Voices of Central Pa

Marcellus drilling transforms the state

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Photo by Hannah Abelbeck
Aaron Furgiuele, a field technician for Trout Unlimited, tests a spring that was contaminated by Marcellus drilling nearby.

By Hannah Abelbeck

As the scale and pace of Marcellus gas well drilling picks up, people in rural Pennsylvania are learning how to fight traffic jams, research deed histories, encounter the FBI, self-monitor streams and light their tap water on fire.

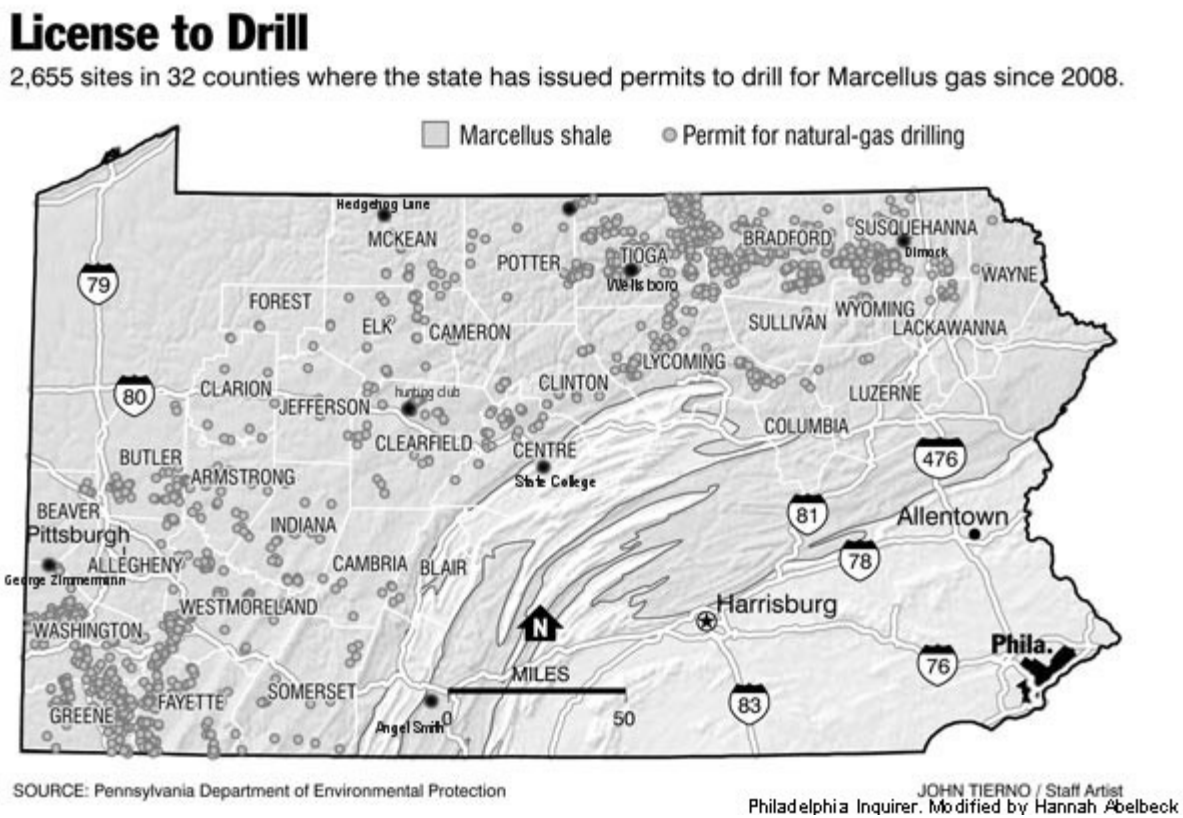
Innovations in drilling technology have fueled the rush to extract natural gas from the Marcellus shale, a geological formation that underlies 70 percent of Pennsylvania and portions of Centre County.

