

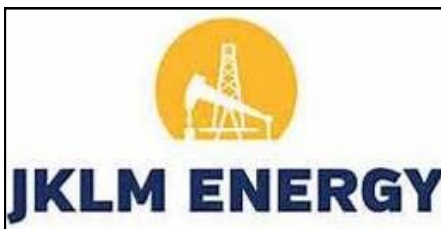
Shale Gas Roundup



Potter County, Pa.
3rd Quarter
2016

JKLM Energy moves forward in Potter Co.

While many shale gas companies have scaled back their operations across the region due to low natural gas prices and other factors, JKLM Energy is moving forward with its strategy to produce a substantial volume of gas in Potter County. By the end of 2017, depending on many factors, the company could have as many of a dozen wells drilled from pads in four locations.



Most recently, drilling began on a 13-acre tract on privately owned forest land off Pa. Rt. 44, not far from Patterson State Park in Summit Township. JKLM is also moving forward with a shale gas development in the Fox Hill area of Ulysses Township with two pads and multiple wells planned. A third JKLM development

area is located in Sweden Township off Burrows Road in the Reese Hollow area. These are in addition to the well that's currently producing gas off the Billy Lewis Road in Summit Township. Each of these wells will be drilled into Utica shale formations. There is potential for other rock strata to be drilled from the same pads in future years.

Meanwhile, JKLM has continued to monitor water sources in the area of a chemical release last September at a well site in Sweden Township. The company and Pa. Dept. of Environmental Protection (DEP) both confirm that there has been no detection of the contaminants since last October. Monitoring of water sources will continue until DEP no longer requires it.

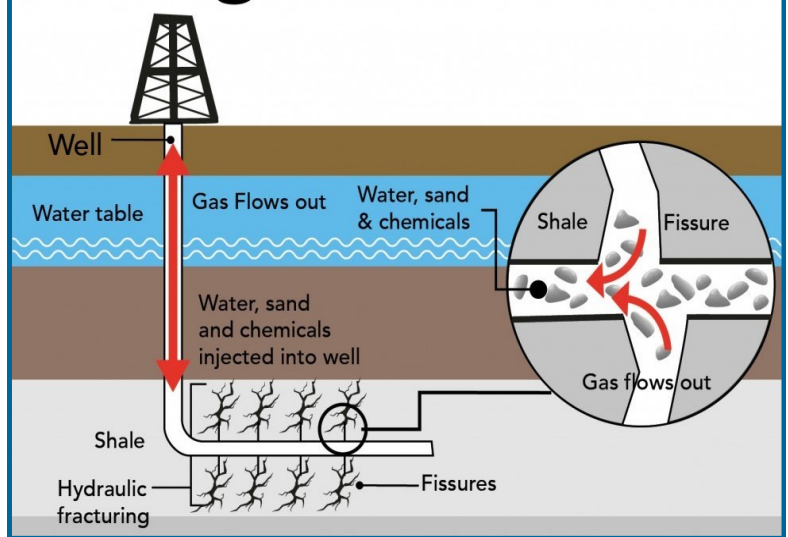
Five residences that had initially been affected by the release were equipped with water treatment systems at JKLM expense. The company provided bulk quantities of bottled water to those residences and others in the wake of the incident as monitoring continued.

Plugging of the gas well where the chemicals were released was completed in compliance with DEP standards. JKLM will eventually pay a monetary penalty to DEP as a result of the violations. The department has not revealed how that money will be used. County officials are encouraging DEP to use a portion of the settlement revenue to pay for environmental stewardship projects in Potter County.

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Shale gas extraction



This over-simplified, not-to-scale, graphic depicts the basis of a shale gas well. Companies are eyeing multiple shale gas formations at various depths in Potter and other counties as potential sources of natural gas for a growing market.

Abandoned wells pose major challenge in Pa.



Potter County's Laurie Barr has led "well walks" to locate abandoned or orphaned gas and oil wells.

Photo by Citizen Sense

Pennsylvania is grappling with a troubling legacy – thousands of abandoned gas and oil wells spread across many northern and western counties. With a shale gas revolution slowly unfolding, these pose a serious environmental risk, a logistical nightmare for drillers, and a financial burden to plug and retire.

A small but determined local citizens' group is traveling across Potter and McKean counties to find the wells and bring them to the attention of regulators. Save Our Streams/Pennsylvania, led by Laurie Barr, has been working since 2011. "These unplugged wells can act as a pathway allowing natural gas, chemicals and other fluids to contaminate groundwater, streams and forest," said Barr. "Methane, the main component of natural gas, is an especially egregious greenhouse gas which contributes to climate change."

In 1955, the state passed a law requiring operators to report the locations of their wells. By then, western and northern Pennsylvania had already been pockmarked with hundreds of thousands of wells whose locations are unknown. State regulators have investigated dozens of instances where gas has traveled through abandoned wells and reached the surface. At times, the methane has pooled into buildings and triggered explosions.

