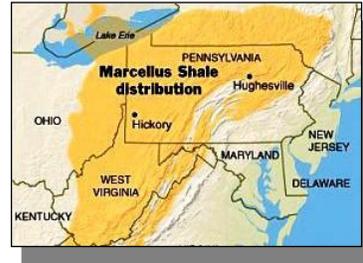




Shale Gas Roundup



A bimonthly publication of the Potter County Natural Gas Center

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Big Brother May Be Watching...

Triple Divide Watershed Coalition (TDWC) is working on a plan to install electronic devices that would constantly monitor every public drinking water source in Potter County. Purpose is threefold – to provide an early warning of contamination, to track changes in the water, and to establish a baseline that could later be used to measure deterioration. TDWC members heard an update on the project at their November meeting. Chairman John McLaughlin said state and/or federal grants may cover the costs of acquiring, installing and maintaining the remote water monitors.

In another matter, Scott Zubek from the Tioga County GIS Department discussed a digital subsurface mapping project. Potter County will eventually be included in the survey area.

Digital maps include an unprecedented level of detail about water and sewer system infrastructure, as well as groundwater location and movement. The survey will require a large amount of field work.

TDWC members repeated a call for public water supply sources to be taken into account in DEP's review of permit applications for gas drilling or other land disturbance. They also learned about a proposed amendment to the Potter County Subdivision and Land Development Ordinance would require developers to obtain consent from an affected water supplier if the development is within or adjacent to a delineated sourcewater recharge area.

Others attending were: Lou Karija, Bill Krog and Gareth Gockley, Coudersport Borough; Nate Merkel and Mat Genchur, Pa. Rural Water Assn.; Chris Mitterer and Jason Childs, Potter County Conservation District; Doug Morley and Paul Heimel, Potter County Commissioners; Mark Stephens, Pa. DEP; Betty Hilfiger and Kirsten Williams, Ulysses Borough; Susan Paisley, Rep. Martin Causer's office; Fern Burdick, Northern Tier Children's Home; Wayne D. Johnson, Driftwood Borough; Jim Clark, Penn State Extension; Laurie Barr and Les Rolfe, Save Our Streams/Pennsylvania.

Next meeting, open to the public, will be held at 9 am on Feb. 12 at the Gunzburger Building in Coudersport.



Shale Gas: Behind The Numbers



Don't be fooled by what seems like slowdown in shale gas development in the region. That's the advice of Patrick Henderson. The state's top energy official says the natural gas industry has changed in recent years, but remains strong. Henderson met with the Natural Gas Task Force for the County Commissioners Association of Pennsylvania in Hershey. Among task force members are local commissioners Paul Heimel, Potter County; Erick Coolidge, Tioga County; and Pete Smeltz, Clinton County.

Drilling began on 1,900 wells in 2011, dropped to 1,365 in 2012, and will probably come in at about 1,250 when the final 2013 figures are released. But it's misleading to draw conclusions from those statistics alone, Henderson cautioned.

'We're seeing a lot of capital spent in putting these wells into production,' he explained. "Right now, Pennsylvania has approximately 3,000 wells that are drilled and still need to be connected to pipelines." Henderson said there was a frenetic pace of well-drilling early on, because leases stipulated that wells had to be drilled to hold the land. Now, the emphasis has shifted toward building the infrastructure to get gas out to market. Until recently, gas was selling at less than \$4.00 per thousand cubic feet, compared to prices of more than \$10.00 in 2008, so companies are holding off, he noted. Underground gas storage fields are full, due in part to a mild winter of 2012-13. And while it's true that there has been a shift toward oil in terms how drilling rigs are being deployed nationally, Henderson says of those that are still drilling gas, the proportion located in Pennsylvania (15.5 percent) is higher now than in 2011. He also shared highlights of a report his office delivered to the state legislature on pipelines. Recommendations include:

- allowing public road rights-of-way to be used by for-profit companies;
- requiring line operators to register with Pa. One-Call;
- development of maps showing where all pipelines are located;
- further debate on whether Class 1 pipelines (10 or fewer households per mile) should be subject to greater state safety and structural integrity inspection.