The gas rush is on, and money is fueling all of it. Companies and lending institutions willing to invest the big money needed up front want a fast return, resulting in quicker and more intense drilling in rural areas desperate to save their sluggish economies. Residents are signing leases, desperate to supplement sagging incomes. Workers, hungry for jobs, hope to sign up for long, dangerous work days, if they can get them. And the industry promotes the benefits and downplays the costs of massive speculation, while opposing regulations that might shrink profit margins.

Meanwhile, the environment, health, and financial well-being of Pennsylvania residents is at risk like never before.

“I don’t think anybody realizes how big and ridiculous this whole situation is,” said Dave Bailey when describing what he and his neighbors have experienced in the last two years. All of his neighbors on Hedgehog Lane, a rural street in Bradford Township, McKean County had their private water wells contaminated when one company drilled and fractured 26 non-Marcellus wells near their homes two years ago.

“I’m not opposed to domestic drilling,” said neighbor Lorrie Trumbull. “What we don’t like is shoddy workmanship.” The layer of concrete that is supposed to seal the well bore from sources of underground drinking water was not properly installed on several wells, say the neighbors.



From the Philadelphia Inquirer, modified by Hannah Abelbeck

Marcellus wells are scattered over two-thirds of Pennsylvania. The 29 wells in Centre County are concentrated in a band north and west of State College.

Two neighbors had well water with so much methane they could light it on fire. One of them was Bailey. When the water in his pipes contained 89 percent free gas, he and his family had to move into a hotel for three months to avoid an explosion. Running his washing machine still sets off his gas detectors sometimes, he said. Although he was told it was safe to shower, the two or three times they tried, members of his family had rashes and burns.

Getting the problem fixed has been an ongoing headache. After the Pa. Department of Environmental Protection found the Schreiner Oil and Gas Co. responsible, the company vented Bailey's well so that it wouldn't explode. It didn't solve the methane problem, so they drilled him a new well into the same water source. Then they had Culligan install a filtration system in his house, which did not remove the methane. In February DEP finally ordered the company to provide a permanent solution.

Bailey said the company plans to install a whole house osmosis system that uses lots of energy, takes up half his basement, and includes no

maintenance plan. From the beginning, Bailey said, the residents have requested they be connected to the municipal water system.

Water isn't the only problem. Schreiner's drilling partner, Aiello Brothers Oil and Gas, built a gas processing plant, a so-called "stripper plant" right behind their houses. Trumbull said her house has filled with gas fumes several times. Bailey said he once went through two weeks of constant gas alarms.

What really bothers the neighbors is that Aiello's New Century Pipeline Group built the plant dangerously close to their houses without a permit and in violation of zoning ordinances. The Bradford Township Zoning Hearing Board unanimously voted to deny the company's last appeal and ordered it to remove the stripping plant altogether in February. The company is appealing the decision to the McKean County Court of Supreme Pleas and continues to operate.

Photo by Hannah Abelbeck
Ken Undercoffer tests the water at Alex Branch, a tributary of Trout Run. The stream had been contaminated from Marcellus drilling nearby.

All the talk is about jobs

Much Marcellus activity is happening in rural Pennsylvania, where wages have been low and unemployment high for decades.

“People see it as an opportunity to turn the community around,” said Tim Kelsey, an economist in Penn State’s department of rural sociology. Hoping to hit it big, or at least not to lose out, residents have put in all their chips, leasing huge chunks of Pennsylvania, including more than 95 percent of Bradford County.

“These people like where they live and they want this to be a good thing,” said Matthew Filteau, a graduate student in Penn State’s rural sociology program who has interviewed hundreds of rural Pennsylvanians about the impacts of the Marcellus development. “Everybody wants this to be a good thing, regardless of whether they’re for or against it.”

The Marcellus Shale Committee, an industry group, has sponsored two studies about the economic impact of Marcellus drilling, one promising it would add $13.5 billion and almost 175,000 jobs by 2020.

