



RIVERKEEPER

Volume 1

Industrial Gas Drilling Reporter



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Introduction

For over a year Riverkeeper has tracked the prospect of industrial gas drilling in New York State. While gas drilling in New York is not new, what is new is the magnitude, scope, and location of the proposed drilling method of high-volume hydraulic fracturing. Indeed, industrial gas drilling throughout the Marcellus Shale and other shale reserves in New York has the potential to impact the environment and communities dramatically.

Riverkeeper’s Industrial Gas Drilling Reporter is intended to collect the many issues associated with this activity – from New York’s ongoing environmental impact study to reported drinking water contamination in states where Marcellus industrial gas drilling already occurs.

Our goal is to update our members and the general public on the many issues associated with this important and dynamic issue, and to help concerned citizens make informed decisions during the public participation component of New York’s upcoming draft Supplemental Generic Environmental Impact Study. Riverkeeper will update this reporter periodically.

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Cover photo of a well site during active Marcellus Shale drilling in Upshur County, West Virginia, in 2008. (An additional water storage pit is not in the photo.) Used by permission of West Virginia Surface Owners' Rights Organization: www.wvsoro.org. Copyright WVSORO, June 2008.

Riverkeeper is an independent environmental organization dedicated to protecting the Hudson River, and its tributaries, and the New York City drinking water supply. For more information about us please visit www.riverkeeper.org.

Riverkeeper is a founding member of the Waterkeeper Alliance (www.waterkeeper.org) an international organization that works with over 180 Waterkeepers to protect waterways around the globe.

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Background

What is the Marcellus Shale?

The Marcellus Shale is a layer of deep sedimentary rock, deposited by an ancient river delta, with the remains of it now forming the Catskill Mountains. The vast Marcellus Shale extends from Tennessee, through most of West Virginia, across Pennsylvania and eastern Ohio, and into the Southern Tier of New York, including the Catskills and the West-of-Hudson portion of the New York City Watershed. New York's portion of the Marcellus Shale is approximately 18,750 square miles and is very deep – over 1 mile below ground.

What is Hydraulic Fracturing?

New technology, called hydraulic fracturing, allows drilling companies to extract natural gas from this shale. Natural gas is trapped within fractures between the grains of this fine-grained rock. Drillers drill down vertically into the shale, turn 90 degrees to drill horizontally (sometimes over a mile in length), and then inject water, sand and chemicals under high pressure to release the gas. The pressurized water forms fractures in the rock, which sand and chemicals then pop open.

What are some of the Environmental Impacts?

There are many environmental impacts associated with hydraulic fracturing, or “hydrofracking.” Among them are water consumption and wastewater disposal, toxic chemicals used in hydrofracking, substantial truck traffic, air pollution, noise from the loud hydrofracking operations, and surface water runoff from these large industrial sites. The cumulative effect of these impacts may indeed transform entire communities – turning previously rural, agrarian areas into “fractured communities.”

Hydraulic fracturing requires up to 3 million gallons of water *per hydrofrack*, and typically each well is hydrofracked many times. The water must be trucked in, stored on-site, and the wastewater disposed of properly (nearly all of the fracking fluid injected returns to the surface, bringing with it materials from underground including brines, heavy metals, radionuclides, and organics). Even though the gas industry claims that toxic chemicals represent less than 1% of hydrofrack fluid, the U.S. Geological Survey explains that for a typical 3 million gallon hydrofrack this results in 15,000 gallons of chemical waste. In existing Marcellus wells outside of New York this waste is stored on-site in large holding ponds until trucks haul it away.

What is the New York City Watershed?

The New York City Watershed, largely in the Catskills, is the source of tap water for over 8 million New York City residents and over 1 million New Yorkers upstate. The entire New York City Watershed comprises approximately 4.2% of the State's land, yet supplies *unfiltered* drinking water

to half the State's population. All surface water and stormwater runoff within the New York City Watershed drains into large reservoirs and travels via gravity through tunnels and aqueducts to the taps of 1 million upstate consumers and 8 million New York City consumers. The entire system delivers 1.2 billion gallons daily. The 1,560 square mile system in the Catskills (1 million acres) includes six reservoirs and their drainage basins, hundreds of miles of aqueducts and tunnels, and is home to approximately 60,000 people. The New York City Watershed, including its infrastructure, is the State's greatest natural resource and the City's greatest capital asset.

Riverkeeper played an instrumental role in protecting the source of this tap water when it helped structure the 1997 Watershed Memorandum of Agreement, a landmark agreement that establishes ground-rules for protecting the City's water supply. This agreement set the stage for the City to continue to receive a waiver from federal laws otherwise requiring filtration, known as the filtration avoidance determination (FAD). The FAD allows the City to avoid building a new \$10 billion water filtration plant to filter City water, in exchange for strong watershed protection programs.