'Crystal Ball' Shows Next Five Years

As the gas industry matures, what will the next five years hold for the Marcellus Shale region? To explore the question, the Pennsylvania Economy League recently hosted a natural gas issues forum in Lycoming County. Pennsylvania now produces 10 percent of the nation's natural gas. That gas will eventually be used in the Northeast, rather than gas running 1,800 miles in pipelines from the Gulf of Mexico to serve Northeastern markets, said panelist Donald Brominski (right) of UGI. The result is reduced cost, as well as consumers switching to gas from other energy sources. To expand rural customers' access to gas, UGI is asking the PUC for a Growth Extension Tariff Program to spread the cost burden for extensions to the customers served by the main. Industrial customers also are increasingly interested in converting to natural gas, which bodes well for domestic manufacturing and other business growth, Brominski said. Exports, vehicle conversions and cogeneration are other growth areas for natural gas.



State Forest Land: 'Heal The Scars'



(John Quigley is former Secretary of the Pa. Dept. of Conservation and Natural Resources, umbrella agency for the Bureau of Forestry. He urges a long-range strategy on the issue of state forest land gas drilling.)

Unconventional oil and gas development continues, as does the scarring of the forested landscape. But it's not the whole story – at least, not the end of it. Time will heal some of the wounds. The first rule of site restoration is to minimize disturbance in the first place. That's

where smart planning comes in.

In Pennsylvania, companies must restore the disturbed land within nine months after completion of drilling. That includes restoring the well site, removing or filling pits, and removing supplies and equipment not needed for production (unless the landowner agrees otherwise). Companies can request an extension of up to two years. State law defines restoration as “returning the portions of the site not occupied by production facilities or equipment to approximate original contours and making them capable of supporting the uses that existed prior to drilling.” Is that definition good enough?

A 2010 report by Cornell University presents this (below) as an example of a restored well site in a forested area. Is this typical? What does well site restoration really look

like? Were soils de-compacted, allowing trees to take root and grow? Was imported material used to build a flat pad removed? What was planted to reclaim the site, and what does it look like now? As DCNR Secretary, I ordered the development of best management practices for oil and gas development on state forest land. DCNR brought together lessees, environmental groups, recreation advocates, academics and others. The resulting *Guidelines for Administering Oil and Gas Activity on State Forest Lands* are among the nation's best. They encourage site-specific, ecologically based restoration. Indeed, they note that a site may be best suited to

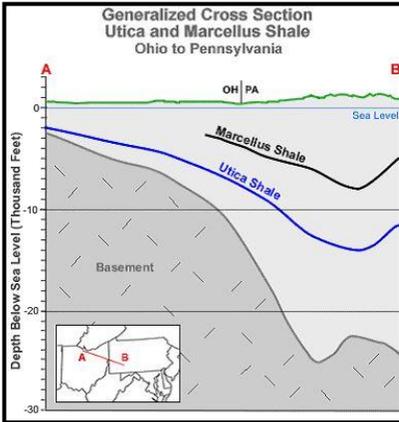
revert back to what it was originally, to fill a lacking habitat/species niche, to provide additional food sources for wildlife, or to enhance special habitats. Governor Corbett's Marcellus Shale Advisory Commission endorsed this work.

I think they're essential if Penn's Woods are to survive as we know them. What's also essential, unfortunately, is time. Even the best-restored site will look like a former drill site for a long time. Trees planted to replace those cut down when the site was cleared will need about 75 years to grow to maturity. A producing well will always be marked by tanks to hold produced water, and fencing. Gathering lines, pipelines, access roads and compressor stations will remain as long as there's gas to pump. Time will not heal all the wounds. But it can heal some – depending on what's required now. The industry's license to operate, and the Pennsylvania we leave to future generations from this latest wave of resource extraction, depend on how the land that is producing this bounty is restored. It's in the best interests of both to set the bar high.



