

## Study Links Water Contamination to Hydraulic Fracturing

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A study published in the Proceedings of the National Academy of Sciences last week documents a link between hydraulic fracturing and water contamination. The peer-reviewed research, conducted by four Duke scientists, showed that water wells located close to active drilling sites had methane levels 17 times higher than water wells located further away.

The team of scientists, headed by Stephen Osborn, tested 68 drinking water wells in the Marcellus and Utica shale drilling areas in northeastern Pennsylvania and southern New York State. They measured dissolved salts and other constituents (carbon, boron and radium) as well as methane levels.

They found that the average methane concentration in drinking water wells located close to active drill sites was so high that it “fell within the defined action level for hazard mitigation recommended by the U.S. Office of the Interior”. Some levels were much higher. The researchers defined an active drilling area as within one kilometer – about 3280 feet – from a gas well.

Though they did not find evidence of hydraulic fracturing chemicals in the water wells, the researchers expressed alarm at what they see is a clear correlation between drilling activity and methane migration into drinking water. This demonstrates that pathways do exist for migration of other potential contaminants.

Methane is not regulated in drinking water because it does not alter the color, taste or odor and isn’t known to affect water’s potability. However, high levels can pose other health risks, such as asphyxiation and explosion in confined spaces. The Dept. of Interior recommends immediate action when levels reach concentrations of 28 milligrams per liter (mg/L). Some levels in the Duke study were as high as 64 mg/L.

In a White Paper accompanying their study, the Duke researcher made six recommendations. First, initiate a medical review of the health effects of methane. We simply do not know enough at this time, they say.

Second, they would like to see a national database listing methane, ethane and propane concentrations as well as other chemical attributes in drinking water. This is one way to determine whether high levels occur naturally or are associated directly with gas drilling and production.

We need to know more about how methane is getting into the drinking water, say the scientists. Is methane contamination due to poorly constructed well casings? Or is the process of fracking creating pathways for methane and other chemicals to migrate to the surface? The researchers would also like to see better estimates for greenhouse gas emissions of methane associated with shale gas extraction.

Their two final recommendations deal with water testing and waste disposal. “States should ensure that scientists collect extensive baseline data on water quality in drinking

water prior to exploration and drilling,” they write. In PA, drilling companies are presumed to be responsible for water contamination that occurs within a 1,000-foot radius of a drilling site if it occurs within six months of well completion.

One thousand feet is not enough, say the Duke researchers. They recommend at least 3,000 feet, and that testing be conducted by independent state-certified labs.

Drilling waste fluids are currently sent to public wastewater treatment facilities, injected into disposal wells, recycled and spread on roads for dust control. The Duke scientists note that drilling produces toxic waste fluids (including some with potentially high naturally occurring radioactivity). But, they say, there is “no comprehensive evaluation of long term impacts of wastewater disposal...”

What is needed, say the researchers, is a detailed evaluation of the safety of various disposal methods. For waste treatment facilities, a study would evaluate how much of the different chemicals are removed in the waste treatment plants. It would also look downstream at the long-term ecological effects of residual chemicals in the effluent.

The Duke team recommended two policy actions for the nation: regulate fracking under the Safe Drinking Water Act (SDWA), and fully disclose chemicals used in hydro-fracking. The SDWA regulates chemicals injected underground in order to protect drinking water, but the EPA has never regulated hydraulic fracturing under the Act. The scientists state that including fracking in the SDWA, either through passage of the FRAC Act (Fracturing Responsibility and Awareness of Chemicals Act) or other means would increase the public’s confidence in fracking and gas extraction.

Disclosure of fracking chemicals is currently voluntary. The EPA is gathering information about the chemicals as part of their ongoing study of hydraulic fracturing, but that won’t be made public for another year. Meanwhile, in mid-April the minority members of the Congressional Committee on Energy and Commerce released a report of chemicals used in hydraulic fracturing. In it they listed more than 700 chemicals currently used by gas drilling companies (see article page 2).

The researchers conclude that horizontal drilling, hydraulic fracturing, and shale-gas extraction in general would benefit from more study, better review of potential health consequences, and stronger regulations. They also suggest that the industry invest research and development in safer and more consistent extraction technologies.

You may read the entire text of the Duke study online at:  
<http://www.pnas.org/content/early/2011/05/02/1100682108.full.pdf+html>

## **SIDEBAR**

### **Does NY Require Disclosure of Fracking Chemicals?**

Not yet - but a pair of bills introduced this January (S425/ A2922) seeks to change that.

The proposed legislation would: require the disclosure of hydraulic fracturing fluids; prohibit the use of fracking chemicals that pose a risk to human health (those that are persistent, bio-accumulative and toxic or are known mutagens); and prohibit the issuance of drilling permits for wells proposing to use hydraulic fracturing fluids until the DEC has adopted rules and regulations.

On April 12 the NY Senate Environmental Committee defeated the senate version, with Senator Tom O'Mara voting against the measure.