Natural Gas Drilling & Water

An overview of hydraulic fracturing for natural gas in Northern Michigan.

Tip of the Mitt Watershed Council

What is fracking?

Hydraulic fracturing, also known as "fracking," is the process of injecting a mixture of water, chemicals, and sand underground to create fractures, through which natural gas can flow for collection.

Hydraulic fracturing in Michigan

Michigan has a rich history of oil and gas drilling. In fact, hydraulic fracturing has been used extensively for many years in Michigan. Roughly 9,900 Antrim Shale wells in Michigan produce natural gas at depths of 500 to 2000 feet. Hydraulic fracturing is used in virtually every Antrim Shale well. According to the Michigan Department of Natural Resources and Environment (MDNRE), there is no indication that traditional hydraulic fracturing techniques used in the state have ever caused damage to ground water or other resources.

Why are we concerned about fracking now?

A new gas discovery recently occurred in Northern Michigan, revealing potential natural gas reserves in the Collingwood and Utica Shale at depths of approximately 9,500 feet. Horizontal drilling and multi-stage fracking will be used to collect this gas, which is different than the hydraulic fracturing techniques historically used in Michigan. This drilling is not only deeper, it also uses substantially more fresh water (millions of gallons rather than up to one hundred thousand gallons) and chemicals. There are many unknowns with respect to the environmental and long-term impacts.

Current Site in Northern Michigan

Shown here is the Petoskey Pioneer #1-3 well in Missaukee County.

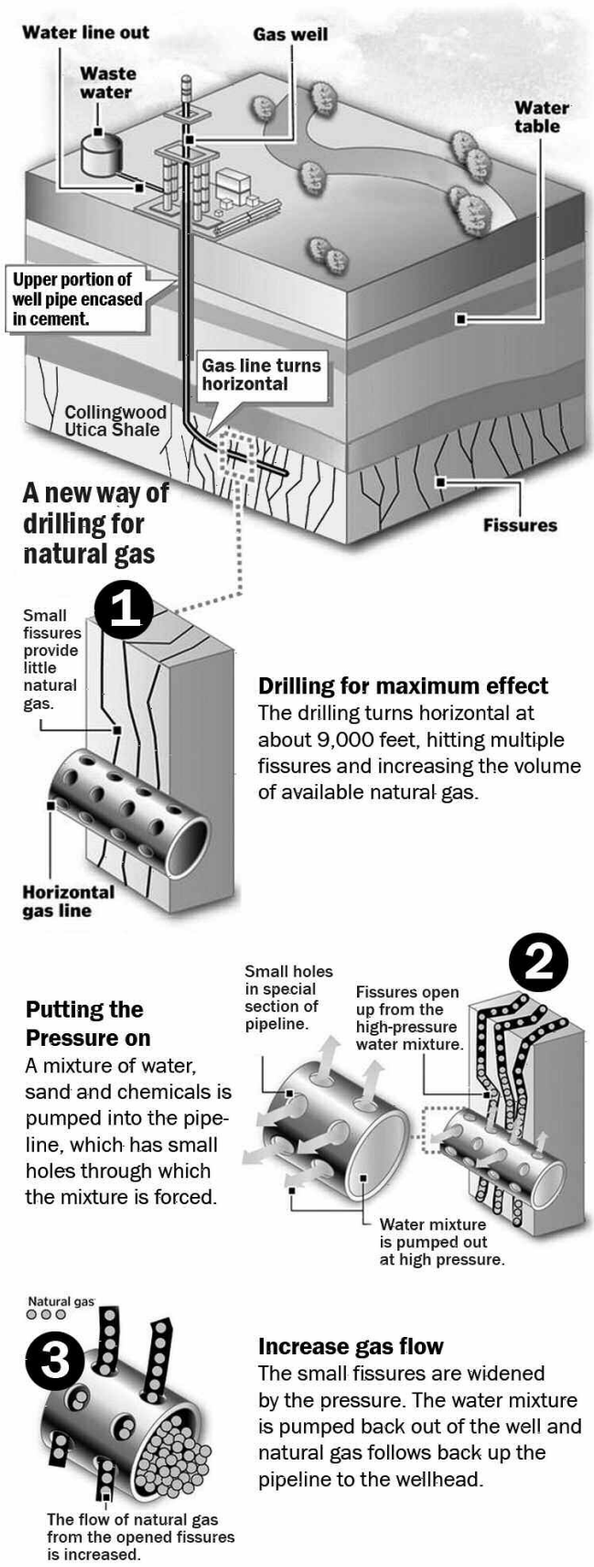
Incidents of surface and ground water contamination from the fracking process have been reported in other states. In Pennsylvania, state regulators found that gas drilling using high-volume fracking has caused contaminated drinking water, polluted surface waters, polluted air, and contaminated soils.

