions to render them more-easily understandable to all residents, require nothing more than opening an envelope, setting it in a specified area for three days, then mailing it to a testing company, Air Check, which reports soon after on the results, including via the Internet. Longer-term test kits will probably be distributed to homes and offices that register the highest levels of radon contamination.

During the test-kit distribution, environmental staff are surveying residents on their smoking habits; Martinez points out that smokers in radon-contaminated environments are 15 times more susceptible to lung cancer than nonsmokers. Ongoing smoker-cessation and prevention programs by the tribe help address the dangers of cigarette smoking and its contribution to a variety of health-related problems. They’ve gained valuable public-education assistance from the nonprofit Taos Clean Air Works Coalition, particularly after pointing out to that group’s constituency the connection between smoking and long-term radon exposure.

As part of her outreach effort on radon, Martinez has presented on the radon issue to the local Taos Pueblo Headstart Parent Committee, the BIA Day School, Tribal government, and other organizations, as well as to the directors of tribal programs. She has developed an activity booklet geared toward 4th and 5th graders. The book will include word searches and coloring activities and is designed to get kids engaged in the radon-mitigation effort.

“We’ve found that kids send a good message to their parents,” she says. When we did a recent anti-smoking program, Kick Butts, we did a presentation on second-hand smoke. A couple of days later we were judging a poster competition and saw that the kids were including many of the things we taught them. They were really listening. And then we had parents come up to us and ask, ‘What are you teaching my kids?’ The Clean Air Coalition agrees that you have to reach kids first; then they tell their parents, because they care about what’s happening in their homes.”

Evelyn Martinez will be presenting the Taos Pueblo Radon program at the National Tribal Forum in Seattle Washington, April 11-13, 2006.
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ITEP–AIAQTP Training Courses for FY2006

Mar. 27–31, 2006 Air Quality Computations Flagstaff, AZ
Apr. 18–21, 2006 Envir. Radiation Mon. for Tribes Las Vegas, NV
Apr. 25–28, 2006 Basic Source Assessment/Comp. (AK) Anchorage, AK
May 1–5, 2006 Air Pollution Technology Las Vegas, NV
May 16–19, 2006 Educ. Outreach for Air Quality Prof. Flagstaff, AZ
Campus Visit Program Introduces Students to Science and University Life

Last fall, the EEOP staff was busy planning and carrying out a new Campus Visit Program. The staff has had a wonderful time introducing students from around the region to science, math, engineering, technology and the environment through hands-on, inquiry-based activities. Each session has taken place on the Northern Arizona University Campus, enabling the students to meet university faculty and staff. The students also have the opportunity to explore a university campus, which helps them prepare for their future post-secondary education.

One exciting session was the Shonto Preparatory High School Microbiology Lab experience. The EEOP staff and the Microbiology Department at NAU partnered on this unique project, which offered high school student opportunities to gain experience using a state-of-the-art university microbiology lab. Students worked with NAU faculty members Dr. Maribeth Watwood and Dr. Egbert Schwartz to extract and isolate salmon DNA. They also used high-powered microscopes to view microorganisms that help reclaim wastewater.

Students and sponsors also toured the Rio De Flag water reclamation plant. One Shonto high school student commented on the experience, “We got to look at real DNA, and I got to see what bacteria and dirt look like through a microscope. It was awesome!” Another student said, “The water treatment plant was smelly and gross, but then again really cool!”

Activities like these foster excitement and stimulate curiosity. The students came expecting to attend a lecture; they left excited and motivated to further pursue science.

Dr. Maribeth Watwood said of their enthusiasm, “These students now have a first-hand appreciation for some of the methods we use in modern microbiology and how intriguing the microbial world can be.”

Topics for the Campus Visit program have ranged from studying watersheds and their relationship to air pollution to taking a closer look at indoor air quality issues involving the decay of radioactive isotopes. Each topic is chosen for its relevancy as a community issue. The EEOP staff also conducts complementary outreach visits to the schools and works with both students and teachers.

