Hydraulic Fracturing and the Oil & Gas Industry

Summary

Hydraulic Fracturing, also known as “Fracking,” is a “well stimulation” process used to maximize the extraction of underground resources – oil, natural gas and geothermal energy. The hydraulic fracturing process includes the acquisition of source water, well construction, well stimulation, and waste disposal. Hydraulic fracturing involves the pressurized injection of fluids commonly made up of water and chemical additives into a geologic formation. The pressure exceeds the rock strength and the fluid opens or enlarges fractures in the rock. As the formation is fractured, a “propping agent,” such as sand or ceramic beads, is pumped into the fractures to keep them from closing as the pumping pressure is released. The fracturing fluids (water and chemical additives) are then returned back to the surface. Natural gas will flow from pores and fractures in the rock into the well for subsequent extraction.

The process of fracturing involves injecting a million gallons, or more, of water to “unlock” the gas that is trapped underground.

There are currently two schools of thought on this subject matter; the environmental views, that believe there is more harm than good that will come out of hydraulic fracturing. Environmental groups have asked federal government to regulate the practice due to harm of nearby water wells. Industry groups believe regulation should be up to individual states. The need for education and further discussion of this process and the nature of the oil and gas industry is due, in large part, to the current “fracking” of the Marcellus and Utica Shales.

The Marcellus Shale Zone - Vertical Fracturing

The Marcellus Shale is naturally occurring shale formation that extends deep underground, stretching from the southern part of New York State through Ohio, northeast West Virginia, and extending into most of Pennsylvania. The depth runs approximately 7,000 feet or more and drilling is focused on depths larger than 2,000 feet.

In order to obtain the natural gas trapped in the rock, large volumes of water are required to fracture the rock bed to release the gases. Each well (depending on whether it’s vertical or horizontal) can utilize more than one million gallons of water. The fracking fluid used contains compounds of various chemicals to make the fracturing process more effective. Compounds included:

- A friction reducer
- A biocide to prevent the growth of bacteria that would damage the well piping or clog the fractures.
- A gel agent to carry proppants into the fractures
- Various other chemical agents (methane, iodine etc.) to make sure the proppants stay in the fractures, cut through the rock efficiently, and to prevent corrosion of the pipes in the well.
Marcellus / Utica Shale
- High-Volume Hydraulic Fracturing

High volume horizontal fracturing is a process of fracking that utilizes more hydraulic fluids in the fracturing process. Different mixes of chemicals allow for the reduction in the amount of gelling agents and additive’s used, and adds in friction reducing agents. Compared to the 20,000-80,000 gallons of fluids used for vertical fracking; horizontal fracking utilizes 2 to 7.8 million gallons of fluid; depending on the length of the well bore and the number of fractures created along the well line.

Potential Positive Outcomes

Due to the industry’s high environmental impact, reports have been provided by companies such as the International Energy Agency (IEA), ITG Investment Research, IHS, and Standard and Poor’s. With a mix of both original content and summaries from scientific studies, these agencies have determined that the Marcellus Shale represents about 45% of the federal government’s estimate of total proven domestic natural gas reserves. This figure excludes New York State, as horizontal drilling is not in place in this region. The S&P indicates that natural gas production in the Northeast stood at just more than 2.0 billion cubic feet per day in 2009. S&P sees that figure rising to greater than 10 billion cubic feet in 2013, and 17 billion cubic feet by 2017.

Many of these agencies also report the following potential positive impact:

• The natural gas industry sees the trend of lower fuel prices continuing to gain traction in 2013.
• East Resources has donated money to the Susquehanna River Basin Commission to install a network of devices to remotely monitor water quality in streams near wells; alerting regulators to any serious spills or contamination.
• Horizontal drilling takes place at depths much deeper than the several hundred feet below surface, where ground water resides.
• Triple layer metal casings have been added to the horizontal fracking process to prevent any contamination into drinking water supplies.
• Independence from foreign oil suppliers.
• Potential for job creation and stability.

Environmental Impacts of Hydraulic Fracturing

• Negative impact from high volume water withdrawals, reduced stream flow, aquatic habitats, downstream wetlands, aquifers and cumulative water withdrawals.
• Risks from storm water runoff.
• Contamination risk of surface spills from fracking fluid, flow-back water and other liquid spills at the drill site.
• Groundwater impact from turbidity, fluids pumped into wells and natural gas mitigation.
• Well bore failure, leading to potential subsurface pathways.
• Insufficient waste management storage facilities and transportation.
• Impact of naturally occurring radioactive materials.
• Green house gas emissions.
• Higher road impact and increased thru traffic from load bearing trucks.
• Higher volumes of fresh water needed to source the fracturing process.
• Higher volumes of field clearing (cutting down trees) may be necessary.
Understanding Monitoring and Enforcement

Local government oversight is led by the Department of Environmental Conservation (DEC). Local governments can introduce drilling legislation, regulate local roads, and assess property taxes on gas wells. The DEC has clear mandates regarding oil and gas drilling; regulating the drilling, operation and plugging of oil and natural gas wells to ensure that activities related to these wells are conducted in accordance with statutory mandates found in the ECL.

