



Connection between water and hydraulic fracturing



Energy supply, regulation and job growth



Illinois Hydraulic Fracturing Regulatory Act



Insight

Hydraulic Fracturing

While oil drilling in Illinois has died down in the past couple of decades, exploration for and production of shale gas, trapped in rock formations thousands of feet underground, has risen as a new method of extraction. Hydraulic fracturing, also known as fracking, like all mining is both a state issue and a local issue impacting energy security, community development, environmental quality and regional economies. As gas drilling heats up in Illinois, there is still much discussion to be had on the role of local government in the process.

Illinois' process for determining the role of state agencies in regulation of hydraulic fracturing is well underway and appears to be moving towards creating the nation's most restrictive rules. As a result of agreements reached between industry, agriculture, environmentalists, and the Attorney General, the legislature has the opportunity to pass a fracking bill,

one that balances economic development with environmental protection.

Counties and cities throughout Illinois have taken diverse positions on fracking. Adherence to local zoning and land use regulations is one area of debate. Other concerns include environmental risk such as water treatment and recycling, ground impaction, increased traffic and road

damage, storm water disposal, flood hazards and hazmat issues regarding transportation of toxic chemicals. Fees to funnel money back to localities to deal with impacts may be one solution.

Regardless, hydraulic fracturing is coming to Illinois. Southern Illinois in particular, might see one of the biggest oil and gas booms in its history.



U.S. EPA Fracking Study

The U.S. Environmental Protection Agency (EPA) provided an update on its ongoing national study currently underway to better understand any potential impacts of hydraulic fracturing on drinking water resources.

Results of the study, which Congress requested EPA to complete, are expected to be released in a draft for public and peer review in 2014. The update provided on December 21, 2012 outlines work currently underway, including the status of research projects that will inform the final study. While this progress report outlines the framework for the final study, it does not draw conclusions about the potential impacts of hydraulic fracturing on drinking water resources, which will be made in the final study.

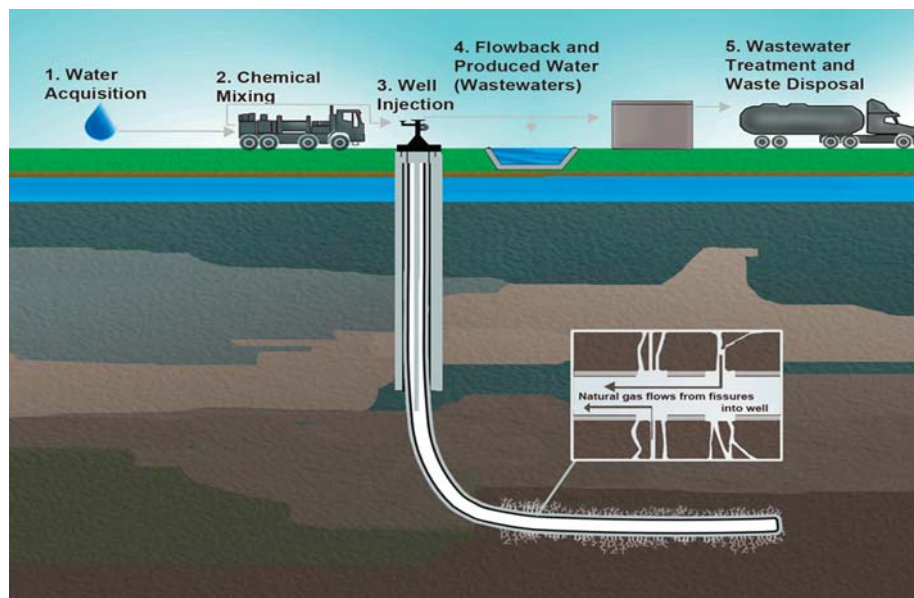
As the administration and EPA has made clear, natural gas has a central role to play in our energy future, and this important domestic fuel source has extensive economic, energy security, and environmental benefits. The study EPA is currently undertaking is part of EPA's focus to ensure that the Administration continues to work to expand production of this important domestic resource safely and responsibly.