For more information about this program, please visit www.nau.edu/eeop, e-mail us at matthew.zierenberg@nau.edu, or call Matthew at 928-523-8864.
In the early morning hours of April 26, 1986, an accident in the north of the Ukraine forever altered the world’s view on nuclear energy. The evening before, poorly trained technicians at the Chernobyl nuclear energy plant launched a safety test of the plant’s Number 4 reactor. After a series of missteps, the reactor’s safety system failed, the reactor overheated, and a huge explosion tore off its roof, scattering radioactive strontium, cesium, and other radioactive elements into the atmosphere. In the coming days, wind would carry the particles over portions of the Ukraine, Belarus, and Russia. The deadly particles would continue to be dispersed in the air for weeks, eventually leaving a trail of contamination and health impacts across Europe, Asia, Scandinavia, and beyond.

Most of the soldiers ordered to contain the radiation at the plant died within days. Over 100,000 nearby residents were evacuated, and 600,000 people for miles around took part in the initial cleanup of their surroundings. Food grown in the surrounding region continues to be a source of contamination for locals, and even for those beyond the area who unwittingly consume Chernobyl-tainted food products. Contamination is widespread in the area; radioactive hot spots range from a few inches in diameter to miles wide.

Nearby streams, including the Dnieper River, which supplies water to millions of Ukrainians, was contaminated; its bottom sludge is suffused with radioactive particles. A dead zone, approximately 18 miles in diameter around the plant, will remain uninhabitable for thousands of years. Health problems continue to plague the region; they include various cancers, decreases in IQ among children, vision problems, and other radiation-related illnesses. Estimates of illness are wide-ranging and often appear politically and economically influenced. They range from a pro-nuclear-power group’s claims that only a few dozen died as a result of Chernobyl to estimates by environmental groups that tens of thousands of people will eventually die from radiation-induced illnesses tied to the disaster.

The Long-Term Legacy of Chernobyl
Chernobyl has become synonymous with “nuclear folly.” The event not only resulted in a near-freeze on the construction of new plants around the world but also spurred a number of other, far-ranging social and political impacts. Most of Chernobyl’s effects have been disastrous, but positive lessons can be derived from the event, if only they can be learned, remembered—and acted upon.

Among those helping to ensure that the world remembers the lessons of Chernobyl is Dr. Valentina Pidlisnyuk, Director of the Sustainable Development and Ecological Education Center, located in Kiev, Ukraine. Dr. Pidlisnyuk is an advisor helping to formulate remediation policy of Chernobyl impacted lands and people.

In January, she visited Northern Arizona University (NAU) in Flagstaff, met with ITEP staff and others, and presented information to students on Chernobyl and its legacy; she also visited other educational institutions, including the University of Kansas and Haskell Indian National University in Lawrence, partners in a student foreign-exchange program. Her visits were part of efforts by the Sustainable Development and Ecological Educational Center, which, among its many efforts helps to organize student educational experiences.

This summer, ITEP student employee and NAU graduate, Nasbah Ben, will be one of many students from around the world to travel to the Ukraine in conjunc-

Dr. Valentina Pidlisnyuk and Shoshone-Bannock tribal member Dustina Abrahamson, at Kansas University.

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tion with this program. There she will meet with indigenous peoples of the region, learn about Ukrainian culture and environmental policy, and take part in roundtable discussions and other learning experiences related to the Chernobyl disaster and its far-reaching impacts.

Among the Chernobyl-related lessons that Dr. Pidlisnyuk enumerates: the plant design was flawed and, coupled with poor plant-staff training and human error, provided the basis for the catastrophe; a comprehensive disaster-contingency plan for the region was never finalized; and critically important, for several days after the disaster, local residents remained uninformed on the accident and on how they might best protect themselves.

“During the two weeks after the explosion,” she said, “there was no real news on TV, the radio, or newspapers about the danger. Only on the 15th of May did President Gorbachev announce the accident, saying, ‘It isn’t so big, and we’re doing a good job to eliminate the danger.’”

Dr. Pidlisnyuk points out that one of the few positive outcomes of Chernobyl was the energy and vitality it lent to independence efforts by citizens of the Ukraine and other former Soviet satellite states. After the disaster, environmentalist individuals and groups in the region joined with independence-minded groups to press for reform, which unuestionably aided the efforts leading to the Ukraine’s independence in 1991. The Ukraine, she adds, has developed dedicated and far-reaching ecologically oriented policies and often take the lead on European Union environmental conventions and agreements. Only a handful of plants have been built since the Chernobyl catastrophe; many more have been decommissioned. Plants like Chernobyl, utilizing light-water-cooled, graphite-moderated technology, will not likely be built in the future. And environmental groups have formed or expanded and have become much more knowledgeable on nuclear technologies and risks.