NFG Subsidiary Seneca Resources Shares Plans

With the shale gas business being very lucrative and increasingly competitive, many companies are tight-lipped when it comes to their plans. But one of the bigger players in the region, Seneca Resources, has been a bit more forthcoming. Seneca is the



exploration arm of National Fuel Gas. The company leased drilling rights on almost 7,500 state forest land acres in Potter County in 2010 and has drilled a few wells to recoup some of its \$23.3 million investment. However, Seneca is moving slowly in the region. "Cameron, McKean and Elk counties remain the primary regions for us right now," said spokesman David Reed. "We own 100 percent of the gas in that area. I think it will be a while before drilling reaches the level we saw a few years ago, and it all comes back to the price of gas and the lack of pipelines." Seneca has also purchased oil and gas properties from EOG Resources to increase its footprint in Tioga County. The company operates more than 180 deep

shale wells in Pennsylvania. Seneca controls 745,000 acres in the Marcellus shale region in Pennsylvania and owns about 80 percent of that outright, with no royalty obligation or lease expiration.

The company is testing its holdings near Mt. Jewett for production of gas from a shale layer located below the bountiful Marcellus. Seneca officials believe the deeper Utica shale could yield profitable "wet gas" containing butane, propane and other liquids that have greater value than the drier gas (methane) produced from Marcellus shale.

Many companies have altered their business strategies due to the lagging price of dry natural gas. Wet shale gases command higher prices and have a more diverse set of uses, including applications in the petrochemical business and as additives to vehicle fuels. Seneca is also among companies exploring gas production from Upper Devonian shale, located above both the Marcellus and Utica formations.

Smaller Producers In Pa. Crying 'Foul'



Small oil and gas producers are speaking out against regulations designed to govern large-scale shale gas operations. It is the difference between wells drilled for \$50,000 and ones drilled for millions of dollars, according to former Congressman John Peterson (left), who is now an advocate for small producers. He cites an industry report finding that DEP policies "have hampered and will continue to hamper the conventional oil and gas industry, often with

unclear environmental benefit." DEP spokesman Gary Clark said that, for the most part, regulations that govern smaller producers are different from those for the state's growing shale gas industry. He allows, however, that there might be a tendency to apply the same standards. "Because the Marcellus Shale people have done such a good job, we may be holding everybody else to a higher standard," he said. "The bottom line is that DEP is duty-bound to enforce the state's laws but willing to listen to smaller producers to assure that regulations are reasonable."

Abandoned Well Inventory: Daunting Task



Oil and gas development in Pennsylvania was launched in an unregulated environment. Many drillers simply walked away from their wells once the oil and gas stopped flowing. Their legacy is tens of thousands of abandoned and orphaned wells, many of which don't show up on any maps or charts.

"Towns have been built over top of them, vegetation has covered them up, and the physical signs of wells – metal casing and pipes – have been removed by scrap collectors," laments Gene Pine, with the state Department of Environmental Protection. Pine runs the DEP division in charge of finding abandoned wells.

The best guess is that somewhere in the neighborhood of 325,000 wells have been drilled in Pennsylvania. Of those, about 120,000 have state permits on file. DEP has found roughly 9,000 abandoned and orphaned oil and gas wells.

Pine's team has a range of responsibilities. There's a full-time geologist, and a staffer charged with using mapping software to plot the location of wells. Other DEP employees coordinate contracts with the well-plugging teams hired to cement abandoned wells shut. They may fill the entire wellbore with cement. Or they may plug only portions of the well that intersect with oil and gas-bearing formations and fill the rest of the space with a gel-like substance.

The program has never been funded at a level anywhere close to the scale of its job. Things changed in 2000, when a state bond issue called "Growing Greener" passed.

The bond money added an average of \$1.1 million annually over the ensuing decade. The state plugged about as many wells in 2000 as it had in the previous decade. But Growing Greener revenue has decreased. In all, Pennsylvania's efforts have plugged fewer than 3,000 wells. Lack of funding forces DEP to focus on wells that pose the greatest danger.