Kelsey calls these projections “optimistic,” adding that the industry’s projections are based on fairly simple economic models that can predict small changes in stable communities, but not the significant changes Marcellus drilling will bring. “Economists have been AWOL on this,” he said.

Current studies do not account for economic costs, which could be substantial since many rural communities have economies based on clean air, clean water and idyllic scenery. Tourism is the second most lucrative industry in Pennsylvania. Small towns attract visitors to festivals and charming main streets. Hiking, biking, canoeing, camping and birdwatching draw visitors to nearby state forests. Hunting and fishing are not only major tourist economies in these communities but provide subsistence food for many locals. And agriculture, from corn to maple syrup and cheese, provides employment to one in five Pennsylvanians.

“Are millionaires going to milk cows?” asked Jim Weaver, Tioga County Planner. “What will this mean for our landscape?”

“The bottom line,” said Kelsey, “is that there will be significant opportunities and significant challenges. We have two years of experience in one or two communities. We don’t have enough experience yet to say with any certainty what the trends are.”

In past booms, local communities have been caught off guard by sudden growth. Expectations that revenue from resource extraction would “float all boats” were often unrealistically high, fueled by the sunny predictions of industry spokespeople. Studies of energy boomtowns in the 1980s note that “a majority of the primary stimulus will leak out through the broader regional economy as the local community is not poised to provide the labor, materials, and services needed for rapid industrialization,” wrote Jeffrey Jacquet, a Cornell University researcher, about natural gas development in rural Wyoming and its implications for the Marcellus.

The lion’s share of money flowing through these economies goes to the extraction of gas, not to the emergency services, local government or municipal infrastructure strained by the influx of workers. Furthermore, this increase can cause inflation to quadruple, said Jacquet, causing many non-gas businesses and residents to struggle.

“Twenty-one to 22 percent of our population is 60 and older, and they already have limited housing options,” said Bill Farley of the Bradford Area Agency on Aging. In the past two years, temporary workers on drilling, pipeline and seismic crews have moved into his area. “Since prices are market driven,” he said, “people at the low end of the income scale are getting squeezed out.”

Researcher Filteau is seeing it too, noting that rising rent is driving migration in rural areas, with people moving into, out of and around these communities searching for affordable housing.

Boomtown studies have revealed it is newcomers who benefit more, on average, than long-term residents, according to Jacquet. Economies based on the extraction of natural resources can actually widen the gap between the rich and the poor, as a few collect hundreds of thousands in royalties, others work for the new industry, and some struggle while their community changes around them.

It is difficult for economists to model the long-term costs associated with environmental and health costs because models are inadequate for measuring other things people value—tradition, cultural priorities, opportunities for recreation, a sense of community and history, or their quality of life.

“Economic analysis is just one piece of information,” said Kelsey, “not the definitive piece of information.”

Communities are just beginning to take account of these changes, not knowing what the outcome will be. “They came here and live here because it’s quiet and it’s rural,” said Weaver of the Tioga County residents he works for. That may soon change.

Photo by Hannah Abelbeck

Contractors are preparing to bury pipeline in Clearfield County. Pipeline infrastructure will transport gas.

The fight over rights

Mary Anne Heston of Potter County knew she didn't own the mineral rights to her land. When she and her husband bought their 98-acre wooded property in the late 1970s, there had been no drilling activity in the area for decades and gas from the Marcellus was not considered recoverable.

Thirty years later, a major natural gas pipeline runs through her township, Marcellus wells are being drilled in her county, and in some tragic throwback to railroad days, gas companies have sent "landmen" to acquire leases from her neighbors.

At the county courthouse, Heston discovered that not only had the mineral rights to her land been severed from surface rights during the Great Depression, they are now held by a national oil and gas company with a subsidiary drilling in the adjacent county. She wonders when the drilling will begin on her property.

Heston doubts she can find a buyer for her home and land whose values will decline with the gas development. "They said that when the drilling comes, there will be winners and losers," she said. "I'm one of the losers."

