

Get The Facts on Hydraulic Fracturing

Q: What is hydraulic fracturing? Why is it important?

A: Hydraulic fracturing is a technology used to stimulate the flow of energy from new and existing oil and gas wells. By creating or even restoring millimeter-thick fissures, the surface area of a formation exposed to the borehole increases and the fracture provides a conductive path that connects the reservoir to the well. These new paths increase the rate that fluids can be produced from the reservoir formations, in some cases by many hundreds of percent.

Hydraulic fracturing is an environmentally responsible way to make the most of our American energy resources, while limiting disturbance to land. Without it, wells that would have run dry years ago, or that never would have been productive in the first place, are made viable. Experts believe 60 to 80 percent of all wells drilled in the United States in the next ten years will require fracturing to remain in operation.

That's especially true in and around our nation's "shale plays" – areas across the United States that hold hundreds of trillions of cubic feet of natural gas, but would be too deep, too hard, and too expensive to access were it not for hydraulic fracturing.

The Marcellus Shale Play

The Marcellus Shale is one of the largest natural gas fields in North America, and its scope is expanding. It has the potential to generate a multibillion-dollar direct impact on the economy, with multiplier effects rippling through virtually all regional industries.

In 2002, a U.S. Geological Survey estimated that the Marcellus Shale formation held 30.7 trillion cubic feet (tcf) of natural gas – a colossal amount for the U.S. considering that the U.S. consumes about 23 tcf of natural gas per year, but only produces about 19 tcf.

But according to a recent study, which takes into account the technological advances made in the industry from 2002 to the present, the Marcellus formation could hold a volume up as high as 500 tcf – more than 16 times the old estimate.



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Q: Is the technology safe? Is it regulated? What chemicals are involved in the process?

A: Hydraulic fracturing is a safe, well-regulated, environmentally sound practice that, according to the Independent Petroleum Association of America (IPAA), has been employed over one million times without a single incidence of drinking water contamination. Hydraulic fracturing's record of safety and impressive ability to help make the most of our domestic energy resources designate it as one of the most important tools in our nation's effort to achieve energy independence.

Every step of the process – from the initial boring of the well to its sealing after it has run dry – is conducted in accordance with state requirements. Indeed before a well is even drilled, it requires approval by state officials and a Permit-to-Drill.

Fracturing fluid is the most important component in the hydraulic fracturing process. Water and sand constitutes more than 99.5 percent of the solution. The remaining .5 percent of the solution contains three primary additives: a friction reducer, similar to canola oil, which thickens the fluid, and a bactericide, like chlorine, which is used the same way chlorine is used in our drinking water. The fluid also contains a 0.1 percent portion of a micro emulsion element similar to those found in personal care products, such as shampoos, and cutting oils.

Hydraulic Fracturing -- Regulatory Framework

Natural gas is one of the cleanest, most abundant and affordable fuels available today. The development of natural gas, including gas from deep shale formations, such as the Marcellus, is regulated under a stringent system of federal, state and local laws that address every aspect of the natural gas industry's operations.

Federal

The U.S. Environmental Protection Agency (EPA) administers federal environmental laws, either directly or by delegating authority to the states. In addition, all natural gas exploration and operations on federally owned land are managed by the Bureau of Land Management (part of the Department of the Interior) and the U.S. Forest Service (part of the U.S. Department of Agriculture).

It must also be noted that at least one regulatory or administrative agency permits and regulates operations (including their design, location, spacing, operation, production rate and abandonment/closure) for each state in which oil and gas is produced. Their oversight covers environmental activities, including (but not limited to) water management, waste management and disposal, air emissions, underground injection, wildlife impacts, surface disturbance, and worker health and safety.



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New York State

Here in New York, hydraulic fracturing has been used for decades. There have been 75,000 wells drilled in New York since the very first natural gas well was dug here in 1821. Approximately 14,000 of these are still active and have had an excellent track record on environmental compliance and safety standards.

In 1963, the state's oil and gas regulatory program was established and has been through two substantial revisions – the first in 1981 and the second as recently as 2005. Since that time, the program has effectively protected New York's ground water and drinking water sources. This has been accomplished through the administration of this comprehensive program by the State's Department of Environmental Conservation (DEC) through a permitting program and regulations that mitigate, to the greatest extent possible, any potential environmental impact of drilling and well operation.

