

Hydraulic Fracturing – Unsafe, Unregulated

Some environmentalists, desperate to address greenhouse gas emissions from coal and oil, have wrongly identified natural gas as the primary “cleaner” alternative. While it is true that burning natural gas emits half of the emissions of coal, natural gas extraction around the country creates dangerous risks to drinking and freshwater resources, and local air quality. Hydraulic fracturing, also called “fracking,” is a federally unregulated extraction process used in many natural gas drilling sites. The process can contaminate drinking water supplies with cancer-causing chemicals and significantly deplete freshwater aquifers. Natural gas extraction poses a grave threat to families, communities and ecosystems.

While for decades fracking was mainly conducted by smaller natural gas companies, the discovery of large gas reserves under shale formations in new areas of the country (such as New York and Pennsylvania) has resulted in the larger oil majors – ExxonMobil, ChevronTexaco and BP – becoming the largest frackers in the country. And now the Obama Administration’s State Department is promoting America’s fracking technologies to export fracking overseas – putting the administration in a position of a cheerleader for the industry. Cleaner, cheaper and quicker solutions to meet our energy demands are available. Renewable energy coupled with energy efficiency should diminish our dependence on dirty and dangerous fuels.

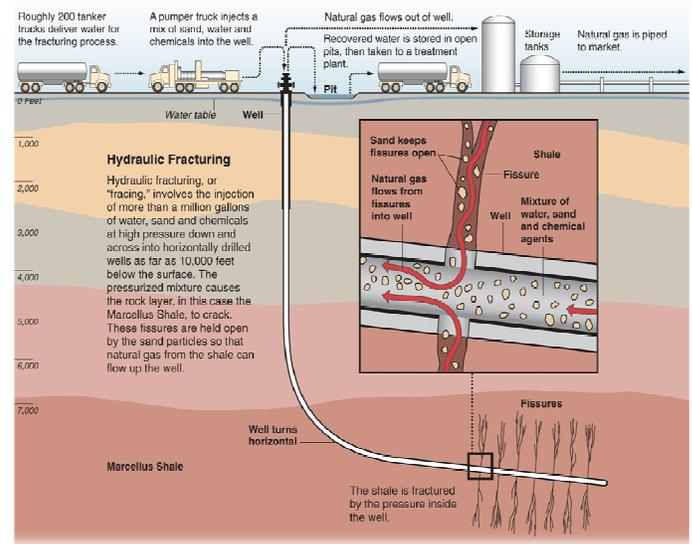
What is Fracking?

Hydraulic fracturing is the high-pressure injection of fracking fluid – a mixture of water, sand, and toxic chemicals – into the ground to break open and “fracture” rock formations to release liquid gas.¹ The controversial technique was developed in the 1940s by energy services company Halliburton. Modern practices such as horizontal fracturing and high-volume hydraulic fracturing allow drillers to extract greater amounts of gas than previously possible.² But at what cost?

The chemicals used in hydraulic fracturing often include substances that are toxic to humans and wildlife as well as carcinogenic. While particular fracking fluid chemical combinations differ based on the company and drilling location, many include toxic substances such as benzene, ethylbenzene, toluene, xylene and naphthalene. Other chemicals used include a variety of acids, polycyclic aromatic hydrocarbons, methanol, formaldehyde, ethylene glycol, glycol ethers, hydrochloric acid and sodium hydroxide.³ Fracking fluids may contain mixtures of hundreds of chemicals and agents. Yet, the precise chemical compositions used are secret; drilling companies refuse to disclose the composition of their fracking fluids, citing proprietary interests.⁴ The amount of these chemicals used can reach upwards of 50,000 gallons during the fracturing of a single well.⁵

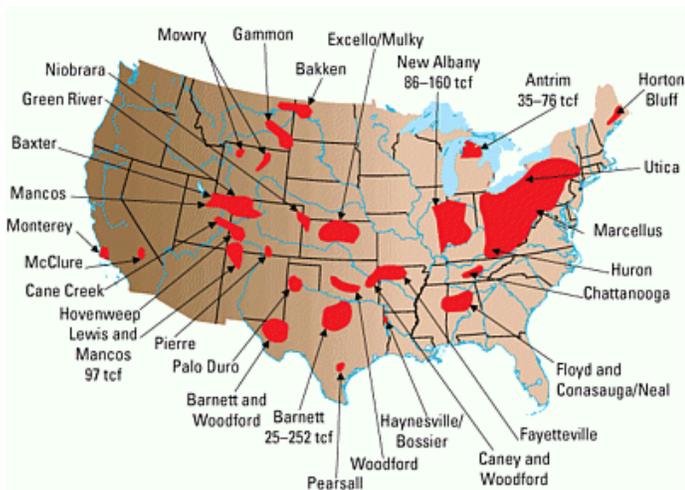
The infiltration potential of these fracking fluid chemicals into drinking water supplies is alarming. Even though the hydraulic fracturing process is designed to remove these chemicals, a large percentage – anywhere from 25-60 percent – are often left in the ground and never fully recovered.⁶ Furthermore, both the Environmental Protection Agency (EPA) and industry leaders have acknowledged that the potential exists for frack fluid to

