

Natural Gas Well Development and Production in the Upper Delaware River Watershed [Click Here for a Printer Friendly Page](#)

June 11, 2008

Carol Collier
Executive Director
Delaware River Basin Commission
West Trenton, New Jersey

Re: Natural Gas Well Development and Production in the Upper Delaware River Watershed

Dear Director Collier,

Delaware Riverkeeper Network advocates that the Delaware River Basin Commission take an active part in regulating natural gas well drilling, development and production in the Delaware River Watershed. We submit this information and outline our concerns in order to provide support for action by the Commission due to increased interest and activity in development of wells in the Marcellus Shale formation in the Upper Delaware River region.

As you know, parts of both Pennsylvania and New York states are included in the Marcellus Shale formation. Industry representatives have been approaching landowners with offers for leases in the region, particularly Wayne County, PA and Delaware, Sullivan, Chenango, and Broome Counties, NY.

Delaware Riverkeeper Network is concerned about the environmental impacts of these proposed wells, particularly the impacts on water resources (quantity and quality) and on habitat. Our concerns are heightened because we do not consider existing state regulations to be sufficient to protect the Delaware River and its tributaries from the effects of gas well drilling, development and production.

Our concerns are based on research we have been doing in recent weeks concerning the practices used by companies that work in this industry and on what we have learned about current regulations and laws, both at the state and federal level. These findings are not final or complete - our investigations are ongoing. Due to the urgency of the issue and the rapid pace of natural gas exploration activities in the Marcellus shale formation, we wanted to communicate our thoughts sooner rather than later. We will share new information and concerns as we discover them.

DRN's present concerns regarding well drilling and construction, well development, gas production, and permanent infrastructure are outlined as follows:

Both Pennsylvania and New York require well drilling permits for natural gas wells. However, regulation by the States of the practices that would be used to access, develop, produce and deliver the natural gas reserves in Marcellus Shale is scant and inconsistent.

a.. Water Quantity Concerns: We understand that it is estimated that

about 1 million gallons of water is used when a gas well is hydraulically fractured, a process that will be used to stimulate the production of natural gas. The water for hydraulic fracturing (or "fracking") is either pumped from nearby streams or other surface water bodies or obtained from a drilled water well. It is then injected into the well; some of the water is recovered, usually stored on site in an open pit. The water may be used more than once for the "fracking" process. The water is then released or removed, sometimes re-used elsewhere. The water use may be classified as consumptive and/or depletive, depending on the disposition of the used water. It is estimated that between 50% and 20% of the water is lost in the well bore (amount depends on depth of well, type of geology and technology).

Since the states will not be regulating these water withdrawals and since the water use for individual and multiple wells has the potential to significantly impact the water resources of the Delaware River Basin, we support action by the DRBC to regulate these wells, individually and collectively, as projects. We support that the DRBC has the authority and the responsibility to regulate these wells. We consider DRBC regulation to be a preferred management approach because it can provide comprehensive, river resource-protection oriented and consistent decision making for the Upper Delaware River Watershed.

a.. Water Quality Concerns: We are not certain specifically what substances will be added to the water injected into the gas wells during the "fracking" process. Indeed, this information is not easily uncovered because of exemptions to the industry under some federal laws and under certain provisions of public access regulations in Pennsylvania and New York. But we do know that chemicals and other materials are typically added to water to constitute the fluid that is injected into the well. The injection is performed under pressure, causing fractures to open and the fluids to enter the underground geologic formations, possible contaminating the aquifer or deep water reserves. DRN points out that this is a discharge to groundwater in the Upper Delaware Basin that should be regulated by the Commission.

We have researched this water quality issue based on similar gas well "fracking" procedures to find out what chemicals and other additives may be added to the water. We discovered that liquid carbon dioxide, liquid nitrogen, crude oil, kerosene, various lubricants, friction reducers, gels, surfactants, defoamers, polymers, biocides and proppants are commonly used in fracking, according to the EPA.[1] USGS reports that natural gas condensates may also contain the chemicals benzene, toluene, ethyl benzene and xylene, known as "BTEX".[2]

A report submitted to Congress by an EPA whistleblower employee in 2004 revealed that acids, BTEX, formaldehyde, polyacrylamides, chromates, and other toxic substances may be introduced underground and to deep aquifers during fracking.[3]

Testing of pit water contents in New Mexico had a 30% detection rate for the chemicals tested including polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi volatile organics (SVOs), including arsenic, lead, mercury, 2,4-Dinitrotoluene, 2-Methylnaphthalene, phenol, benzene, m,p-Xylene, sulfate, barium, cadmium, chromium.