Approximately 1 in 10 Pennsylvanians don't own the mineral rights to their land, said Lester L. Greevy, a Williamsport lawyer who specializes in oil and gas law. In Pennsylvania, subsurface rights are dominant, and companies have "the right to come, get it, and take it away," said Greevy.

While some companies, to come across as good neighbors will negotiate with surface owners about setbacks, well pad placement and site reconstruction, under current law gas companies only have to compensate landowners if they can prove in court the company acted negligently or unreasonably. Companies can legally fell stands of trees, bulldoze hillsides, dig water reservoirs and wastewater pits, make roads, install pipelines and polka dot the land with drilling pads as large as two to fifteen acres.

Pennsylvania House Bill 1155, still in committee, could provide surface owners like Heston some small measure of protection, but its passage is hardly guaranteed. Even if Heston gets the right to negotiate, the bill still may not protect her from the worst effects of drilling.

Washington County resident George Zimmermann is suing Atlas Energy Inc. for negligence after the company drilled 10 wells on his 480-acre property. Zimmermann blames Atlas, which acquired the mineral rights from a previous owner, for the contaminated water and soil that have rendered his land, winery and heirloom-tomato business almost worthless. Atlas, which has been fined by the DEP in unrelated incidents for discharging waste onto the ground at seven other well sites, denies the allegations. "I'm fighting this because I have 250 people that work for me," said Zimmerman, who believes he has a strong case.

Drilling for gas in the Marcellus is a costly business on environmental as well as financial fronts. Methane and other gases trapped inside pores in the shale move very slowly over hundreds or thousands of years, mostly along fractures and joints in the rock. Few companies were interested in drilling because it was not "commercially viable," taking more than a decade to turn a profit.

Investors in Marcellus will benefit from combined technologies developed for similar shale in Colorado, Wyoming, Arkansas, Louisiana and especially the Barnett shale in Texas. Gas companies can drill vertically down to and then horizontally through the relatively thin layer of shale 7,000

to 11,000 feet beneath the surface. They can also use high volume hydraulic fracturing, also known as “slick water fracturing” or “fracking” for short, which involves pumping 2 to 9 million gallons of water, mixed with sand and a proprietary mixture of chemicals, some toxic, into the shale and increasing the pressure until the rock shatters and gas flows.

While investors applaud early returns, Zimmermann and others are worried about the toxins they may leave in their wake.

Photo by Elizabeth Berkowitz
A new well pad sits near a road in Lycoming county. Pads can span from two to fifteen acres each with multiple pads per mile.

Wells by the dozen

The scale and pace of Marcellus development is unprecedented.

Pennsylvania's landscape is already dotted with 350,000 active and inactive oil and gas wells, according to DEP estimates. Economic impact studies estimate the Marcellus will be developed with 8 wells per square mile over 70 percent of the 95,000 square miles of the Marcellus. That's at least 760,000 new wells. Twice as many wells may be drilled in the Marcellus in the coming decades than have been drilled in the state since the 1850s.

The first high-producing Marcellus well in the state was drilled in Washington County in 2003, and the number of new wells has increased exponentially since then. In 2008, 28 companies drilled 195 Marcellus wells, and last year, that number nearly quadrupled as 51 companies drilled 763 wells, according to figures complied by the Pennsylvania Department of Environmental Protection (DEP).

The Centre County Natural Gas Force expects development to start picking up in Centre Couny in 2010, particularly in Snowshoe and Burnside Townships.

"From working there and always hearing new things, the volume scares me, and how fast it's moving scares me," said Patty Dillman, who worked as a secretary at the DEP until her position was cut last year because of budget cuts. "Even as an employee, I didn't recognize the impact."

This year the natural gas industry expects to seek permits for 5,200 Marcellus wells and drill 1,705 of them. No one knows how much activity will be sustainable, but in the much smaller Barnett shale, approximately 10,500 wells were drilled between 2002 and 2008 in about 4,000 square miles around the Dallas–Fort Worth area.