migrate away from intended fracture lines and into nearby aquifers.⁷



Overview of hydraulic fracture process⁸

More than 30 states are involved in oil and gas production, and hydraulic fracturing is used in 9 of 10 gas exploration operations in several parts of the country including Texas, Alabama, Colorado, New Mexico, Wyoming and Montana.⁹ There are approximately 450,000 of these gas wells across the country, with a proposal for 100,000 more to be drilled in New York and 100,000 in Pennsylvania. A variety of new drilling techniques using hydraulic fracturing are also opening up gas deposits that had previously been too expensive to drill. One particularly large area, known as the Marcellus Shale, expands through Pennsylvania and parts of New York, Ohio and West Virginia.¹⁰



U.S. natural gas shale deposits ¹¹

In addition to the large oil majors, other companies involved in hydraulic fracturing services include Chesapeake Energy, Cabot Oil and Gas Co., BJ Services Co., Complete Production Services, Key Energy Services, Patterson UTI, RPC Inc; Schlumberger, Superior Well Services Inc. and Weatherford.¹² To date, companies involved in this process have had thousands of accidents and racked up a number of safety violations.¹³

Risk to Drinking Water

Hydraulic fracturing's potential impacts on both water usage and quantity can be significant. A single fracture of one well may require anywhere from 1 to 5 million gallons of water.¹⁴ To compare, a single fracture using 1 million gallons of water would roughly be equivalent to 2 Olympic size swimming pools.¹⁵ This also translates into as many as 200 truck loads of water per fracture of a well.¹⁶ Many wells require multiple fractures, some up to 18 times.¹⁷

With fracking comes an enormous threat of contamination of residential wells, groundwater aquifers and nearby surface water sources such as rivers and streams.¹⁸ From Virginia to Wyoming, hundreds of documented cases have surfaced regarding water quality and quantity problems in residential wells located near natural gas drilling operations.¹⁹ These reports include incidents of water wells being contaminated during and directly following hydraulic fracturing operations. Gases such as methane and hydrogen sulfide have been reported in drinking water, along with murkiness and discoloration of water. Cases of skin rashes and sickness after unknowingly showering in contaminated water supplies have been documented.²⁰

Federal Regulation: Unregulated and Unproven

Since 1974, regulatory protection of drinking water has fallen under the Safe Drinking Water Act. The act calls for monitoring of underground injection of chemicals that may come in contact with drinking water supplies.²¹ As a

result of the 1997 11th U.S. Circuit Court of Appeals decision in *Legal Environmental Assistance Foundation v. Environmental Protection Agency*, the EPA was charged with regulating hydraulic fracturing under the Safe Drinking Water Act.²² This decision led the agency to undertake an analysis in 2000 to determine the dangers posed by hydraulic fracturing to underground drinking water supplies.²³

During the same period, a special presidential task force on energy policy led by then-Vice President Dick Cheney convened in 2001. Because of Cheney's recent departure as CEO of Halliburton to return to politics, the secretive nature of the task force and its motivations were called into question.²⁴ Aided by industry professionals from Halliburton and other energy companies, the task force ultimately recommended that Congress exempt hydraulic fracturing from the Safe Drinking Water Act.²⁵ The EPA finished its fracking study in 2004 and found that fracturing "poses little or no threat" to drinking water and concluded no more research was necessary.²⁶ However, comments from whistleblowers and reviews of the report, notably by the Oil and Gas Accountability Project (OGAP), found that the EPA's conclusion that no further investigation of hydraulic fracturing was needed to be unpersuasive.²⁷

Congress ultimately exempted hydraulic fracturing from the regulatory authority of the Safe Drinking Water Act in the 2005 Energy Policy Act.²⁸ This exemption, known commonly as the "Halliburton loophole," created a unique situation where oil and gas companies are the only industry entities allowed to inject known hazardous chemicals either directly into or nearby underground drinking water supplies. Hydraulic fracturing is also exempted from other federal regulations that protect air quality, water treatment infrastructure and landowner's rights.