To protect the environment during and after oil and gas extraction, DEC imposes strict drilling permit requirements that inhibit oil spills, prevent ground water contamination and require proper disposal for all wastes and proper containment of drilling and fracing fluids. Drilling permits also protect groundwater by mandating a casing and cementing program for each well, which prevents the flow of oil, gas or salt water between underground formations. Drilling rules and regulations require setbacks from municipal water wells, surface water bodies and streams.

Further, the DEC reviews all oil and gas drilling permits in accordance with the State Environmental Quality Review Act (SEQR) to ensure that the environmental impact of resource extraction will be mitigated to the greatest extent possible. The end result is effective oversight of hydraulic fracturing and ample protection of the state's ground water and drinking water sources.

As applied to the oil and gas industry, the Clean Water Act regulates surface discharges association with drilling and production and storm water runoff from production sites to certain waters.

The Underground Injection Control program of the Safe Drinking Water Act regulates the underground injection of wastes from all industries including the oil and gas industry. Likewise, the Clean Air Act limits air emissions from engines, gas processing equipment, and other sources associated with drilling and production.



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Q: How was hydraulic fracturing able to secure an exemption to regulation under the Safe Drinking Water Act?

Q: Isn't it true that the oil and gas industry is the only industry in America to have been given this exemption?

A: Hydraulic fracturing was never regulated under the Safe Drinking Water Act – and, by that definition, could never have been granted an “exemption” from it.

In 2005, Congress passed (with the vote of then-Sen. Barack Obama) the Energy Policy Act, a key provision of which sought to clarify Congress’s historical intent on whether the Safe Drinking Water Act (SDWA) of 1974 was ever designed to regulate hydraulic fracturing.

The answer was no, and in this case, history proved an effective guide: When SDWA was passed in 1974, hydraulic fracturing had already been in use for 25 years. Hydraulic fracturing was never considered for inclusion under SDWA jurisdiction at the time. The Act was amended in 1980, and then again in 1986 and 1996. At no point in the process was the concept of SDWA regulation over fracturing ever considered a necessity – or even a possibility.

A: First, no “exemption” was granted. Second, it’s important to understand the activities the Safe Drinking Water Act was implemented to regulate. Specifically as it relates to the law’s Underground Injection Control (UIC) program, the program’s chief objective is to properly manage the disposal of hazardous wastes for the purposes of permanent storage. But that’s neither the purpose nor practical effect of hydraulic fracturing. Its purpose is to help facilitate the delivery of a resource from underneath the ground to above it, not the other way around.

To be clear, hydraulic fracturing is fundamentally different than the underground injection activities regulated under the Safe Drinking Water Act, which is why hydraulic fracturing was never intended to be regulated under the Act in the first place.

Even still, the oil and gas industry is subject to a wide range of regulatory requirements under a variety of different federal environmental statute, including elements of the Safe Drinking Water Act, the Clean Water Act, the Clean Air Act and the Emergency Planning and Community Right-to-Know Act. In certain cases the law does allow for other federal and/or state laws/regulations to oversee particular activities when appropriate.

For New York in particular, this is a plus. New York has some of the most rigorous regulatory requirements in the country, which have quite literally shaped the oil and natural gas industry here.



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Q: Are states really equipped with the resources and expertise that are needed to safely regulate this process?

A: Since hydraulic fracturing became a commercially viable practice 60 years ago, state agencies have effectively monitored its implementation, setting guidelines and best practices. Each state in which hydraulic fracturing is used has a team of highly qualified inspectors and scientists whose job is to guarantee the proper execution of oil and natural gas extraction.

Here in New York, every step of the process – from the initial boring of the well to its sealing after it has run dry – is conducted in accordance with strict state requirements.

The Ground Water Protection Council (GWPC), considered “one of the nation’s leading groundwater protection organizations,” released a report in May underscoring this record of safety and performance on the state level, finding the “current state regulation of oil and gas activities is environmentally proactive and preventive.”

GWPC additionally found that the “regulation of oil and gas field activities is managed best at the state level where regional and local conditions are understood and where regulations can be tailored to fit the needs of the local environment.”