New York State Environmental Review

No hydraulic fracturing into the Marcellus Shale will take place in New York until the State completes an update to its 1992 Generic Environmental Impact Statement (GEIS), pursuant to the State Environmental Quality Review Act (SEQRA). Riverkeeper helped shape the scope of review for this study. Each *Industrial Gas Drilling Reporter* will provide a status update on this critical environmental review.

Fractured Communities

DOES INDUSTRIAL GAS DRILLING THREATEN U.S. WATER SUPPLIES?

There have been several recent reports from Pennsylvania, Wyoming, Colorado, Ohio, and elsewhere regarding gas drilling operations contaminating local drinking water supplies. In Pennsylvania, the PA Department of Environmental Protection found that an industrial gas drilling operation contaminated at least seven water supplies. Two water supplies were contaminated with methane and five with iron and manganese. The contaminants exceeded established drinking water standards. The company responsible, Schreiner Oil and Gas Company, has received a number of violations for over-pressured wells and failure to submit well records since they began actively drilling in the area in the fall of 2008. Residents in the affected area must rely upon bottled water.

See <http://www.ahs2.dep.state.pa.us/newsreleases/default.asp?ID=5494#%3E%3Chttp://www.ahs2.dep.state.pa.us/newsreleases/default.asp?ID=5494>

In Wyoming, in July 2008, a water well in rural Sublette County showed benzene in a concentration 1,500 times the level safe for people. One of the largest natural gas fields lies in this county, home to 6,000 gas wells. According to an investigative report, state and local officials have documented hundreds of instances of contamination in states experiencing gas drilling through hydraulic fracturing.

See <http://www.propublica.org/feature/buried-secrets-is-natural-gas-drilling-endangering-us-water-supplies-1113>

In Dimock, Pennsylvania, several drinking water wells have exploded. In February 2009, the PA Department of Environmental Protection charged Cabot Oil & Gas with violations for the contamination, under the theory that gas leaked from well casings into underground fractures and up to the surface.

See <http://www.timesunion.com/AspStories/story.asp?storyID=794270>

See also <http://www.propublica.org/feature/officials-in-three-states-pin-water-woes-on-gas-drilling-426>

Outside Cleveland, Ohio, an entire house exploded after gas seeped into the home's water well. The Ohio Department of Natural Resources (DNR) later issued a lengthy report concluding that a nearby gas well's faulty concrete casing caused methane to be pushed into an aquifer, ultimately causing the explosion. The Ohio DNR later required the driller to replace the water well.

Ohio Dept. of Natural Resources initial evaluation:

http://www.bainbridgetwp.com/dynamic_content/special_reports/FinalAnalysisfromODNRConcerningEnglishWellDrilling.pdf

Ohio Dept. of Natural Resources Order:

<http://ohiodnr.com/portals/11/bainbridge/2009-order-by-chief-2.pdf>

Read the full 153-page report here:

http://s3.amazonaws.com/propublica/assets/natural_gas/ohio_methane_report_080901.pdf

In Colorado, an exhaustive examination of a methane problem in western Colorado concludes that gas drilling has degraded water in dozens of water wells. The report is significant because it is among the first to broadly analyze the ability of contaminants to migrate underground in drilling areas.

Read the full Colorado report: <http://www.garfield-county.com/Index.aspx?page=1143>

See <http://www.propublica.org/feature/colorado-study-links-methane-in-water-drilling-422>

FLAMMABLE TAP WATER IN COLORADO

Some Fort Lupton, Colorado residents can light their tap water on fire. For months, residents have lived in fear that their tap water, which is contaminated with natural gas, may cause their home to explode. Water tests conducted in October 2008 confirmed that eight nearby natural gas wells had contaminated residential water wells.

For videos of flammable tap water, see:

<http://www.airandaqua.com/blogs/flammable-water-fires-up-colorado/>

<http://www.youtube.com/watch?v=o-m8--uWh9s>

http://www.youtube.com/watch?v=ny8SuaMdE_0&annotation_id=annotation_595811&feature=iv

DEAD COWS IN LOUISIANA

According to news reports, a spill from a natural gas well caused at least 20 cows to drop dead in Louisiana. The Louisiana Department of Environmental Quality confirmed high levels of potassium chloride in and adjacent to the cow pasture. Potassium chloride is one chemical used in hydraulic fracturing as a “completion fluid.” The state findings indicated a “milky white substance” flowed from the natural gas well and pooled into a low area in the pasture that was accessible to the cows. Neighbors and onlookers witnessed the deaths and reported that the cows appeared to be suffering a slow, painful demise, with many bellowing loudly, bleeding and foaming at the mouth.