Among the information released are updates on 18 research projects and details on the agency's research approach as well as next steps for these ongoing projects and analyses. EPA has engaged stakeholders, including industry, to ensure that the study reflects current practices in hydraulic fracturing. EPA continues to request data and information from the public and stakeholders and has put out a formal request for information which can be accessed through the federal register.

The study has been designated a Highly Influential Scientific Assessment, meaning it will receive the highest level of peer review in accordance with EPA's peer review handbook before it is finalized.

More at www.epa.gov/hfstudy.

The most significant and visible issue in the fracking debate is the composition, management and disposal of hydraulic fracturing fluid or wastewater.



Water is needed during the hydraulic fracturing process, and it is a central component of the waste products. Potential impacts to drinking water supplies have been suggested from many recent reports. Fracturing fluids can be up to 99% water. The volume of water needed for hydraulic fracturing varies by site and type of formation. Fifty thousand to 350,000 gallons of water may be required to fracture one well in a coalbed formation while two to five million gallons of water may be necessary to fracture one horizontal well in a shale formation. Water used for fracturing fluids is acquired from surface water or groundwater in the local area.

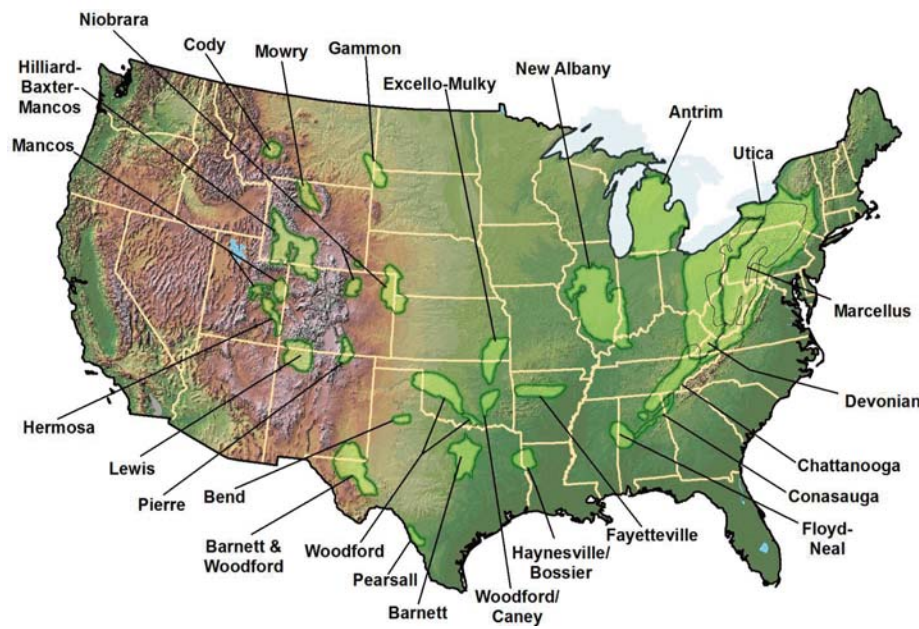
Wastewaters from the hydraulic fracturing process may be disposed in several ways. For example, the flowback water following fracturing may be returned underground using a permitted underground injection well, discharged to surface waters after treatment to remove contaminants, or applied to land surfaces. Not all fracturing fluids injected into the geologic formation during hydraulic fracturing are recovered. Estimates of the fluids recovered range from 15-80% of the volume injected depending on the site. Some companies reuse flowback to hydraulically fracture more than one well as a way of conserving water and recycling the fluids.

Public concerns have focused recently on the impacts of the hydraulic fracturing process used during natural gas production from shale and coalbed methane formations. Potential risks to surface and underground sources of drinking water might occur at various points in the hydraulic fracturing process. The likelihood of those risks causing drinking water contamination will be evaluated during the EPA hydraulic fracturing study. Contaminants of concern to drinking water include fracturing fluid chemicals and degradation products and naturally occurring materials in the geologic formation (e.g. metals, radionuclides) that are mobilized and brought to the surface during the hydraulic fracturing process.