Well operators not only work with state regulators, but also comply with numerous federal requirements. The Occupational Safety and Health Administration, the Environmental Response, Compensation and Liability Act and the Toxic Substances Control Act all contain record keeping and reporting rules followed by energy producers. These regulations ensure all chemicals used in the extraction process are properly handled and stored, and that workers and first responders are made aware of the substances they handle.



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Q: How can states effectively regulate hydraulic fracturing if they have no idea what's in fracturing fluids?

Q: How do you respond to reports suggesting more than 1,000 separate cases of drinking water contamination have been tied to HF?

A: They do know. Not only are regulators apprised of the universe of materials used in fracturing operations in their state, but emergency response personnel also have access to that information as well. In New York, all additives are currently disclosed to the Department of Conservation (DEC).

Some states, such as Pennsylvania, have even decided to post those materials on public agency websites. (<http://www.dep.state.pa.us/dep/deputate/minres/oilgas/FractListing.pdf>)

This might be something New York considers when the time comes.

As you will see from this web site, benzene and toluene are not used in fracturing operations.

A: Not a single documented case of drinking water contamination has ever been credibly tied to hydraulic fracturing. Not one. In 60 years.

From where does that "1,000 cases" figure arise? Last year, 452,000 wells produced natural gas in the United States. Opponents of hydraulic fracturing have asked state regulators to produce lists of each individual case in which a well was breached or any amount of methane compromised the integrity of the well. That none of these cases had anything to do with hydraulic fracturing is rarely mentioned.

In 2004, no less an authority than EPA itself undertook an exhaustive project of research and analysis aimed at finding out, once and for all, whether hydraulic fracturing posed a legitimate risk to ground and drinking water. It found "no evidence" of any such risk.



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Q: What constitutes “contamination”? Isn’t it enough that wells have exploded, faucets have gone flammable, and methane has gotten into drinking water?

Q: Has any rigorous study taken place on whether hydraulic fracturing is a threat to human health?



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A: Hydraulic fracturing contamination of drinking water is defined as the existence of fracturing-related fluids in a drinking water supply, found to reside there in sufficient quantities pursuant to activities directly related to hydraulic fracturing. To date, there have been no documented cases that credibly tie hydraulic fracturing to drinking water contamination.

Hydraulic fracturing related contamination would result if the hydraulic fracturing stimulation is the sole cause of the well integrity to fail. In cases where states have investigated complaints suggesting that contamination is the result of hydraulic fracturing, they look for compounds from the fracturing fluids. If they don’t find them, then the source of the problem is elsewhere. A good example is testing for potassium chloride (KCL) that is used for many fracturing jobs and is not otherwise present in producing wells.

932,000 separate wells produce natural gas in the United States. Virtually all are managed in a way that ensures the integrity of the operation remains intact. But when leaks occur, or pressure from the rising natural gas forces an unplanned disruption to take place, it’s not adequate to simply assume hydraulic fracturing was the cause – even though none of the tracer frac fluids were located in the reservoir.

A: Studies conducted by respected authorities have all concluded that hydraulic fracturing is safe. The Environmental Protection Agency (EPA), Ground Water Protection Council (GWPC) and the Interstate Oil and Gas Compact Commission (IOGCC) have all found hydraulic fracturing to be non-threatening to the environment, our ecosystems or public health.

The GWPC survey of state energy regulatory agencies found no documented cases of contaminated drinking water linked to hydraulic fracturing. GWPC also concluded – in two separate reports released more than a decade apart – that state regulations were sufficient to ensure the integrity of the water supply.

A 2002 study conducted by the IOGCC – a multi-state government agency that represents 37 governors – confirmed the GWPC’s conclusion that no evidence of contaminated drinking water due to hydraulic fracturing could be found.

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Q: Has any rigorous study taken place on whether hydraulic fracturing is a threat to human health?

In 2004, the EPA conducted an extensive survey of hydraulic fracturing practices and their effect on drinking water. Focusing on the shallowest of wells (those that have the highest potential of harming the water supply), the EPA found that several factors (fluid recovery, the small amount of chemicals contained in frac fluids, their dilution in water and their absorption by rock formations) minimize the potential risks associated with hydraulic fracturing.

More specifically, the EPA concluded that no hazardous chemicals were found in fracturing fluids, and that hydraulic fracturing does not create pathways for fluids to travel between rock formations to affect the water supply.



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