"We know they're out there," says Gene Pine, who heads the Pa. Dept. of Environmental Protection (DEP) division that's in charge of finding and plugging abandoned wells. "It's just that 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."



A house in McKean County was destroyed by a 2011 natural gas explosion. The gas migrated from a nearby well that was abandoned long ago.

Pine's team estimates 325,000 wells have been drilled in Pennsylvania. Of those, about 120,000 have state permits on file. DEP has only found about 8,500 of the others so far. That leaves upwards of 200,000 wells for which there are no records. One by one, the department is addressing the wells it knows about, inking contracts with well-plugging teams. "We don't have the resources to plug every well," Pine says. "If there's no evidence a well is leaking oil or gas, and it's not near a home or body of



Gene Pine, who heads DEP's abandoned wells unit, shows a "sucker rod" found in a well drilled long ago. When early drillers plugged wells before moving on, they tended to do it with whatever they could find.

water, then that would be given a lower priority than a well that clearly is leaking into a stream, or is near a backyard."

Laurie Barr and her colleagues are calling for a more concerted effort to address the issue. "Very few plugging projects get started each year because the programs aren't well publicized and there isn't enough money to go around," Barr said.

Shale gas 'impact fee' allotments for Potter County



Local governments now know how much money they'll get this year as a result of the "impact fee" on shale gas drilling. Potter County's allotment is \$190,209 -- down by more than \$40,000 from the 2015 figure -- as well as another \$25,000 that can be used only for certain environmental and/or recreational projects.

At the local level, top recipients are the townships of West Branch, \$59,250; Clara, \$29,540; Pleasant Valley, \$29,087; Sweden, \$28,885; Allegany, \$23,874; and Wharton, \$20,026.

Other Potter County municipal allotments are: Abbott, \$5,298; Austin, \$3,163; Bingham, \$7,016; Coudersport, \$12,617; Eulalia, \$6,379; Galeton, \$5,883; Genesee, \$5,904; Harrison, \$11,194; Hebron, \$7,223; Hector, \$7,902; Homer, \$4,119; Keating, \$17,989; Oswayo Borough, \$489; Oswayo Township, \$4,377; Pike, \$2,867; Portage, \$1,167; Roulette, \$7,279; Sharon, \$8,098; Shinglehouse, \$2,284; Stewardson, \$1,448; Summit, \$6,901; Sylvania, \$10,062; Ulysses Borough, \$1,582; and Ulysses Township, \$5,900. Amount of each allocation is based on gas production that took place in 2015.

Total impact fee payments going out to all counties and municipalities in the state add up to \$187.7 million, a significant decrease from last year's \$223.5 million.

Those figures include about \$15 million in payments to County Conservation Districts, Pa. Conservation Commission, PUC, DEP, Fish and Boat Commission, Emergency Management Agency, Dept. of Transportation and Office of State Fire Commissioner.

Under Pa. Act 13, some 60 percent of the total fees collected go to counties and local governments and 40 percent to the state. The state's portion is to be used for emergency response planning, training and other activities; water, storm water, and sewer system construction and repair; infrastructure maintenance and repair; as well as environmental initiatives.

County and local governments can use their funds for preservation and reclamation of water supplies; improvements to local roads and bridges; construction and repair of water and sewer systems; delivery of social services; local tax reduction; housing; conservation districts; emergency preparedness and flood plain management.

The 60 percent of the fees not retained by the state are distributed as follows: 36 percent to county governments with wells subject to the fee; 37 percent for host municipalities with wells subject to the fee; and 27 percent for all local governments in counties with wells.

Both the PUC and the Pa. Dept. of Environmental Protection have posted information about the Act 13 impact fee and related topics on their websites.



Six rural Potter County townships with shale gas wells are receiving substantial payments through the state's impact fee. West Branch, Clara, Pleasant Valley, Sweden, Allegany and Wharton townships will get checks totaling more than \$190,000 this year, based on last year's gas production.

Industry air emissions in DEP crosshairs

State regulators want to get better at tracking fine particulate air pollution from natural gas infrastructure, such as compressor units. Pa. Dept. of Environmental Protection (DEP) is planning a major expansion of its air quality monitoring across Pennsylvania.

DEP will spend \$1.56 million over the next five years to grow its current network of 27 monitoring sites. The department will add 10 new continuous sensors to track fine particulate matter in counties with significant shale gas development. Fine particulate matter is produced by a wide range of industrial activities. Health impacts include decreased lung function and respiratory problems, such as asthma. DEP has installed new monitors in Greene and Bradford counties. More will be set up in Lycoming, Fayette, Indiana, Susquehanna and Wyoming counties by the end of this year. Monitors will be added in McKean, Jefferson and Clarion counties by the fall of 2017.