"We can't plug every well. We don't have the resources, nor do we have the contractors," Pine says. "If there's no evidence a well is leaking oil or gas, and it's not near a home or body of water, then that would be given a lower priority than a well that clearly is leaking into a stream, or is near a back yard."

Pine said DEP will continue its efforts to streamline and improve its database of known wells. The department is collecting maps and other relevant documents from state and county historical organizations, as well as oil and gas drillers. The goal is to merge this data with modern digital maps.

But documentation or no documentation, Pennsylvania won't come close to finding its 200,000 lost wells for a long, long time.



(Photo above: Princeton University scientists are coming to Potter County in January 2014, where Laurie Barr and Les Rolfe from Save Our Streams will guide them to local abandoned wells. They're studying the amount of natural gas coming out of deep well formations and other potential environmental challenges presented by the thousands of abandoned and orphaned wells in Pennsylvania. Laurie is shown at left assisting at one of the well sites.)

Pa. Act 13: More Than Impact Fees



Pennsylvania's Act 13 was signed into law in February 2012. Almost two years later, many people are unaware of the law's many aspects. Potter County's Natural Gas Resource Center will address those issues during its next public meeting, "Pa. Act 13: More Than Impact Fees." Date and time will be announced. Act 13 focused on three aspects of development -- regulatory modifications, establishment of an impact fee and incentives to increase the use of natural gas vehicles:

- Counties and municipalities may not impose restrictions on oil and gas operations that are more stringent than applicable state laws – "local pre-emption" is prohibited. (This provision is subject to ongoing litigation. Commonwealth Court struck down the local pre-emption clause of Act 13 as unconstitutional, but Governor Tom Corbett has appealed that decision to the Pennsylvania Supreme Court.)
- Municipalities now have a process by which they can submit comments to DEP describing local conditions or circumstances the department should consider before issuing a permit.
- Drillers are required to provide DEP with a water management plan, which includes a water reuse plan.
- A well operator must file a record identifying depths at which methane was encountered and a descriptive list of the chemical additives (including percent by mass and volume of each chemical used), water sources, pump rates, pressures, volume and amount of recycled water used.
- Minimum setback is 500 feet from buildings or water wells, unless waived by the owner; 300 feet from any stream, spring, body of water or wetland greater than one acre identified on a map of the United States Geological Survey. DEP may grant a waiver from setback requirements if the operator submits a plan identifying acceptable measures, facilities or practices.
- Operators must restore the land surface unless consent is obtained from the surface landowner.
- Operators are considered responsible for pollution of a water supply if the affected water supply is within 2,500 feet of an unconventional well and that pollution occurred within 12 months of the later of completion, drilling, stimulation or alteration of the unconventional well.
- Unconventional well sites must be designed and constructed to prevent spills to the ground surface or off the well site.



Shale Gas Documentary On Tour



Copies of the shale gas drilling documentary, *Triple Divide*, are now available at the Coudersport Public Library. Librarian Keturah Cappadonia (left) accepted the DVDs and promotional materials from the filmmakers/journalists Melissa Troutman and Joshua Pribanic, co-founders of the investigative news non-profit Public Herald. The film is currently touring across Pennsylvania and a number of other venues. During a recent second showing at the Coudersport Theater, Pribanic said he was disappointed that Pa. Dept. of Environmental Protection officials declined to respond to the reporters' inquiries about

specific enforcement and compliance issues, including some cases in Potter County. He also emphasized the importance of property owners having their water tested prior to gas drilling so that a reliable baseline is established, and he encouraged property owners to carefully scrutinize lease offers and insist on protections that might not be found in standard lease offers. Among the incidents that are reported in *Triple Divide* (which is not connected to the local Triple Divide Watershed Coalition) is the pollution of Judy Eckert's (right) water well in Roulette, which she attributes to a nearby shale gas well.



