



Delaware Riverkeeper Network
300 Pond Street, Second Floor
Bristol, PA 19007
tel: (215) 369-1188
fax: (215) 369-1181
drkn@delawariverkeeper.org
www.delawariverkeeper.org

THE TRUTH ABOUT NATURAL SHALE GAS EXTRACTION IN THE UPPER DELAWARE RIVER WATERSHED What You Need to Know

Drilling for natural gas in Marcellus and other shales requires polluting development methods, including:

- **Hydraulic fracturing:** “Fracking” (or “fracing”) is the practice of injecting fluid and sand into the rock formation to open fractures to release gas. Fracking markedly boosts production. Fracking fluids contain chemicals, many of them hazardous and carcinogenic - up to 154 hazardous contaminants (State of New Mexico).¹ In PA, public records show that formaldehyde, a human carcinogen, acids, pesticides that are toxic to fish and aquatic life, and at least 85 other hazardous materials are added to the fracking water being used (PADEP).² The drilling and fracking processes introduce chemicals into the well and also disturb, distribute, and bring to the surface chemicals/minerals from beneath called “flowback” (such as salts, sulfides, and “normally occurring radioactive materials” or NORMS, which occur in the region; NORMS have required decontamination elsewhere such as at 140 sites since 2005 in Texas’s Barnett Shale).³ The wastewater is stored in open pits at the well site posing air and water pollution risks.
- **Horizontal drilling:** The well bore is directed down and extended horizontally to access the shale (usually about a mile down and at least a mile horizontally). This expands the amount of gas that can be recovered from each well. It takes between 2 and 9 million gallons of water to frack a deep horizontal well.⁴ Multiple wells are often developed on each pad requiring 3-5 acre pads, miles of driveways and feeder pipelines, noisy and brightly lit construction sites, increased stormwater runoff, fragmented habitats, air polluting machinery and thousands of truck trips to the site.

These practices have impacts: Environmental pollution is reported around the country near natural gas wells either from spills, accidents or well development practices⁵. However, gas drilling is exempt from many provisions of federal environmental laws.⁶ Virtually no human health studies are underway to assess the impacts on people. For instance, the situation is so severe that in Colorado a Health Impact Assessment has been called for due to pollution problems there.⁷

Examples of pollution:

- In Dimock Twp., Susquehanna Co., PA natural gas (methane) has intruded into the local water, fouling water wells and forcing homes on water tanks after a water well exploded in January, 2009.⁸ In September, 2009, 3 spills of fracturing fluids occurred; 2 entered Stevens Creek, causing a fish kill. In Western PA and West Virginia, 30 miles of Dunkard Creek that borders both states was ruined in a weeks-long disaster that came to a head in September, 2009; 161 species of fish, mussels, and salamanders died in the stream, which flows to the Monongahela River. A water quality emergency occurred in the fall of 2008 and twice again in 2009 on the Monongahela from an overload of gas drilling wastewater that led to a bottled water advisory for 325,000 people, including Pittsburgh⁹. In Bradford Twp., McKean Co., PADEP found Schreiner Oil and Gas responsible for contaminating at least 7 water supplies with methane and/or high levels of iron and manganese, ruining local wells.¹⁰

¹ www.emnrd.state.nm.us/OCD

² Don Hopey, “State concerned about waste water from new gas wells”, Pittsburgh Post Gazette, 12.21.08 and <http://www.riverreporter.com/issues/08-12-18/frac.pdf>

³ “Radioactive Waste Surfaces at Texas Gas Sites”, Peggy Heinkel-Wolfe, Denton Record-Chronicle, 11.11.07.

⁴ “Gas Well Drilling and Development, Marcellus Shale, June 12, 2008 Commission Meeting”, www.srbc.net

⁵ <http://www.earthworksaction.org/pubs/Spills.pdf>, <http://www.earthworksaction.org/oilgaspollution.cfm>

⁶ http://www.earthworksaction.org/COtoxics_reg_gaps.cfm

⁷ Witter, et al, “Potential Exposure-Related Human Health Effects of Oil and Gas Development: A White Paper”, Colorado State University, University of Colorado, page1 and 21.

⁸ Steve McConnell, “Gas driller found in violation for ‘polluting’ groundwater”, Wayne Independent, 3.10.09

⁹ PADEP News Release 10.22.08, “DEP investigates source of elevated total dissolved solids in Monongahela River”,

<http://www.ahs.dep.state.pa.us/newsreleases/default.asp?ID=5337&varQueryType=Detail>

¹⁰ <http://www.ahs2.dep.state.pa.us/newsreleases/default.asp?ID=5494&varQueryType=Detail>¹⁰

- In Susquehanna Co., diesel spills related to gas drilling by Cabot dumped 100 gal., 800 gal. and 100 gal. of fuel on the ground in 3 separate incidents.¹¹
- In Pavillion, Wyoming, the USEPA has investigated contamination of 11 water wells near Encana Corp. gas wells that had been developed with hydrofracking. Methane and 2-butoxyethanol phosphate were found by EPA.¹²
- In an incident in Louisiana, 20 cattle died from drinking fluid next to a hydrofracked natural gas well.
- In Hickory, PA, farmer Ron Gulla's fish pond has been polluted and polluted runoff continues to ruin his farm¹³; PADEP says the lack of pre-drilling condition data lets Range Resources off the hook. PA's shale region is experiencing pollution from natural gas storage facilities, pipelines and gas wells¹⁴.
- In Arkansas, two major wastewater companies were shut down after high salt levels were found in a reservoir and fish kills occurred in a local creek.¹⁵
- Newsweek recounted a fracturing fluid spill that sent a worker to the hospital and is being investigated as the cause of his nurse's near death illness¹⁶.
- Wyoming geologists found benzene 1,500 times the level safe for people in a water well near hydrofracked gas wells.
- Hundreds of water contamination reports are documented in CO, Alabama, Ohio, Texas, and PA.¹⁷