For more information read these articles:

<http://arklatexhomepage.com/content/fulltext/?cid=62992>

<http://www.ksla.com/Global/story.asp?S=10325772>

<http://www.shreveporttimes.com/article/20090501/NEWS01/905010342/1060>

WASTEWATER DISPOSAL PROBLEMS IN FAYETTEVILLE SHALE – LANDFARMS NOT A VIABLE OPTION

A study conducted by the Arkansas Department of Environmental Quality (ADEQ) found that fluids used in industrial gas production have been improperly applied on landfarms operating in the state, thus endangering the environment. “Landfarm” is a term to describe holding and storage facilities for water-based fluids or mud resulting from wastewater in hydraulic fracturing. As a method to dispose of fracking wastewater, landfarms are unique to certain areas and should not be used in New York State. Evidence of environmental contamination has been discovered at every permitted landfarm studied where water is used in industrial gas drilling, according to the ADEQ. At each of the sites, contaminated fluids had run off into nearby creeks or streams and chloride concentrations in surrounding soil were abnormally high.

See www.adeg.state.ar.us/ftproot/Pub/pa/News_Releases/2009-04-20_ADEQ_releases_landfarm_report.mht

See also www.arkansasnews.com/2009/04/20/study-finds-problems-with-water-used-to-drill-natural-gas-wells/

Read the study here: http://www.adeg.state.ar.us/diroffice/pdfs/landfarm_report.pdf

LEAK FROM GAS WELL KILLS FISH AND AQUATIC LIFE

A leaking waste water pipe from a Range Resources Marcellus Shale gas well drilled in Washington County, Pennsylvania polluted a Cross Creek Lake tributary, killing fish, salamanders, crayfish and aquatic insect life in approximately three-quarters of a mile of the stream. The PA Department of Environmental Protection said Range Resources reported the May 26 waste water discharge from a coupling on a 6-inch pipe running from a recently drilled well to a waste water impoundment.

For more information read these articles:

<http://www.post-gazette.com/pg/09155/975107-100.stm>

http://www.philly.com/philly/wires/ap/news/state/pennsylvania/20090605_ap_gaswellswastewaterkillsfishinswpastream.html

EXPERT SAYS INDUSTRIAL GAS DRILLING CAUSED TEXAS EARTHQUAKES

Texas’ leading earthquake expert said intense industrial gas drilling likely caused a series of small Texas earthquakes. The tremors appear to be the first ever recorded in Cleburne, a city of 30,000 about 50 miles southwest of Dallas. Cleburne sits near the heart of the Barnett Shale gas field. Since

2001, more than 200 industrial gas wells have been drilled within the city limits. Surrounding Johnson County has more than 1,000 gas wells. According to the U.S. Geological Survey, more earthquakes have been detected in the area since October 2008 than in the previous 30 years combined.

For more information read these articles:

<http://www.dallasnews.com/sharedcontent/dws/dn/latestnews/stories/060909dnmetquakes.40620de.html>

<http://online.wsj.com/article/SB124476331270108225.html>

Read University of Texas FAQ on earthquakes:

<http://www.ig.utexas.edu/research/projects/eq/faq/tx.htm>

BARNETT SHALE AIR POLLUTION PROBLEMS

Texas environmental officials have concluded that industrial gas drilling in the Barnett Shale contributes about as much air pollution to the Dallas-Fort Worth area as car and truck traffic.

See <http://www.star-telegram.com/news/story/1413456.html>

TOMPKINS COUNTY ASKS FOR GAS DRILLING SAFEGUARDS

In May 2009 Tompkins County, New York officials urged the State to delay the permitting of Marcellus Shale wells until it has adequately developed and funded an inspection and enforcement program. County legislators unanimously passed a resolution outlining concerns about the New York regulatory process, which the NYS Department of Environmental Conservation should be re-evaluating in its upcoming draft Supplemental GEIS.

See www.theithacajournal.com/article/20090520/NEWS01/905200368/1126/Tompkins+County+Legislature+asks+for+safeguards+on+gas+drilling

Legislation Update

CONGRESS CONSIDERS BILL TO REGULATE FRACKING AND CLOSE “HALLIBURTON LOOPHOLE”

Representatives Maurice Hinchey of New York, Diana DeGette of Colorado, Jared Polis of Colorado, and Senator Bob Casey of Pennsylvania, introduced companion Senate and House bills that would remove the “Halliburton Loophole” from the Safe Drinking Water Act, and allow this important federal law to regulate industrial gas drilling in relation to drinking water and to force drilling companies to reveal the chemicals used in hydraulic fracturing. On June 9, 2009 both the House and Senate introduced The FRAC Act (Fracking Responsibility and Awareness of Chemicals Act). Generally, the EPA regulates anything that may affect underground drinking water supplies, but in 2005, the energy industry successfully lobbied the Bush Administration to exempt hydraulic fracturing from the Safe Drinking Water Act. The House Subcommittee on Energy and Mineral Resources held a hearing on the issue on Thursday, June 4, 2009.