On a related note, DEP is creating a new general permit to try to curb methane emissions from new wellpads. The agency is also drafting new regulations to curb leaks from existing sources. Those should be finalized by the end of 2017.



State regulators want to get better at tracking fine particulate air pollution from natural gas infrastructure, such as these compressor units in the Loyalsock State Forest. They're also cracking down on methane emissions.

Photo by Joe Ulrich/WITF

New state drilling regulations move forward



Governor Tom Wolf recently signed a bill that would scrap new regulations covering “conventional” gas and oil wells, while allowing new rules for shale gas wells to move forward. The new drilling rules have been in the works since lawmakers updated the state’s oil and gas law back in 2012. Governor Wolf said his action was part of a compromise with the legislature. “My administration will get to work immediately to redraft conventional regulations, and I have directed the Pa. Dept. of Environmental Protection to begin the process,” Wolf announced. That will re-start a process that had taken five years. A new council will be created to advise on conventional regulations. More than half of the committee will be industry representatives. As for the new shale gas (“unconventional”) well regulations, referred to as Chapter 78, permit applications will be subject to review by the Pa. Attorney General. Drillers will have to locate public resources such as sourcewater zones and schools. They will also have to identify old or abandoned wells that could be impacted by new drilling. If a water supply is tainted, the driller will have to restore or replace it to federal Safe Drinking Water Act standards, or the pre-drilling conditions if they were better. Shale gas drillers will also be barred from storing waste in pits, and using brine for dust suppression or de-icing.

Motor vehicles converting to natural gas

More public transit agencies and trucking contractors are turning to compressed natural gas to fuel their vehicles. Analysts forecast the trend will soon carry over to consumers. They say more vehicles will be manufactured to run on CNG. Retrofitting of cars and trucks from gasoline to natural gas will also see significant growth.

Even PennDOT is getting in on the act. The department has signed onto an \$84.5 million public/private partnership to build 29 compressed natural gas (CNG) fueling stations across Pennsylvania, including one in Warren.

PennDOT expects to save \$10 million annually in fuel costs for its vehicle fleet. “We’re also helping establish a foothold for the CNG transportation market in areas that may not have seen this opportunity for some time,” said PennDOT Secretary Leslie Richards.



CNG filling stations are popping up across Pennsylvania as fleets and personal vehicles convert. The trend is forecasted to continue.

More gas being used to generate electricity



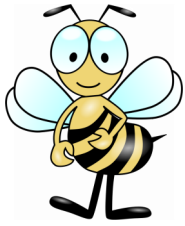
With shale gas plentiful, and more on the way, a number of utility companies are converting their generation facilities from coal to gas.

Natural gas generation surpassed coal generation on a monthly basis for the first time ever in April. Now, analysts are projecting that gas will top coal as the leading fuel for many years to come.

Energy companies are closing their coal-fired plants or retrofitting them to operate with natural gas.

Until 2008, coal supplied about 50 percent of U.S. electricity generation. By the end of 2016, the EIA predicts natural gas will generate 33 percent, with coal accounting for 32 percent. Nuclear power will

constitute 19 percent, while renewables such as solar and wind power will generate 8 percent. Hydroelectric will make up 6 percent of power generation and other sources will contribute a total of 1 percent.



Shale gas developments:

What's the buzz??

Tracking system for well site spills?

DEP is pushing for a new rule requiring well operators to report spills and leaks electronically within two hours of discovering them. That data would be linked to a tracking system available to the public online. A 2014 study found that companies called in only half of the shale well site spills that eventually led to fines. The others were discovered by inspectors or residents.



Game Commission cashes in on gas



Pennsylvania Game Commission has signed leases for shale gas development on state game lands designed to bring in \$14.6 million for the agency's budget. PGC approved a bid from Chief Exploration and Development for gas and oil rights on 5,870 acres of state game lands in Bradford and Sullivan counties. The agency gets \$2,500 per acre in a one-time bonus payment plus 20.55 percent in royalties. PGC also receives a "location fee" of \$75,000 for each well pad.

Shell game continues in Tioga County

Ever since Shell Oil's 2014 "shot heard 'round the world" touted incredible yields from Utica Shale gas drilling in Tioga County, the company has scaled back activities. Shell drilled just 10 wells in the county in 2015. "Our commitment in Tioga County remains strong," said Shell's Deborah Sawyer. "We've adapted to short-term price fluctuations while preserving long-term value."



Susquehanna River Basin okay



A report from the Susquehanna River Basin Commission concludes that shale gas drilling, which took an average of 6.7 million gallons of water per day at its peak, has had no discernable impact on water quality. In comparison, manufacturers use 8.6 million gallons daily. Parks, golf courses, ski areas and other recreational users take about 6.5 million gallons. Concerns remain about the potential impact of withdrawals on headwater streams closer to drilling sites, the SRBC said.



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