While the Marcellus is currently being developed at one to two wells per square mile, more wells can be drilled in between if the driller can prove it necessary. And it will be. Unlike older wells in permeable gas formations which can produce gas at a steady rate for decades, gas coming out of tight shale formations like the Marcellus declines by half after the first year and slows to a trickle after the fifth.

Drillers already know that gas production from tight shale is a matter of diminishing returns.

"This unconventional gas resource is like a treadmill. We are running hard just to stay in place," said Charles Stanley, Executive Vice-President of Questar, in a 2005 speech to the Interstate Oil and Gas Compact Commission. Only more drilling or more fracturing can maintain high flows and high profits.

In similar formations in the West, companies have kept their production up by "backfilling" the land with 16 to 128 wells in a square mile. Drilling pads are connected by roads to water pits, transmission pipelines, and other drilling infrastructure. Drilling more densely, and drilling in other geological layers above and in the Trenton/Black River shale below the Marcellus could increase the number of wells dramatically.

Pennsylvania is still paying to clean up the devastation left by old resource industries lumber, steel and coal – including the largest problematic abandoned mines in the nation. While drillers are now required to seal off old wells, the DEP has flagged 8,600 abandoned wells so people don't fall in them. The agency spent millions in 2009 to plug 259 abandoned wells that were leaking natural gas, oil, and acid mine drainage into the

groundwater, surface water and air.

“My supervisor grew up in coal country,” said Dillman. “He asked me, ‘Didn’t we learn anything?’”

Waterdogs, and the FBI, are watching

After gas started bubbling up from a stream in McNett Township, Lycoming County, the Pine Creek Headwaters Protection Group started getting questions from residents worried about how drilling might impact the water that flows from the Grand Canyon of Pennsylvania through the beloved Pennsylvania Wilds.

The group had formed to address acid drainage from abandoned mining sites, but they saw a need for an educational program like the Pine Creek Waterdogs. It has already trained 87 people and is working with groups from other watersheds to start training in other counties.

“People are hungry for information,” said Tioga County planner Weaver. “People viscerally are concerned. They don’t have enough information; they don’t know what to do.”

The Waterdogs give ordinary citizens hands-on training on how become “watch dogs” over their waterways and well sites: how to document and record their observations, how to tell what observations might be significant, and who to call if they see environmental harm or public safety issues.

Elizabeth Berkowitz of Wellsboro Pa., got a visit from an FBI agent asking her information about the Pine Creek Waterdogs. “For whatever it’s worth,” she said, “he looked like an FBI agent. He didn’t look like he belonged in Wellsboro.”

A Waterdog herself, she had been running another group, Citizens Concerned About Natural Gas Drilling, and posting Waterdog meeting notices on her blog.

A Pennsylvania Oil and Gas Association spokesman had posted a story about the Waterdogs on the POGA Web site, calling them naïve and titling it “Environmental vigilante training to help enforce Marcellus drilling regs.” The FBI agent told her e-mails with the words “Waterdogs” and “vigilantes” had been circulating.

“It was out of the blue,” Berkowitz said of the visit. “But he wasn’t threatening. His name’s Dennis, and it turned out he’s a member of my rock climbing group.”

Many people who talked to Voices for this article expressed worries about speaking up—and some refused to tell their stories on record—fearing lawsuits, reprisal from companies, or ire from neighbors and coworkers. The FBI visit didn’t help this chilling effect, or the perception that government agencies are spending more time looking after the interests of the companies than protecting average citizens.

“If the FBI stops and asks around, they’ll find out we’re a legitimate, bona fide organization. Our Emergency Management Coordinator vetted our

rules and flow charts," said Weaver. As for POGA's accusations, the group apologized and took the post down. Weaver laughed and noted that the publicity wasn't necessarily a bad thing. "It stirred the pot and actually helped us out," he said.

