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Marcellus Watch: A river of waste

By Peter Mantius
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The two sides of the fracking debate often talk past each other, pushing aside rational analysis. One touts the rare economic opportunity shale gas offers, while the other warns of environmental catastrophe.

Both sides need to stop talking long enough to listen when the latest objective science crushes old assumptions.

A new study by two Stony Brook University scientists commands that attention. It analyzes water pollution risks associated with high-volume horizontal hydrofracking of the Marcellus Shale, and it pinpoints the biggest problem: disposing of fracking wastewater.

The study was written by Stony Brook doctoral student Daniel Rozell and Dr. Sheldon Reaven, a professor in the Department of Technology and Society and the School of Marine and Atmospheric Sciences. It appeared in the August 2012 issue of the journal Risk Analysis, published by the Society for Risk Analysis.

Rozell and Reaven used "probability bounds analysis" to rate five potential pathways for water contamination related to fracking. They concluded that four of those pathways - all furiously debated in public - were several orders of magnitude less significant than the disposal challenge.

Yes, gas well casings often leak. Yes, wastewater trucks tip over and spill. Yes, over time, toxic substances might even seep up from deep horizontal wells into fresh water aquifers near the surface. And yes, once in a while, a well pad waste containment pond or tank might fail and cause a major local spill.

But those types of problems - significant though they are - are almost negligible next to the big-ticket item of wastewater disposal.

Even in a best-case scenario, one Marcellus well could release at least 200 cubic meters of contaminated fluids, the scientists found.

"Given typical well spacing in the Marcellus Shale, if only 10 percent of the region (parts of New York, Pennsylvania, Ohio and West Virginia) is developed, this would equate to 40,000 wells," the report concludes. "Using the best-case median risk determined above, the volume of contaminated water would equate to several hours of flow of the Hudson River or a few thousand Olympic-sized swimming pools."

That river of waste is currently exempt from federal regulation under the Safe Drinking Water Act due to legislation passed in 2005.

The exemption was a political gift to the energy industry, and it has helped fuel the shale boom. Unfortunately, it has not cleaned any wastewater, reduced its volume or made it less dangerous.

Flowback is composed of fracking chemicals used in the drilling process, plus materials from the Marcellus formation itself, including sodium, chloride, bromide, arsenic, barium, uranium, radium and radon. In many cases they are carcinogens present at levels that exceed federal drinking water standards.

So where will this toxic stew wind up, if New York State begins granting permits to frack the Marcellus?

That's hard to say.

In their Supplemental Generic Environmental Impact Statement for high-volume fracking, state Department of Environmental Conservation officials suggest disposal options, cross their fingers and hope for the best.

The September 2011 document reports that the drilling industry had given assurances that it would try to boost recycling of fracking wastewater. But it goes on to concede that fresh water still makes up 80 to 90 percent of fluid used to frack gas wells in the Susquehanna River Basin.

In other regions of the country, drillers force flowback water down injection wells. But New York's geology is unsuitable for injection wells, so that's not the solution.

The state used to allow brine from gas wells to be spread on roadways, but radioactive elements in Marcellus flowback kill that option.

Shipping it out of state might work, but there are few places that still accept toxic flowback and they are expensive.

Other than illegal dumping - a growth industry, for sure - the main options left involve disposal at municipal treatment plants. "The amount of wastewater treated in public sewage facilities seems to be underreported and actual levels may be as high as 50 percent," the scientists reported.

But those plants aren't capable of treating the worst contaminants in fracking flowback, so actual treatment must occur elsewhere. "Treatment at a municipal wastewater treatment facility could be categorized as non-treatment," the scientists said.

So where will treatment take place, by whom and how effective will it be? The SGEIS leaves plenty of wiggle room on those questions.

Meanwhile, for enforcement purposes, the DEC will track fracking flowback under less stringent rules than would be required if fracking didn't hold its special exemptions.

In their summary, Rozell and Reaven say that future studies need to collect and analyze data on "the ability of industrial and municipal wastewater treatment facilities to remove contaminants from used hydraulic fracturing fluid."

That's the sort of tough, unglamorous work that the energy industry, the government, academia - somebody - needs to do before we can ever hope to reach a rational compromise on drilling for shale gas.

Peter Mantius is a freelance journalist who resides in Schuyler County and closely follows shale gas drilling issues. He is an author former longtime reporter for the Atlanta-Journal Constitution, and former editor of two business weeklies in the Northeast.

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