The Pending Science

Much is not known about the impacts of hydraulic fracturing. Currently, the US Environmental Protection Agency (EPA) has commenced a $1.8 million study to examine the impact of hydraulic fracturing on water resources. This is part of the President's budget request of $4.3 million for the EPA to continue its study of the relationship between hydraulic fracturing and drinking water resources.

"Fracking" retrieves natural gas from the ground

Hydraulic fracturing or "fracking" is a method for extracting natural gas and oil from deep in underground shale. If the use of fracking techniques increases in Michigan without proper regulations to provide necessary protections, there is concern that Michigan's surface, ground, and drinking water could be contaminated.



Where Do We Stand?

Tip of the Mitt Watershed Council is calling for stronger regulations and required use of best management practices to protect water resources from the impacts of fracking.

What is the impact of ground water withdrawals used for fracking?
Millions of gallons of water are used to fracture each well. Using fresh water to fracture a well is an unsustainable use of water resources, and its impact upon our fresh water supply must be carefully evaluated. By law, surface water withdrawals are prohibited for drilling operations because it is rich in organics, which can have a negative impact on the well. Therefore, the source of water used in fracking will be ground water. Unlike many other states, Michigan regulates water withdrawals which could add a layer of protection. However, the state is still determining the specific process and how to adequately address water withdrawals for fracking operations.

Can we find out what fracking chemicals are used in this process?
No. Fracking uses hundreds of undisclosed chemicals, which are mixed with water and pumped underground, directly through aquifers, to fracture rock. The cocktail of chemicals used in the fracking process is "undisclosed" from the public because it is considered to be a trade secret and proprietary information. In fact, the MDNRE can only obtain the chemical blend in the case of an emergency. We do know some of the individual chemicals used in fracking operations and, while these make up just a fraction of the total materials in the fluid, they include recognized carcinogens and hazardous materials such as hydrochloric acid and ethylene glycol.

What happens to the waste water and chemicals?
Once the fracking process is complete, anywhere from 40-70% of the fracture water comes back to the surface. This means that each well produces millions of gallons of wastewater, called flowback, which will have to be disposed of in injection wells. Because flowback fluids are part of an oil and gas operation, the fluids are designated as an oil and gas waste, even if there are hazardous chemicals in the wastes. This designation results in less protective requirements such as no requirement to analyze the constituents in the fluids prior to injection and the injection wells are exempt from local zoning.

How close together will the wells be?
Current law requires that drilling units for wells be a minimum of 80 acres. MDNRE Office of Geological Survey (OGS) has stated they recognize this size, which was set for typical vertical wells, is not appropriate for the new horizontal fracking wells. OGS will be proposing to make the lot size 640 acres, but a formal process with an Order issued by the Supervisor of Wells will determine the final size.

Should we be concerned about water contamination?
Errors in gas well construction or spills during transportation can occur and lead to water contamination. Fluids can spill before they are injected and fluids recovered from fracturing can contaminate surface waters. Additionally, drilling into these formations can create pathways by which fluids or natural gas itself can find its way into water supplies, if drillers are not careful. It should be noted also that the horizontal sections of the wells are not cased in cement and, therefore, leakage from these sections could represent a significant threat to ground water.

What other impacts may result from fracking operations?
Construction equipment emissions, fracking equipment, and unintentional gas leaks are sources of negative air emissions during the fracking process. Large areas of cleared land and many miles of roadways can scar the landscape and result in habitat fragmentation. Drilling operations also involve lights, 24 hours a day, and noise pollution from the initial month of drilling the well to the continuous noise generated by operation of compressor stations.

What else should property owners know?
Property owners should contact an attorney with experience with oil and gas issues to navigate through all the important elements connected to mineral right leases. Even if you do not agree to lease your mineral rights, you can be forced into an agreement under compulsory pooling.

Tip of the Mitt Watershed Council

How is the Tip of the Mitt Watershed Council involved?

Tip of the Mitt Watershed Council has been actively involved since the gas frenzy in the Collingwood and Utica Shale erupted. We are conducting research, educating landowners and the public, and working with the State to address many unanswered questions. Before commercial operations begin, Michigan needs to strengthen existing rules and regulations to address unanswered questions and unresolved issues. We will be fully engaged to ensure that this happens.

Michigan must take adequate measures to ensure that the problems that have occurred in other states do not occur here. Strategically located in the heart of the Great Lakes, we must make sure that Michigan's oil and gas regulations will protect our magnificent water resources and what makes Michigan the Great Lakes state.

FOR MORE INFORMATION

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Oil and Gas Leasing -
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Boyne City, MI 49712
231-582-6232 or toll free 888-678-3464
www.msue.msu.edu/charlevoix

Oil and Gas Regulations –
MDNRE Office of Geological Survey

Lansing Office:
P.O. Box 30256
Lansing, MI 48909
517-241-1515

Cadillac District Office:
120 W. Chapin St., Cadillac, MI 49601
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