The Waterdogs have been watching. A member of their group spotted a strange foam seeping out of the side of the canyon into Pine Creek near Waterville, Weaver said, and promptly reported it to the DEP. Airfoam HD, used in the drilling process, had been sitting sealed in the borehole of an unfinished well over the winter, and the thaw and rain in March washed it out through shallow cracks in the ground.

Water damage

Many rural Pennsylvanians are concerned about their drinking water, since 1 million private water wells provide drinking water to 3.5 million people's homes and farms. Everyone else's municipal water is influenced—if not determined—by the quality of water under ground and in rivers.

Water is an issue because of the scale of drilling and the technologies drillers will use. High volume hydraulic fracturing uses more and different chemicals than the "regular" hydrofracturing process first developed for vertical wells by Halliburton in the 1940s. Each horizontal well also requires 2 to 9 million gallons of water for fracturing, 40 to 200 times the water needed to fracture a vertical well.

This water may come from streams, ponds, lakes, rivers, or groundwater. All companies are expected to submit water management plans to the DEP. While drillers in the Delaware and Susquehanna watersheds must have additional permission to withdraw large amounts of surface water, there is no additional oversight in the Ohio watershed. DEP oversight of water withdrawals is still limited and companies are expected to self-report violations. In 2009, Trout magazine reported that four gas companies paid $1.7 million to settle charges of illegal water withdrawals from Pennsylvania trout streams. And in March, the Susquehanna River Basin Commission fined two companies who were operating without permits, while Chesapeake Energy admitted to the SRBC that it overdrew water 47 times in two counties in 2009.

Additionally, for each horizontal well, trucks will haul an estimated 10 to 30 tons of chemicals or more to the drilling site. Drilling "muds" often contain barium compounds, and hydrochloric acid is usually used to dissolve shale around the horizontal bore before fracking.

Currently, companies are not required to disclose the chemicals in the fracking mixture, but reports to a variety of federal and state agencies reveal chemicals that are hazardous to humans, animals and plants. While the industry points out that the final mixture of slick water contains a concentration of only one-half to 2 percent of these chemicals, many of them are transported to and stored on-site at much higher concentrations. Others are harmful at very small concentrations. In either case, spills on the site as well as in transit are a concern.

After the rock fractures underground, drillers decrease the pressure in the well, and the water they pumped in begins to flow back. Much of the water remains underground permanently. An estimated 30 to 70 percent of the water combined with very high amounts of gases and dissolved solids from the shale, including chlorides, heavy metals, hydrocarbons like benzene, and trace radioactive materials, returns to the surface immediately. The "produced fluids" that return would be hazardous even without the chemical additives added to make the slick water mixture.

Little of this “exploration and production waste” is regulated, even though it would be considered hazardous waste if produced by other industries. Decades of lobbying by the oil and gas industry has given them exemptions from state and federal laws that exist to protect human health and the environment—the Resource Conservation and Recovery Act, the Clean Air Act, the Comprehensive Environmental Response Compensation and Liability Act (Superfund), the Right to Know Act, and the Pennsylvania Oil and Gas Act. Most recently, then Vice President Dick Cheney, former Halliburton CEO, inserted language into the 2005 Energy Policy Act that exempted fracking from regulation under the Safe Drinking Water Act.

A number of the open pits used to collect this flowback water have leaked, so many companies are moving to closed tanks to store the initial flowback water. Some water continues to return to the surface along with the gas.

Disposing of flowback waste is a major problem for the industry, which is storing it in tanks or trucking it to West Virginia and Ohio to be injected deep into underground wells. No plant in Pennsylvania has the technology to remove totals dissolved solids (TDS), and none are capable of removing the chemical additives. As a stop-gap measure, Pennsylvania authorized some public water and industrial treatment facilities to dilute it before releasing it into waterways.