Congressional efforts to close the Halliburton loophole began in 2008. In 2009, the Fracking Responsibility and Awareness of Chemicals Act (FRAC ACT) was introduced by lawmakers in an attempt to close the Halliburton loophole. However, the bill has failed to win passage to date.²⁹

The EPA is also studying hydraulic fracturing's effects on drinking water supplies. Commissioned in 2010, the current study will likely conclude in 2012. As of Nov. 9, 2010, the EPA had requested chemical compositions from nine of the leading energy companies that participate in hydraulic fracturing.³⁰ All but one of those companies complied with the EPA's request. Halliburton refused and was issued a subpoena to provide the chemical makeup of the compounds it uses.³¹

Patchwork State Regulation

Because federal regulation of fracking is absent, states are left to determine monitoring protocols for hydraulic fracturing. As is the case with many issues where a clear lack of federal regulation exists, a patchwork of state regulations governs the natural gas exploration

process.³² Most state regulation does the bare minimum of merely collecting data on fracturing operations.³³ The majority of states that do have some drilling regulations in place enforce these through the permitting process. New Mexico, Colorado and Alabama regulate fracking through the permitting process. These controls monitor well depth, availability of freshwater supplies, disposal of chemicals and observation of open air fluid pits.³⁴

Some states like Pennsylvania allow for neighbors of a drilling operation to request an investigation when they believe their water may have been contaminated by fracking.³⁵

However, even with established monitoring and guidelines, states are stretched to handle the workload. The frenzied pace of new well drilling combined with state budgetary woes are hindering state level regulation. For example, according to the Citizen's Campaign Fund for the Environment, New York State lacks the funding and the trained professionals to ensure enforcement of any fracking operation in the state.³⁶

Recommendations:

- While the EPA study is under way, no new fracking operations should be permitted.
- Congress must close the 2005 Halliburton loophole for hydraulic fracturing. Injecting toxic substances into the ground falls squarely under the provisions of the Safe Drinking Water Act and thus the exemption for hydraulic fracturing should be eliminated from the 2005 Energy Policy Act.

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- 4 Natural Resources Defense Council (NRDC). Hydraulic Fracturing of Coalbed Methane Wells: A Threat to Drinking Water. (2002).
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- 6 See endnote 1
- 7 See endnote 1 . And Rodney R. Reynolds. 2003. Produced Water and Associated Issues -- Manual for the independent operator. Prepared for the South Midcontinent Region of the Petroleum Technology Transfer (PTTC) and Oklahoma Geological Survey (OK Geological Survey Open-file Report 6-2003).
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¹³ CBS News available at

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¹⁴ See Endnote 3 along with Information for Barnett wells: Burnett, D.B. and Vavra, C.J. August, 2006. Desalination of Oil Field Brine - Texas A&M Produced Water Treatment. p. 25.

¹⁵ One Olympic size swimming pools holds roughly 600,000 gallons of water. See swimming pool regulations at www.fina.org/project/index.php?option=com_content&task=view&id=51&Itemid=119

¹⁶ Rodney R. Reynolds. 2003. Produced Water and Associated Issues -- Manual for the independent operator. Prepared for the South Midcontinent Region of the Petroleum Technology Transfer (PTTC) and Oklahoma Geological Survey (OK Geological Survey Open-file Report 6-2003).

¹⁷ Suni, L. (2005). Our drinking water at risk: what EPA and the oil and gas industry don't want you to know about oil and gas fracturing. Earthworks

¹⁸ Lustgarten, A. (2008). Buried secrets: is natural gas drilling endangering U.S. water supplies?. ProPublica

¹⁹ See endnote 19

²⁰ See endnote 7

²¹ 42 U.S.C. § 300h

²² LEAF v. EPA, 11th Circuit Ct. of Appeals, 118 F.3d 1467 (1997), at p. 1475. The Energy Policy Act of 2005 later overturned this specific decision.

²³ See endnote 1

²⁴ See Natural Resources Defense Council's resource page containing records releases and other original documentation at

www.nrdc.org/air/energy/taskforce/tfinx.asp. Also see a complete resource listing of the National Energy Policy Development Group at

www.sourcewatch.org/index.php?title=Cheney_Energy_Task_Force

²⁵ See endnote 26

²⁶ See endnote 1

²⁷ See endnote 19

²⁸ 2 U.S.C. 1815, 661 and 661a, PL 109-58

²⁹ S. 1215--111th Congress: Fracturing Responsibility and Awareness of Chemicals (FRAC) Act. (2009). In GovTrack.us (database of federal legislation). Retrieved November 16, 2010, from

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³⁰ See endnote 15

³¹ Bradbury, D. 2010. EPA begins investigation into hydraulic

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www.guardian.co.uk/environment/2010/sep/14/epa-investigation-hydraulic-fracturing

³² See endnote 34

³³ Wiseman, H., "Untested Waters: the Rise of Hydraulic Fracturing in Oil and Gas Production and the Need to Revisit Regulation", 20

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³⁴ See endnote 34

³⁵ See endnote 34

³⁶ Citizen's Campaign Fund for the Environment, "Protecting New York's Air, Land, Water and People What's the Hydro-Fracking Rush?", available at www.citizenscampaign.org/PDFs/cce_hvhf_wp_final.pdf