Source: U.S. Environmental Protection Agency Office of Research and Development

THIS PUBLICATION IS A RESEARCH TOOL AND NOT THE COUNSEL OF AN ATTORNEY. THIS PUBLICATION IS NOT A SUBSTITUTE FOR THE ADVICE OF AN ATTORNEY. It is provided without warranty of any kind and, as with any research tool, should be double checked against relevant statutes, cited sources, case law, attorney general opinions and advice of legal counsel.

Shale gas development in the United States



Shale gas is present across much of the lower 48 States. The above exhibit shows the approximate locations of current producing gas shales and prospective shales. The most active shales to date are the Barnett Shale, the Haynesville/Bossier Shale, the Antrim Shale, the Fayetteville Shale, the Marcellus Shale, and the New Albany Shale. Each of these gas shale basins is different and each has a unique set of exploration criteria and operational challenges.

A series of federal laws governs most environmental aspects of shale gas development. For example, the Clean Water Act regulates surface discharges of water associated with shale gas drilling and production, as well as storm water runoff from production sites. The Safe Drinking Water Act regulates the underground injection of fluids from shale gas activities. The Clean Air Act limits air emissions from engines, gas processing equipment, and other sources associated with drilling and production. The National Environmental Policy Act (NEPA) requires that exploration and production on federal lands be thoroughly analyzed for environmental impacts. Most of these federal laws have provisions for granting "primacy" to the states (i.e., state agencies implement the programs with federal oversight).

State agencies not only implement and enforce federal laws; they also have their own sets of state laws to administer. The states have broad powers to regulate, permit, and enforce all shale gas development activities – the drilling and fracture of the well, production operations, management and disposal of wastes, and abandonment and plugging of the well. State regulation of the environmental practices related to shale gas development, usually with federal oversight, can more effectively address the regional and state-specific character of the activities, compared to one-size-fits-all regulation at the federal level. Some of these specific factors include: geology, hydrology, climate, topography, industry characteristics, development history, state legal structures, population density, and local economics. State laws often add additional levels of environmental protection and requirements. Also, several states have their own versions of the federal NEPA law, requiring environmental assessments and reviews at the state level and extending those reviews beyond federal lands to state and private lands.

Hydraulic fracturing has been a key technology in making shale gas an affordable addition to the Nation's energy supply, and the technology has proved to be an effective stimulation technique. While some challenges exist with water availability and water management, innovative regional solutions are emerging that allow shale gas development to continue while ensuring that the water needs of other users are not affected and that surface and ground water quality is protected. Taken together, state and federal requirements along with the technologies and practices developed by industry serve to reduce environmental impacts from shale gas operations.

Source: U.S. Department of Energy



Illinois Chamber Study

New natural gas production from Southern Illinois shale has the potential to create more than 45,000 jobs in Illinois and \$9 billion in economic investment, according to a new study released by the Illinois Chamber Foundation.

The study is the first of its kind to focus solely on Illinois' potential when it comes to increased hydraulic fracturing and horizontal drilling – techniques that have been used in other states to create a nationwide boom in natural gas and oil production, as well as increasing economic development and much-needed jobs. The study, "The Potential Economic Impact of New Albany Gas on the Illinois Economy," was conducted by Dr. David Loomis, professor of economics at Illinois State University. It includes these findings:

Three different scenarios: The New Albany shale formation is well known in the oil and gas production world, but it's unknown if these drilling techniques will be effective in extracting natural gas (or oil) economically – allowing for the ramp up of significant investment and production that has been seen in other areas of the country. Therefore, Dr. Loomis created three scenarios (low, medium, high) to determine the range of economic benefits that could come to Illinois.