DRN is very concerned that these chemicals may be used and introduced to the ground and/or surface waters of the Delaware River Watershed by the development of natural gas wells. Poor regulation of the use and injection of chemicals and additives in the fracking process and poor management of the pits that store the contaminated fracking fluids elsewhere in the nation has resulted in pollution and human health impacts. It is of utmost importance that the use of such chemicals is addressed head-on here in the Delaware River Basin before gas well development begins in order to prevent degradation of water quality. We understand that it has been reported that some companies have pledged not to use fracking chemicals but this must be verified and regulated by the responsible agency, not left to a voluntary pledge.

a.. Horizontal Drilling: One of the relatively new technologies being used in accessing natural gas across the nation is horizontal drilling. The well is drilled downwards and then turns so that the lower part of the well bore parallels the gas zone. The industry uses this method to enhance gas recovery. Since large reserves can be accessed from one drilling point, it is considered economical by gas companies. Dangers lie in the enhanced ability of fracking fluids to migrate spatially with the well bore, possible stability impacts and the danger of unknowns associated with drilling further into uncharted underground formations. Interference between adjacent wells is a risk. Large tracts of land should be required for such drilling and spacing of such wells needs to be regulated. The Commission is in a regulatory and policy position to look at this issue of spacing and cumulative impacts of horizontally drilled and producing wells from the perspective of large watershed impacts. The States are not in that position.

a.. Stormwater Management: DRN reviewed the applicable stormwater regulations and erosion and sediment control approvals that would be required in both Pennsylvania and New York. The State's regulations are not consistent. While Pennsylvania Department of Environmental Protection has recently (May 2008) adopted a stormwater rule for oil and gas well construction, it only applies when 5 acres or more are disturbed (Well pad areas may not break that threshold). New York expects to review erosion and sediment control plans when their generic environmental assessment form is completed by a gas well permitted under the NY State Environmental Quality Review Act, but there is not a stormwater rule tailored to gas drilling projects. NYSDEC staff reports that the threshold of 5 acres is not usually met so SPDES stormwater requirements are not typically kicked in.[4] (New York has experience with gas wells outside of the Delaware River Watershed).

Complicating matters is the exemption of the industry under the federal Energy Policy Act, which involves the National Pollution Discharge Elimination System (NPDES) nonpoint source pollution program, including stormwater management regulation under the state-administered NPDES programs (recent court rulings may result in these federal laws being applied).

The Commission is in a unique and influential position in regards to this issue. The Special Protection Waters Program, which was adopted for the Upper Delaware in 1992, protects the high water quality and outstanding resources of the Upper Delaware River. The rules of Special Protection Waters require that new projects receive Commission approval for nonpoint source pollution control plans for the project area. DRN considers the

Commission's powers regarding SPW to be key in protecting the river from polluting stormwater runoff from the changed land use that accompanies well drilling construction, development and ongoing production.

Nonpoint source pollution control plans that govern the final infrastructure required for a gas well will also be required. We also bring to your attention the fact that the feeder pipelines from wells, pumping stations, and trunk pipelines and their associated facilities are all a necessary part of natural gas well development in the Upper Delaware. As such, this aspect of individual and multiple well projects needs evaluation and regulation by the Commission.

We are aware that the areas that drain to the New York City Reservoirs are not subject to Special Protection Waters. However, the water quality of those waters is of paramount importance to New York City who relies on these reservoirs for water supply. New York City has adopted a watershed protection program as part of an agreement with the U.S. Environmental Protection Agency in lieu of spending tens of billions of dollars on water treatment filtration systems for the Upper Delaware reservoirs. That watershed program has proven to be a success, largely because of strict regulation and oversight by the City who has opted to protect its water supply by preventing pollution to the reservoirs.

While the Commission's Special Protection Waters nonpoint source pollution control requirements do not apply to the reservoir drainage areas, the City's regulations do apply. We support New York City's strict oversight of any gas wells drilled and developed in their drainage area and will be contacting the City directly. We do consider that the Commission realizes that the water resources of the reservoirs are part of its purview in that the tailwaters of the reservoirs are part of the river's resources and the river tributaries that are dammed by the reservoirs and travel from the impoundments downstream flow to the river and are part of the Commission's water resource responsibility.

a.. Impoundments: There is inconsistency in the Pennsylvania and New York regulation of the open pits that are typically used for storage of fracking fluids at a well site. Pennsylvania allows a pit to be located on a watercourse (if it exceeds certain size and storage limits, a dam safety permit is required) and both states have specific setback requirements from streams and other water bodies for the wells. Pennsylvania Bureau of Oil and Gas Management staff stated that the pits are considered temporary, not an ongoing impact.[5] DRN is very concerned that these pits will be located on a tributary to the Delaware River and that they will contain and release, either by design or by accidental breaching or liner failure, chemicals or additives to the waterway.

