

Study Raises Questions about Fracking Fluid

VICKI SMITH, Associated Press

MORGANTOWN, W.Va. (AP) — A gas company that legally doused a patch of West Virginia forest with salty wastewater from a drilling operation killed ground vegetation within days and more than half the trees within two years, a new report from the U.S. Forest Service says.

Lead researcher Mary Beth Adams says that the damage to the quarter-acre, detailed in a case study published in the *Journal of Environmental Quality*, shows the need for more research into industry practices.

"There is virtually no information in the scientific literature about the effects of gas well development on forests in the eastern U.S.," she said Monday. That "paucity of knowledge" must be filled so land managers and regulators can make better decisions.

For starters, Adams' report suggests West Virginia create a land-disposal formula that incorporates not only the concentration of salt and chemicals in treated hydraulic fracturing fluid but also the size of the area it can be applied to. Adams says that could help prevent overdoses like the one that occurred in the Monongahela National Forest.

One group has seized on the report already, arguing it shows the need for tighter regulations on how industry disposes of fracking fluid.

"This study suggests that these fluids should be treated as toxic waste," argues Jeff Ruch, executive director of a whistleblower group, Public Employees for Environmental Responsibility. "The explosion of shale gas drilling in the East has the potential to turn large stretches of public lands into lifeless moonscapes."

But industry leaders say that in trying to protect the rest of the Monongahela, federal officials created a situation that doesn't reflect reality, forcing the driller to overload an inappropriately small site — an agreed-upon quarter acre.

"It was set up for failure," said Bob Radabaugh, a longtime forester, industry consultant and owner of S & R Gas Interests in Glenville. "In reality, you want to be able to spread this out on as big an area as you can. What they did was restrict it to a very small area.

"They did right by the forest," he said, "but it backfired on them."

Gas drilling has been a staple of the Appalachian economy for generations, but the industry is in overdrive as unconventional horizontal drilling and fracking technologies allow companies to go deeper. Many are rushing to tap the Marcellus shale field underlying parts of Ohio, Virginia, West Virginia, Pennsylvania and New

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York.

In 2007, Berry Energy Inc. of Clarksburg began drilling a conventional, vertical gas well in a section of the Fernow Experimental Forest, a part of the Monongahela set aside for research.

Adams said what unfolded over the next two years was an unexpected opportunity for observation.

Some results were expected, from deforestation and road damage to runoff and erosion. Others, including the dramatic die-off when wastewater was land-applied, were not.

Berry Energy didn't immediately return messages Monday, but the report says that in June 2008, under a permit from the state Department of Environmental Protection, it sprayed 75,000 gallons of treated fracking fluid on the quarter-acre.

Adams said the Forest Service hoped to minimize damage and was only told afterward that the industry standard is to use a much larger area.

"We were surprised when the vegetation responded so quickly because we were told there would be no effect, 'This is done all the time,'" Adams said. "And there was a very dramatic response."

Within a few days, all ground vegetation was dead. Within 10 days, the leaves of the hardwoods began to turn brown and drop. Within two years, more than half of the 150 trees were dead, and sodium and chloride concentrations in the soil were 50 times higher than normal.

Those levels declined over time, but the report says high salt content in the soil had another unexpected result: It attracted foraging white-tailed deer and black bears, slowing the regrowth of vegetation.

Corky DeMarco, executive director of the West Virginia Oil and Natural Gas Association, said his members reuse as much fracking fluid as possible. What's left largely goes to underground injection wells, not land application. And state law forbids the land application of fracking fluid of Marcellus wells, regardless of whether it's been treated.

But even before the land application in Fernow, the scientists spotted problems.

When foliage on two dozen trees near the well pad died, they discovered workers had lost control of the drill bore, resulting in an aerial release of fluid. According to state records cited in the report, 15 percent of that fluid was hydrochloric acid.

The damage could have been caused by high pH from a plug that was used to hold the fracking fluid in the geologic formation, the report says. Or, a low pH solution with high chloride levels could be responsible.

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"Clearly, a better knowledge of the chemical makeup of the drilling and hydrofracing fluids is needed," it concludes.

Berry Energy also drilled through three caves in the porous limestone Karst formations that underlie the forest, the report said. Known for sinkholes, caves and streams that sink underground, the Karst formations are fragile environments for rare and threatened creatures, from salamanders to the endangered Indiana bat.

Dye studies could trace water movement in the Karst and help evaluate the safety of drilling operations, the report says. While vegetation is relatively easy to evaluate, there is little data about the potential impact of drilling on animals, it notes, "and indeed, some may be more sensitive."

The U.S. Forest Service has proposed banning horizontal drilling and fracking in Virginia's George Washington National Forest due to concern for the ecosystem, but it has yet to recommend one for the Monongahela.

Last week, Deputy Chief Joel Holtrop told a U.S. House subcommittee that the Forest Service is not proposing a national policy but will instead tackle drilling proposals case by case, considering "place-based plans" and public concern.

Berry Energy has drilled only one well in the Monongahela but holds all the mineral rights under Fernow and under about one-third of the Otter Creek Wilderness Area.

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Forest Service report: <http://www.nrs.fs.fed.us/pubs/37268> [1]

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