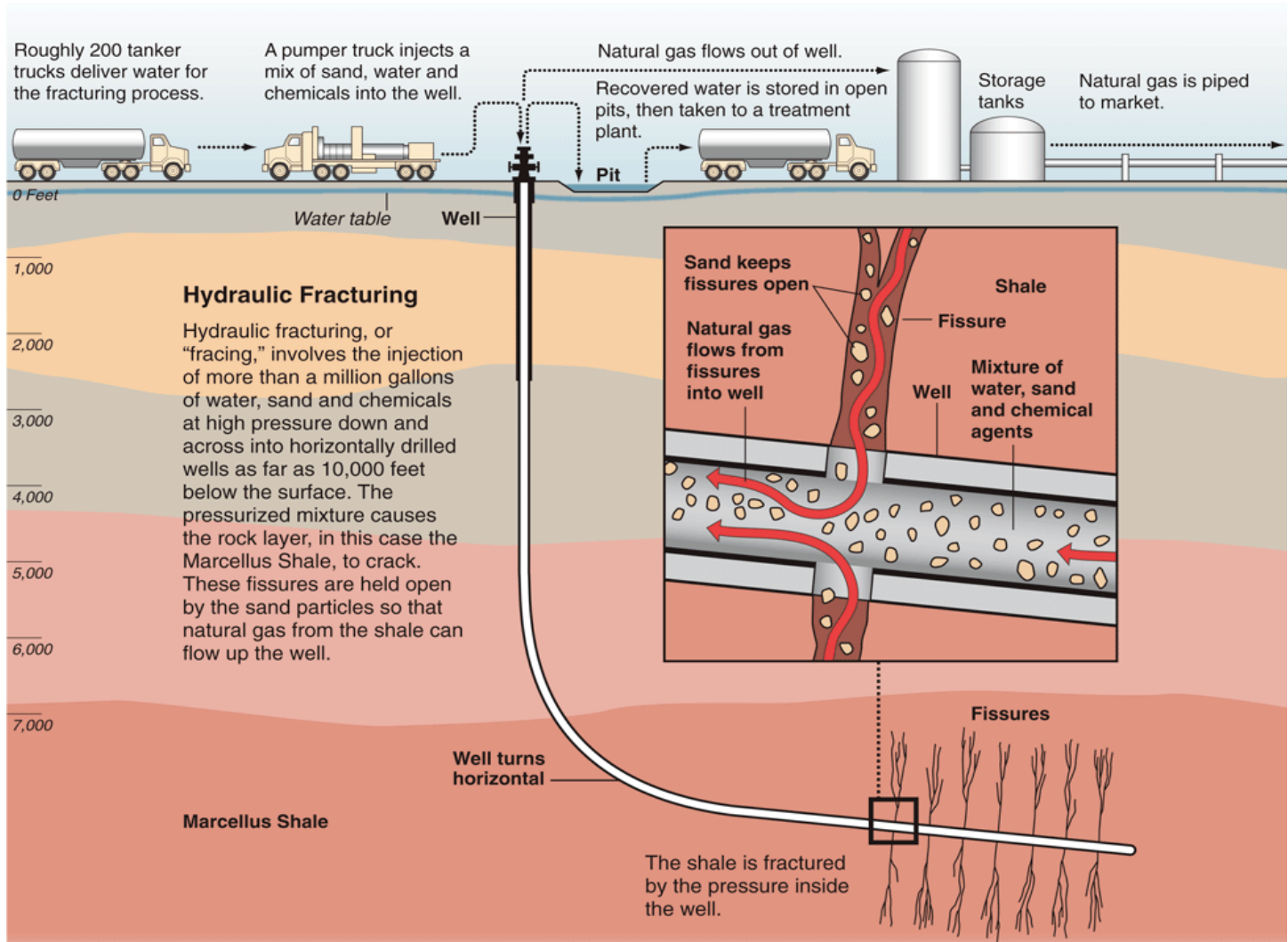
Jobs and economic impact: The total employment impacts (direct, indirect and induced impacts) for the three different scenarios are:

- 1,034 new jobs for the low scenario
- 10,337 new jobs for medium scenario
- 47,312 new jobs for the high scenario

This highest scenario translates into over \$9.5 billion of economic impact for the state. The economic impact could be even greater. The study's estimates are conservative in part because they do not include the economic impact of land leases that would be given to local landowners, nor does it look at what could happen if exploration discovers extractable oil deposits. Access the full report at www.ilchamber.org.