Forbes Sees Giant Economic Ripple Effect



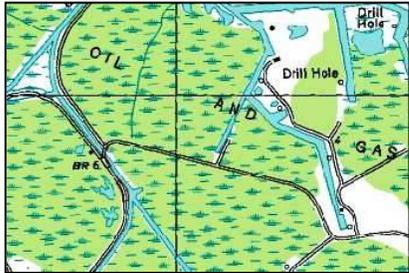
A story in the Dec. 16, 2013, edition of *Forbes* magazine examines the ripple effect that the nation's shale gas boom has on companies that service the industry. Hundreds of billions of dollars need to be spent on infrastructure to bring all the gas to market, *Forbes* points out.

"You're going to need pipelines, you're going to need storage and in some cases you're going to need the existing pipelines reversed," says Aaron Visse, who

manages the Forward Global Infrastructure Fund in San Francisco. Investors are moving toward drillers, pipeline companies, chemical companies, manufacturers that sell compressors and processing equipment, and many other related businesses.

One risk in the short term is too much supply, *Forbes* cautioned. Companies such as Chesapeake Energy that spent too much on land too far from major markets and pipelines have sold assets to survive the decline in prices. Drilling contractors are also suffering from low gas prices. Railroads, however, are emerging as clear winners. Some companies are very bullish. Williams Partners plans to spend \$3.3 billion expanding its gathering system in Pennsylvania through 2015, on top of the \$5 billion in dividend-producing assets it already has in the state. "I've worked in the Gulf of Mexico, Texas, the Rockies, and these are the biggest wells I've ever seen," marvels Ryan Savage, a Williams vice president. "This resource is so huge, it's just incredible."

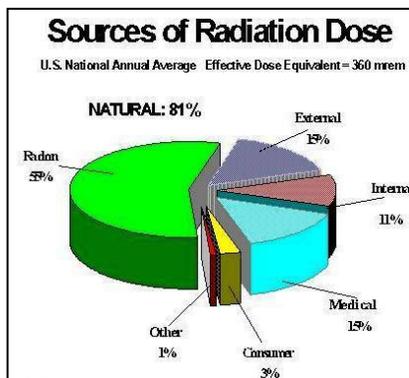
'Forced Pooling' Law In Limbo



A state environmental court has ruled that the Department of Environmental Protection must decide whether a drilling company can gather shale gas from Western Pennsylvania properties without all of the owners' consent. The decision helps clarify one of many questions about Pennsylvania's 1961 pooling law – known as the Oil and Gas Conservation Law – which is being tested for the first time since the start of modern shale gas development in the state. The

arcane 50-year-old law does not apply to the Marcellus Shale, but it applies to the deeper Utica shale. Pooling enables drilling companies to combine adjacent tracts of leased land into one unit from which they can drain oil or gas with the fewest wells. "Forced" pooling allows them to do that even if a property owner in the middle of the unit objects to signing a lease or has signed with a different company. Companies and some landowners like the idea, which they call "fair" pooling, because it allows for efficient gas extraction and pays a stake to even uncooperative parties who might otherwise leave parcels stranded or blocked. Opponents of the idea include Gov. Tom Corbett, who has called it "private eminent domain."

DEP, Industry Studying Radioactivity Issues



As previously reported in *Shale Gas Roundup*, the Pa. Dept. of Environmental Protection is conducting a study on radioactive material in drilling-related activities. Now comes word that two industry groups in Pennsylvania are planning a similar study. The Marcellus Shale Coalition (MSC) and the Pennsylvania Independent Oil and Gas Association are encouraging their members to participate in the study, according to David Spigelmyer, who was recently named MSC president. Oil and gas drilling waste can contain naturally occurring radioactive material, which can also contaminate equipment over

time or be concentrated during treatment and disposal, Spigelmyer said. The study will help the industry more fully understand and address the issue, in order to protect workers and surrounding communities. (Source: Associated Press)



This publication is produced by the Natural Gas Resource Center in Coudersport, Pennsylvania. Previous editions are available in the website, pottercountypa.net. Anyone with story ideas or comments should contact Paul Heimel (pheimel@pottercountypa.net).