When regulations don’t work

When water from the Monongahela River began breaking residents’ dishwashers and corroding industrial machinery used by U.S. Steel and Allegheny Energy, the DEP scaled back the amount of drilling water that plants could accept. The facility in Jersey Shore was ordered to stop accepting gas drilling wastewater altogether when the DEP found it had been accepting higher volumes and more highly contaminated water than it was authorized to, and it was “not receiving or maintaining records of additives used by gas well operators.”

Clandestine dumping is widely suspected. In February, drillers in McKean County pled guilty to dumping 200,000 gallons of flowback from non-Marcellus hydrofracturing into abandoned wells at the edge of the Allegheny National Forest; they weren’t caught but were turned in anonymously. In January., the Environmental Protection Agency created its “Eyes on Drilling” phone tip line for citizens to report spills and suspicious or unusual drilling activity, a move industry leaders called “bullying.”

Treatment plants for Marcellus wastewater have been proposed all over the state, including one in Centre County whose permit is pending with the DEP Northcentral Regional Office. Other than dilution, proposed processes for Marcellus treatment, including evaporation and crystallization, and reverse osmosis are very expensive, and they concentrate the waste which still needs disposal, said Walter Ebaugh, a local hydrogeologist.

These constraints, combined with public concern over wastewater, have pushed some companies to “recycle” portions of the water for use in future fracturings by mixing it with fresh water and pumping it into the next well.

Since the volume of gas a well produces rapidly declines, only 10 percent of the natural gas in the rock can be recovered in the first few years. For vertical wells, each refracturing takes 125 percent of the volume of water needed for the first frac, according to a 2007 report by Halliburton. As a

result, in the Barnett shale, wells are often fracked three to five times, and some have been fracked more than 10 times.

The industry claims that hydraulic fracturing is safe, when things go right. The natural gas industry also claims that accidents are anomalous, statistically insignificant events that don't make drilling unsafe. But without federal oversight, there are no comprehensive data on the risks of hydraulic fracturing, regular or high volume. The Environmental Protection Agency announced March 18 that it would attempt the first in-depth scientific, peer-reviewed study of the impacts of hydraulic fracturing.

Yet there is no comprehensive underground water monitoring. There are no comprehensive data on spills. The Susquehanna River Basin Commission is just beginning to monitor its river water systematically with 30 monitoring stations.

Right now, accidents are expected to be caught by an understaffed DEP or self-reported by the industry. However, Walter Hang, president of Toxics Targeting, an environmental data firm, compiled some statistics on hazardous drilling accidents using the New York Department of Environmental Conservation's database. He found that only 22 percent of drilling incidents in New York since 1979 were caught by investigators. Instead, many were called in by residents, public safety officials, affected parties or "people who just stumbled over them." New York is under a moratorium on new drilling permits, issued in 2008, until more research is done and proper regulations and oversight are in place.

The other problem is that even if accident rates are low, the number of wells and multiple fracturings make incidents likely. Combine that with wastewater spills, well contamination, explosions, methane migration and other ecological damage related to gas production, and it can add up.

"Who decides when there's been enough cumulative impact to matter?" asked Tony Ingraffea, a Cornell professor who specializes in rock fracturing. "Until someone shows me convincing, scientific evidence that the probability of these events is so low as to be inconsequential, then I'll be convinced." He noted that for all of the attention given to hydraulic fracturing, "surface spills have the highest probability of failure.

"There's nothing inherently evil going on here," Ingraffea said. "We should slow down until we know what the problems really are."

Taking Measure

For our streams, spills are "death by a thousand cuts," says Ken Undercoffer, a resident of Clearfield County and member of Trout Unlimited. "None of them are big by themselves, but they really add up."

"These mountain streams are so acidified from acid rain they're barely able to support brook trout as it is," said Aaron Furgiuele, a Field Technician for Trout Unlimited.

Furgiuele and Undercoffer spent a rainy Sunday in March testing stream water in an area where a spill had occurred. It contaminated a spring at a hunting camp, the headwaters of a trout stream, and a tributary that flows into a public swimming area behind Parker Dam.