HYDRAULIC FRACTURING PROCESS

The U.S. has vast reserves of natural gas that are commercially viable as a result of advances in horizontal drilling and hydraulic fracturing technologies enabling greater access to gas in shale formations.



Graphic created by Al Granberg. Courtesy of ProPublica.

The process of hydraulic fracturing begins with building the necessary site infrastructure including well construction. Production wells may be drilled in the vertical direction only or paired with horizontal or directional sections. Vertical well sections may be drilled hundreds to thousands of feet below the land surface and lateral sections may extend 1000 to 6000 feet away from the well.

Fluids, commonly made up of water and chemical additives, are pumped into a geologic formation at high pressure during hydraulic fracturing. When the pressure

exceeds the rock strength, the fluids open or enlarge fractures that can extend several hundred feet away from the well. After the fractures are created, a propping agent is pumped into the fractures to keep them from closing when the pumping pressure is released. After fracturing is completed, the internal pressure of the geologic formation cause the injected fracturing fluids to rise to the surface where it may be stored in tanks or pits prior to disposal or recycling. Recovered fracturing fluids are referred to as flowback. Disposal options for flowback include discharge into surface water or underground injection.

Surface water discharges of the flowback are regulated by the National Pollutant Discharge Elimination System (NPDES) program, which requires flowback to be treated prior to discharge into surface water or underground injection prior to discharge. Treatment is typically performed by wastewater treatment facilities. Underground injection of flowback is regulated by either EPA Underground Injection Control (UIC) program or a state with primary UIC enforcement authority. Injection of natural gas production wastes would be considered a Class II injection well.

ILLINOIS HYDRAULIC FRACTURING REGULATORY ACT



On February 21, Rep. John Bradley (D-Marion) and Rep. David Reis (R-Olney) introduced **House Bill 2615** which creates the Illinois Hydraulic Fracturing Regulatory Act. The legislation presents a preliminary framework agreement on regulatory standards for hydraulic fracking.

The Hydraulic Fracturing Regulatory Act permits high volume fracking in Illinois while enforcing some of the nation's strictest water and air protections. **House Bill 2615** establishes the permit process, property owner notification, defines prevention standards and public input timelines. The bill has bi-partisan support. It was negotiated by officials from industry, agriculture, environmentalists, and Attorney General Lisa Madigan.

House Bill 2615 supporters include:

GROW-IL Coalition Members
Illinois Manufacturers' Association
Illinois AFL-CIO
Illinois Petroleum Council
Illinois Retail Merchants Association
America's Natural Gas Alliance
Illinois Railroad Association
Union Pacific Railroad
Illinois Association of Aggregate Producers
Illinois American Water
U.S. Steel Corporation
Chemical Industry Council of Illinois
Chicagoland Chamber of Commerce
Illinois Association of Convenience Stores
Illinois Petroleum Marketers Association
Illinois Oil & Gas Association
Illinois Fertilizer & Chemical Association
Illinois Trucking Association
Mid-West Truckers Association
Southwest Illinois Employers Association
Illinois State Council of Operating Engineers
Illinois Chamber of Commerce
State Council of Operating Engineers
Sierra Club
National Resources Defense Council
Environmental Law & Policy Center
Environment Illinois
Faith in Place
Illinois Attorney General's Office
Illinois Department of Natural Resources (DNR)
Illinois Environmental Protection Agency (EPA)

HOUSE BILL 2615 PROVIDES FOR:

