Drilling for Gas:

Closed Loop System Offers Alternative to Waste Pits

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One of the biggest concerns about gas drilling that has been voiced by local residents is the question of storing and treating the wastewater generated in the gas drilling process. At a conventional drilling site, the water and fracking fluids used in drilling the well are often stored in open pits that are dug near the well.

In New York State, brine or salt water produced by drilling may be temporarily stored on site in a watertight tank or an earthen pit. NY Department of Environmental Conservation (DEC) regulations state that storage pits must be either lined with watertight material, or lie above an impermeable soil such as heavy clay or hardpan. The regulations also dictate that storage is temporary.

Storing chemically-laden fracking fluids and produced "briny" water in a storage pit – even temporarily – presents some environmental problems that many landowners would like to avoid. An open pit can flood during a storm event, spilling toxic chemicals into the soil and potentially endangering drinking water. Birds and other animals may be attracted to the water; ranchers in New Mexico report death and increased abortion rate among their herds exposed to drilling water.

Once the drilling is completed, wastewater stored in pits is supposed to be transported to a water treatment plant. There are few water treatment plants that can handle the industrial wastewater produced by a gas well, says Nick Schoonover, founding member of the Tioga County Landowners Group. The nearest one, he explained, is across the border in Pennsylvania.

Concern about the amount of water that will be withdrawn from local rivers for drilling, as well as the increased truck traffic required to haul the wastewater from drill sites to a treatment plant, drove Schoonover to research alternatives.

"I believe the solution is closed loop drilling," Schoonover told *Broader View Weekly* in an interview last month. "It would immediately get rid of pits." Not only that, closed loop drilling would address a number of other problems that Schoonover sees with conventional gas well drilling.

Part of the reason a conventional drilling site requires a large well pad, notes Schoonover, is the need for reserve waste pits for drilling slurry and other fluids. He estimates that a closed loop system might reduce well pad size from 4-6 acres to 3-4 acres; the Oil and Gas Accountability Project (OGAP) estimates a reduction in surface disturbance closer to half an acre.

Drilling a vertical well requires close to 350,000 gallons of water and fracking fluid. The horizontal drilling and fracking required to extract natural gas from the Marcellus Shale will require anywhere from 1 to 3 million gallons of water per well. The water will most likely be trucked in by large tankers – Schoonover estimates 300 truckloads per well.

"Add to that around 200 tanker trucks to remove the wastewater, and the fact that right now the closest disposal facility is about 300 miles away, and that's a lot of road impact, traffic, and noise pollution," Schoonover said.

A closed loop system offers a drilling site both de-watering and wastewater management. The process involves separating solids from liquids, using both mechanical means (shaking and screens) and chemical means. A centrifuge spins the water out of the solids. The gravel-like solids, drill cuttings, are dried and then – if they are not contaminated – used to construct access roads or new well pads.

The water is stored for re-use in the drilling process. "According to the EPA, drillers using this method see an 80 percent reduction in use of water," Schoonover said. Not only that, re-using water reduces truck traffic some 75 percent and eliminates the need for reserve pits, plastic liners, and fencing.

An OGAP study of two wells in Matagorda City, TX backs up Schoonover's figures. The wells were drilled 200 feet apart. One used closed loop drilling and the other used conventional drilling with a waste pit. The two wells were drilled into the same formation, and used the same crew and the same drilling rig.

OGAP's findings show that the well using the closed loop system realized a 43 percent savings in costs for drilling fluids. They also realized a savings in drilling – the drill bits saw 23 percent fewer rotating hours, and there was a 37 percent reduction in the number of drill bits used. The drillers finished the job in 2/3 the time required by the conventional well, and the company noted that recycled water increased the penetration of bits through the substrate.

A study of wells in New Mexico found that companies using closed loop drilling saved, on average, $11,000 on costs related to drill site installation, fluid hauling, disposal, and mitigation of surface damage. Drilling mud and wastes were reduced by 15,625 barrels. Similar savings have been recorded by drilling companies in Colorado.

New Mexico requires the use of pitless – or closed loop – drilling systems as part of their "best oil and gas development practices". Schoonover believes that NY must likewise demand that companies drilling for gas use closed loop systems, and has developed a power-point presentation that explains the process. He has already shown his program in Candor, and plans to present it at a future Tioga Landowners Group meeting in Tioga Center.

"BLM lists closed loop systems in their best practices," Schoonover said. "Now we need to get DEC to make it [closed loop] the law of the land."