The contamination was discovered when a member of a hunting club stopped to take a drink from the spring which had been a reliable source for the club's drinking water for at least 50 years. The water tasted funny. His buddy had a testing device with him.

"Conductivity was through the roof," said Furgiuele. "There was something in there that shouldn't be."

The DEP's water sample had the "Marcellus footprint," said Furgiuele. "Barium, strontium, chlorides." It was traced to a drilling pad about a half mile uphill, operated by EOG Resources Inc.

There are 15 Marcellus wells in the area. Furgiuele found another contaminated stream nearby but in another watershed. Using a simple meter, he noticed unusual conductivity in a stream and followed it by choosing the more concentrated source at every branch upstream.

"I think it's a problem when someone like me is finding these things—not the companies or the DEP," he said.

These environmentalists say their work is making a difference. EOG is switching from storing flowback in open pits to a "closed-loop system" and self-reported a later spill, said Furgiuele.

Air—It's a gas

While America's Natural Gas Alliance is advertising natural gas as a "clean and abundant" energy source, it is not clean; it is "the cleanest of all fossil fuels" when it is burned, after extraction and processing. Methane production releases greenhouse gases, ozone, smog-forming particles, and other toxic chemicals into the air.

In Montana, a federal judge has just approved a settlement suspending 38,000 acres of federal oil and gas leases until their effects on climate change can be studied.

Furthermore, other fossil fuels are needed to extract the gas. The millions of gallons of water needed for fracking is often hauled in tanker trucks to the site. A study by Denton County, Texas committee estimated approximately 592 fully loaded one-way truck trips were required for the drilling, fracing, and maintenance of a well fractured with 4 million gallons of water. Larger wells could require over 1,000 truck trips, which stir up dust and release nitrous oxides, carbon monoxide, carbon dioxide, sulfur dioxide, and particulate matter into the air.

The diesel engines needed to run drilling equipment and pump water with enough pressure to fracture rock also use lots of fuel and produce significant emissions. Additionally, natural gas infrastructure, including compressors and compressor stations needed to store and transport gas also require a continual supply of fossil fuels.

The emissions add up. On summer days, rural areas of Colorado and Wyoming now have ozone levels comparable to Los Angeles. Ozone inhibits the growth of forest and agriculture by damaging leaves and damages sensitive lung tissue, making it brittle. While about 7 percent of children in

Texas aged 7 to 9 have asthma, in Barnett Shale towns almost 25 percent of the children that age have asthma, according to a study conducted by Cook Children's Health Care System.

A number of communities in Pennsylvania, most famously Dimock in Susquehanna County, have been devastated by “cumulative effects” of regular gas development, combined with negligence, violations and a few chance accidents.

“It’s been a nightmare,” said Angel Smith of Clearville, who has seen drilling foam floating in the creek, an oily residue from the compressor station coating her fields, and her groundwater contaminated with methane, arsenic, toluene and iron. “We’re afraid to even eat our own beef,” said Smith. “You lose your animals, you start losing your house, and you feel you’ve got your back against the wall.”

As Dave Bailey, the Hedgehog Lane resident with groundwater contamination and gas alarms, was telling Voices about the strain on his family life, sirens blared outside. It was the hazmat team. An employee at the plant had left a valve open, spilling 1,600 gallons of oil into the culvert behind their houses, running onto Jeff Coles’ yard, into a duck pond and a tributary.

“It’s frustrating, I guess,” Coles said. “I guess we assumed that the DEP would look out for us, and it seems like they’re not able to. The whole neighborhood isn’t against the drilling—I work at a local refinery and my livelihood depends on the drilling. We just want our clean water back.”

“If you want the neighborhood, come in and buy it,” Bailey said a few days later, “because it’s not worth anything anymore.”

Photo by Elizabeth Berkowitz

A new well pad sits near a road in Lycoming county, lighting up the valley.

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Toxic Villains & Toxic Genocide...Watch the movie, stop it!

Submitted by caws.pa on April 22, 2010 - 9:14pm.

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