The Department of Health monitors toxicity of chemicals, drinking water standards, and environmental setbacks. The Department of Health monitors the operation, design, and quality of public water supplies, assure water sources are adequately protected, and set standards for constructing individual water supplies. They review new proposed fracking additives, NORM issues, and assist county health departments with water well investigations and complaints.

Cost Impact State to State

As each state has different legislation and regulations; each state therefore has different cost impact. States represented in this article include: Ohio, Pennsylvania, and the Southern to Southwestern half of New York State.

Pennsylvania, while in a growth phase in the drilling industry, has seen similar disincentives to that of New York State. Pennsylvania is working to balance industry growth with environmental safety. The DEP has created Act 13 Natural Gas Vehicle Program:

- “Act 13, through the impact fee, creates a new three-year Natural Gas Energy Development Program, to be administered by the Department of Environmental Protection. Over the next three years, this program will make $20 million in grant funds available on a competitive basis to purchase or convert eligible vehicles to natural gas.” (Producers are not eligible for these grants).

- PA Senate Bill 301 imposes a “Natural Gas Fleet Vehicle Tax Credit” ([http://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?sYear=2013&sInd=0&body=H&type=B&bn=301](http://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?sYear=2013&sInd=0&body=H&type=B&bn=301)). This credit enables an entity doing business in the Commonwealth of PA, which owns five or more vehicles and which is subject to tax under Article III, IV, or VI, a tax credit. The entity has to comply with the “Natural Gas Fleet Vehicle Conversion Plan”, which dedicates 90% compressed natural gas fuel, or liquefied natural gas, and 10% or less on gasoline or diesel. Eligibility applies if a comprehensive natural gas conversion plan of fleet vehicles takes place within four years of the start date and has financial viability.
Conversely, a Pugh Clause has been imposed for oil and gas leases. The Pugh Clause states: “Without a Pugh Clause, if a lease covers 500 acres and the oil/gas drilling company put only 50 acres in a pooled unit for producing wells, the lease would remain in effect as to the other 450 acres not being used as well as the 50 acres in use. With a Pugh Clause, the 450 acres would be available to lease to another company.”

Ohio is a key state in industry growth. The state of Ohio has allowed for all conventional wells that produce less than 10 mcf a day, based on quarterly production, to be exempt from all gas severance tax. Along with this, Ohio has created a Local Impact Assistance Program:

- Prior to drilling, producers will pay local governments roughly $25,000 per horizontal well to address local needs such as infrastructure enhancements, health and safety. Producers will be reimbursed up to $25,000 per well over time from the well’s real estate tax payments.

- Current tax rates stand at $0.03 per/mcf; proposed Ohio changes would include 1% of gas value for horizontal wells and 1% with a cap at $0.03 per/mcf for conventional wells.

- Ohio has also added an Income Tax Reduction Fund; taking into consideration regulatory costs and tax revenue under current tax structure.

Please see [http://oilandgas.ohiodnr.gov/portals/oilgas/pdf/OilGasTaxV5.3-FINAL.pdf](http://oilandgas.ohiodnr.gov/portals/oilgas/pdf/OilGasTaxV5.3-FINAL.pdf) for further information.

New York State allows for compressed natural gas, and hydrogen fuel that is used exclusively to operate a motor vehicle engine to be considered for exemption from state sales and use taxes. Additionally, New York cities and counties may reduce the sales and use tax imposed on 20% biodiesel blends (B20) to 80% of the diesel fuel tax rate. The exemption and rate reduction are in effect until September 1, 2014.

Further information and allowances for New York State will be determined once the Geisinger Health System study, launched in Pennsylvania by Degenstein Foundation, is finished. Until such time as the study is complete, NYS has some basic credits through the NYS Energy and Research Development Authority (NYSERDA). The incentives are geared towards alternative fuel trucks; some of which are used for natural gas corporations.

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Freed Maxick is leading the way in help companies navigate state by state tax filing requirements in the oil and gas industry; whether in oil and gas investments or directly with drilling companies. Our professional can assist at the entity and investor level to ensure deductions are maximized.

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