- Extensive regulation of the drilling process, mandating numerous best practices.
- A requirement that all waste – which includes “flowback” of all the chemical-laced water pumped into the ground – be stored in closed tanks, rather than the pits that chronically leak and overflow elsewhere.
- Restrictions on venting and flaring of natural gas (which contains the potent greenhouse gas methane, as well as other harmful constituents, and turns to smog).
- A ban on the dangerous practice of injecting diesel (which contains carcinogenic hydrocarbons).
- Required disclosure of all fracking chemicals to the public before operations commence.
- Citizen rights to public hearings concerning proposed permits, and to appeal permits that are granted.
- Citizen enforcement against violations of law or permits.
- Provisions to protect the state's water supply, including authority to deny permits as necessary during drought conditions.
- Baseline and post-frack testing of potentially affected waters to help identify instances in which contamination may be associated with fracking.
- A presumption of liability for contamination that appears post-fracking in proximity to operations.
- A detailed application, containing information about planned operations, that must be posted on a state web site.
- Setbacks from population centers – including schools, residences, and nursing homes – as well as water resources and nature preserves.
- Mandatory plugging of nearby abandoned wells that can serve as pathways for contamination.
- Regulatory authority to address the problem of earthquakes induced by underground waste injection.
- Bonding and insurance requirements to enhance financial accountability.

On February 6, State Senator Mattie Hunter (D-Chicago) introduced **Senate Bill 1418** that calls for a moratorium on the drilling process of high-volume hydraulic fracturing in Illinois. The legislation would use the moratorium to allow two years for a science-based investigative task force to look at current and ongoing studies on fracking. Sen. Hunter's bill may prove difficult to pass given the failure of a similar moratorium bill last session.

Source: Illinois General Assembly. Summary of provisions provided by Natural Resources Defense Counsel (NRDC) and Environmental Law and Policy Center (ELPC).

RESOURCES



U.S. Department of Energy **<http://energy.gov/natural-gas>**

The Energy Department is investing in research and development to make natural gas production safe and sustainable. DOE released "Modern Shale Gas Development in the United States: A Primer," which provides regulators and policy makers with an objective source of information on technology advances and challenges that accompany deep shale gas development.

U.S. Environmental Protection Agency **www.epa.gov/hydraulicfracture**

Natural gas plays a key role in our nation's clean energy future. EPA is conducting a study to better understand any potential impacts of hydraulic fracturing on drinking water and ground water. The scope of the research includes the full lifespan of water in hydraulic fracturing.



Useful websites for data and reports on hydraulic fracturing

Illinois Department of Natural Resources **www.dnr.illinois.gov**

The Illinois Department of Natural Resources (DNR) is charged with managing, conserving and protecting Illinois' natural, recreational and cultural resources. If enacted, proposed legislation would put the DNR in charge of overseeing hydraulic fracturing.

Illinois Environmental Council **<http://ilenviro.org/>**

Illinois Environmental Council Education Fund engages in education and outreach and provides a forum for environmentalists. The Illinois Environmental Council serves as the environmental community's eyes, ears and voice in Springfield. The two organizations – collectively known as IEC – work together to ensure a more healthful environment for Illinois residents.

Illinois Oil and Gas Association **www.ioga.com**

The Illinois Oil and Gas Association was organized in 1944 to provide an agency through which oil and gas producers, land owners, royalty owners, and others who may be directly or indirectly affected by or interested in oil and gas development and production in Illinois, may protect, preserve and advance their common interests.

Illinois Chamber of Commerce – Energy Council **<http://ilchamber.org/policy-councils/energy/>**

The Illinois Chamber Foundation study is the first comprehensive look at Illinois jobs that could be created using hydraulic fracturing and horizontal drilling technologies.

Illinois Association of County Board Members
and Commissioners
413 West Monroe
Springfield, Illinois 62704

(217) 528-5331
(217) 528-5562 Fax
www.ilcounty.org