Wastewater from natural gas development, high in total dissolved solids (TDS), salts and containing toxins and "flowback" contaminants, must be disposed of at a treatment plant but there are not enough facilities. Sewage plants can't handle the contaminated waste. Injection wells and mines are being considered as disposal sites; some companies are re-using wastewater at gas well sites. PADEP has proposed regulations in November for effluent standards for TDS, chloride, and sulfate, but they allow interim permitting while standards and rules are worked out for how to dispose of the wastewater.¹⁸ Air pollution is emerging as a major human health and environmental problem in drilling areas, especially where drilling has been occurring for a period of time¹⁹; NYSDEC's DSGEIS projects that gas development may violate existing air standards.²⁰

Explosions, accidents, fires, and emergencies come with natural gas exploration and well development. These require municipal emergency response, even though in some ways municipalities are being prevented from having controls over gas drilling operations within their borders -- gas companies are suing Pennsylvania towns to stop local regulation, such as stormwater, wellhead, floodplain and zoning ordinances.²¹ Examples of emergencies:

- In Leidy Township, Clinton County, PA, a gas well exploded into flames Sept. 14, 2008; special firefighters from Texas were brought in to contain the fire, which was expected to burn for weeks.²²
- In Appomattox County, also on September 14, a Williams Gas Co. pipeline that runs from the Gulf Coast to New York exploded without warning, destroying 2 homes and damaging 6 others, hurting 5 people, causing the evacuation of a neighborhood of hundreds, and leaving a 50 foot crater behind.²³
- In Greene County, PA a worker was killed and another badly injured when a coalbed methane gas well exploded.²⁴
- In Dallas-Ft. Worth, Texas, drilling in shale by Chesapeake Corp. may have caused earthquakes. Wells drilled deep to store flowback water from natural gas wells are blamed for inducing earthquakes according to geoscientists.²⁵
- In Ohio, one home exploded, another home narrowly averted an explosion, and 46 wells in the area are contaminated by methane gas that leaked from a Ohio Valley Gas Company well into the aquifer. The problem is still unresolved and homes are on bottled water and some are vacated while water lines are built to the neighborhood.²⁶

What you can do: Get more info. and sign up for action alerts at www.delawariverkeeper.org

PROTECT OUR CLEAN WATER! WE CANNOT SACRIFICE WATER FOR GAS!

¹¹ <http://www.riverreporter.com/issues/09-03-12/news-gasglance.html>

¹² <http://www.propublica.org/feature/epa-chemicals-found-in-wyo.-drinking-water-might-be-from-fracking-825>

¹³ <http://uk.reuters.com/article/environmentNews/idUKTRE5422TG20090503?sp=true>

¹⁴ <http://uk.reuters.com/article/environmentNews/idUKTRE5422TG20090503?sp=true>

¹⁵ Lauren Trager, "Department of Environmental Quality Tells Two Wastewater Companies to Shut Down", KARK News, 12.15.08

¹⁶ Jim Moscou, "A Toxic Spew?" Newsweek, 8.20.08.

¹⁷ Abraham Lustgarten and ProPublica, "Drill for Natural Gas, Pollute Water", Scientific American, 11.17.08.

¹⁸ <http://www.pabulletin.com/secure/data/vol39/39-45/2065.html>

¹⁹ http://earthworksaction.org/pubs/DishTXHealthSurvey_FINAL_hi.pdf; Wyoming-DEQ_pinedale anticlncomments.pdf

²⁰ New York State Department of Environmental Conservation, "Draft Supplemental Generic Environmental Impact Statement..." Sept. 2009.

²¹ Brief of Amici Curiae, Nockamixon Township, the Delaware Riverkeeper, Delaware Riverkeeper Network, American Littoral Society, and Damascus Citizens for Sustainability in Support of Appellants, In the Supreme Court of Pennsylvania, Western District, July 8, 2008.

²² Jim Runkle, "Gas Well Fire Could Burn for Weeks", Loch Haven Express, 9.16.08

²³ Candice Nelson, Carrie Sidener, "Gas Company Talks to Families about Explosion", WSLs and Lynchburg News and Advance Reporter, 9.16.08, and Candice Nelson, "Community Moves Forward after Appomattox Explosion", 9.16.08.

²⁴ Don Hopey, "Gas Well Incident Claims 1 in Greene County", Pittsburgh Post-Gazette, 12.3.07.

²⁵ Thomas Korosec and Jim Polsen, Chesapeake Water Wells May Have Caused Earthquakes, Bloomberg.com, 8.14.09.

²⁶ Joan Demirjian, "Home near gas well on brink of explosion" Chagrin Valley Times, 10.22.08.

<http://www.chagrinvalleytimes.com/NC/0/274.html>