Recently, with concerns growing over the long-term viability of fossil fuels, a renewed effort is underway to encourage the construction of new nuclear plants, both in the U.S. and abroad. Even some environmental organizations are reconsidering their long-held opposition to nuclear energy, weighing its risks against the environmental degradation caused by fossil-fuel burning. As this new push for nuclear power grows in momentum, the question must continually be asked: Have we learned the lessons of Chernobyl?

Map of the spread of regional contamination around the Chernobyl accident site.

To help Indian tribes understand the science and safety issues associated with radiation-related technologies, ITEP’s American Indian Air Quality Training Program is offering a new course, "Environmental Radiation Monitoring for Tribes." The course will be useful for tribes located near national laboratories, nuclear power plants, and existing or proposed nuclear-test sites, as well as others affected by proximity to radiation-related activities. Tribal environmental professionals who simply want to learn more about radiation science and technology might also wish to attend the course.

The course, which will take place April 18–21 in Las Vegas, Nevada, will cover topics that include: basic radiation science, nuclear-energy’s impacts on tribes, radon monitoring, transportation of radioactive materials, radiation monitoring, safety training, and risk communication.

To apply for this course, e-mail Lee Anderson at Lee.Anderson@nau.edu, or call Lee at 702-784-8264.

ITEP student employee and NAU graduate Nasbah Ben, a Navajo Nation member, in Moscow Square during a 2005 trip during which she visited indigenous residents of Siberia. Her trip was sponsored by an exchange program designed to expand cultural and ecological awareness among students from around the globe.
U.S. EPA Soliciting Comments on Proposed New NAAQS Rules

On February 3, 2006, EPA provided an advance notice of proposed rulemaking (ANPR) for implementation of the National Ambient Air Quality Standards (NAAQS) for particle pollution (PM), which the Agency proposed on January 17, 2006.

The purpose of the ANPR is to assure stakeholders that EPA is aware of and is considering the multiple issues associated with implementing any revised PM fine standards, and possible new PM coarse standards that may result from the January proposal. The ANPR also announces that the Agency will seek comment on key implementation issues to ensure that stakeholder points of view are considered as EPA develops implementation plans.

In the ANPR, EPA is providing potential timelines for both the revised PM fine and PM coarse standards for designations, State Implementation Plan submittal, and attainment dates.

The ANPR recognizes that no final decision has been made concerning whether or how to revise the existing PM standards, but address various implementation issues in the event they are revised.

In the ANPR, EPA also highlights and provides preliminary thinking on how to address some of the key New Source Review issues related to the proposed new PM coarse standard and the transition from a PM_{10} to a PM coarse standard.

The ANPR solicits comments on how to best implement the transition from the current PM fine to the proposed revised PM fine standard, and from the PM_{10} standard to the proposed new PM coarse standard. It also requests comments on various issues related to revocation of the current PM fine standard as well as the existing PM_{10} standard.

EPA will take public comment for 60 days following publication of the notice in the Federal Register. Based on comments, EPA will then determine a schedule for proposal of implementation plans for the new PM standards.

The Jan 17 proposal stated that the final rule would be published in Sept 2006. Two implementation schedules would apply (one for PM_{2.5} and another for PM_{10} and PM_{2.5})—if EPA revises the PM NAAQS at that time. Comments will be accepted on this proposal until April 17, 2006.

On April 13 at the NTF conference in Seattle, tribal air professionals will have the opportunity to submit their comments directly to EPA officials and make them a part of the official record. For more information on the conference, call Naomi Yazzie at 928-523-0673.

The National Tribal Air Association has been actively involved in helping to convey to U.S. EPA officials the tribes’ responses to the proposed new rules. Their efforts include the drafting of a letter that tribes can use as a basis for their comments. For more information, visit the NTAA website at www.ntaatribalair.org.