As discussed above, the water quality impacts that can accompany the use of fracking chemicals poses significant harm to the Upper Delaware's water resources and to human health. DRN advocates for the Commission to regulate these pits as part of the project. DRN also points out that these pits should not be allowed to receive stormwater runoff or other water (such as running water from a stream) and that separate and distinct stormwater management measures employed on these sites should meet best management practice standards. DRN also points out that closed systems (such as containment structures) instead of open pits are being used in some parts of the nation to protect water and air quality and to conserve water resources.

a.. Permanent Infrastructure: The Millennium Pipeline is being constructed across the Upper Delaware River Watershed at this time. We understand that there have been some attempts to drill under the Delaware River near Hancock, NY. This project is connected to gas well development in the Marcellus Shale. To deliver the produced gas, gathering lines are installed in the ground from individual wells that then tie together and would be connected to the Millennium Pipeline.

a.. This pipeline is also capable of delivering gas to industries or other consumers in the area, such as a town. This permanent infrastructure is part of the gas well project and needs oversight and regulation as well by the Commission since the pipeline is an interstate project and impacts the Upper Delaware River watershed resources. Regulation should be of the permanent feeder and gathering lines as well as the trunk pipeline.

DRN received and reported one hotline pollution complaint on March 24, 2008 related to a reported spill at the Millennium Pipeline construction site on the East Branch of the Delaware River near Hancock, NY and Damascus, PA. DRN reported the pollution account to the PA Hotline and to the NY State Spill Incident Report Hotline. The report was investigated by Pennsylvania officials. DRN is concerned that as construction resumes on the pipeline there will be incidents of pollution releases to the Delaware River and/or its tributaries that will impact the water resources of the river.

a.. Scale of Gas Well and Natural Gas Production: There are no requirements in either state that limit overall scope of gas well fields. New York has some minimum acreage and spacing requirements (these are being reviewed by the New York legislature presently and may be changed) but neither state has a limit on the number of wells that can be placed on the landscape or in a subwatershed. This lack of control over the scale of the built gas well system and delivery infrastructure is of great concern. Areas where large scale gas well fields have been developed elsewhere have been thoroughly transformed from a natural environment to an industrial condition.

The natural habitats and animal and plant communities that depend on and live in these habitats are of outstanding value to the Delaware River watershed. Much of the region is covered with mature and highly valuable forest. All wildlife as well as rare, threatened and endangered species rely on the healthy, intact ecosystems that make up the Upper Delaware River Watershed and the Upper Delaware Scenic and Recreational River. These ecosystems are not replaceable and they are inexorably connected to the water resources of the river. DRN advocates for the Commission to provide the comprehensive oversight needed to assess and then protect through regulation the integrity of these resources.

Delaware Riverkeeper Network points out that 15 million people, including the major population centers of New York City and Philadelphia, rely on the Delaware River for water supply. The value of that water must be considered when decisions are being made regarding natural gas well development and production. The Commission is the most capable agency and the clearly responsible entity for regulating towards the goal of water resource protection in the Delaware River Basin through regulation of the natural gas industry in the Upper Delaware River Watershed.

Thank you for considering our input while addressing the role of the Commission regarding this crucial issue. We will be submitting further information in subsequent communications.

Sincerely,

Maya K. van Rossum
the Delaware Riverkeeper

Tracy Carluccio
Deputy Director

cc: Susquehanna River Basin Commission
NYSDEC
PADEP
New York City DEP

[1] U.S. Environmental Protection Agency, Office of Solid Waste, "Associated Waste Report: Completion and Workover Wastes", January 2000.

[2] Williams, Ladd and Farmer, "Fate and transport of Petroleum Hydrocarbons in Soil and Ground Water at Big South Fork National River and recreation Area, Tennessee and Kentucky, 2002-2003", U.S. Geologic Survey, 2006 p. 10, <http://pubs.usgs.gov/sir/2005/5104/PDF/SIR20055104.pdf>

[3] Weston Wilson, "EPA Allows Hazardous Fluids to be Injected into Groundwater", October 8, 2004.

[4] Personal communication between Kathy Sanford, NYSDEC Division of Mineral Resources, and Tracy Carluccio, 5.30.08

[5] Personal communication between David English, PADEP and Tracy Carluccio, 5.19.08