Read Rep. Hinchey’s Press Release:

http://www.house.gov/list/press/ny22_hinchey/morenews/060909NaturalGasFrackingBillIntro.html

For more information read these articles:

www.npr.org/templates/story/story.php?storyId=104565793&ft=1&f=1025

<http://www.grist.org/article/2009-06-06-gas-drilling-congress-hearing/>

<http://www.reuters.com/article/marketsNews/idUSN0938671520090609>

<http://www.grist.org/article/2009-06-09-congress-bills-protect-water/>

<http://www.propublica.org/feature/frac-act-congress-introduces-bills-to-control-drilling-609>

Link to the FRAC Act:

http://s3.amazonaws.com/propublica/assets/natural_gas/frac_act_house_090609.pdf

http://s3.amazonaws.com/propublica/assets/natural_gas/frac_act_senate_090609.pdf

EPA ADMINISTRATOR ACKNOWLEDGES THAT EPA SHOULD REVIEW FRACKING IMPACT ON DRINKING WATER

In response to a question from New York Congressman Maurice Hinchey during a hearing, EPA Administrator Lisa Jackson said she believed her agency should review the risk that hydraulic fracturing poses to drinking water in light of various incidents across the country that raise questions about the safety. The 2005 Energy Policy Act exempted hydraulic fracturing from regulation under the Safe Drinking Water Act, which was designed to protect drinking water supplies. This exemption is referred to as the “Halliburton loophole.”

See <http://www.shaleshock.org/hinchey-gets-epa-administrator-jackson-to-acknowledge-agency-should-review-hydraulic-fracturing-impact-on-drinking-water/>

NEW YORK ASSEMBLY BILL WOULD BAN GAS DRILLING WITHIN NEW YORK CITY WATERSHED

New York Assemblyman James Brennan and 11 others recently introduced a bill to prevent industrial gas drilling within the New York City Watershed and to require the disclosure of chemicals used in hydraulic fracturing.

See <http://www.propublica.org/article/new-york-drilling-bill-would-override-state-regulators-to-protect-water-608>

Link to the proposed legislation:

<http://assembly.state.ny.us/leg/?bn=A08748&sh=t>

DRBC REQUIRES COMMISSION APPROVAL BEFORE LAUNCHING INDUSTRIAL GAS EXTRACTION PROJECTS

On May 19, 2009, the Delaware River Basin Commission (DRBC) announced that no industrial gas extraction projects will be allowed within the Delaware River Basin's Special Protection Waters without the DRBC's approval. The Wild and Scenic Delaware River has exceptionally high water quality and is a resource used by nearly 15 million people. The Delaware River also serves as the primary drinking water source for the cities of Philadelphia and Trenton. With this announcement, the DRBC recognized the substantial impacts that industrial gas drilling has on the environment and water quality. The DRBC intends to adopt more stringent regulations following public input. DRBC must grant approval before any drilling commences.

See http://www.state.nj.us/drbc/newsrel_naturalgas.htm

Recent Gas Drilling Reports and Studies

U.S. GEOLOGICAL SURVEY FINDS THAT KNOWLEDGE OF WATER IMPACTS HAS NOT KEPT PACE WITH FRACKING TECHNOLOGY

A scientific Fact Sheet from the USGS concludes that “little is known about how a Marcellus Shale drilling boom might adversely affect the land, streams, and available water supplies in the Appalachian Basin.” This fact sheet discusses water resource concerns related to Marcellus Shale gas production; specifically: water consumption issues; transporting water and contaminated wastewater; and wastewater disposal.

USGS Fact Sheet: <http://md.water.usgs.gov/publications/fs-2009-3032/fs-2009-3032.pdf>

See also md.water.usgs.gov/publications/fs-2009-3032

MANHATTAN BOROUGH PRESIDENT RELEASES *UNCALCULATED RISKS*

Manhattan Borough President Scott Stringer released a landmark report in February 2009 entitled *Uncalculated Risks: How Plans to Drill for Gas in Upstate New York could threaten New York City’s Water System*. The report details environmental impacts from hydraulic fracturing operations nationwide.

Read the report here: <http://mbpo.org/uploads/UncalculatedRisk.pdf>

INDUSTRY STUDY ALLEGES DRILLING DID NOT CONTAMINATE RIVER

A gas industry funded study into the Total Dissolved Solids (TDS) problem in Pennsylvania alleges that industrial gas development did not have a great impact on elevated levels of TDS in the Monongahela River last fall. Instead, the study pins the blame on abandoned mine discharge and claims that drilling activity is less than one percent responsible for the total TDS concentration.

See <http://news.prnewswire.com/DisplayReleaseContent.aspx?ACCT=104&STORY=/www/story/05-20-2009/0005030265&EDATE=>

NY COMMISSION RECOMMENDS LEASING STATE-OWNED LAND FOR DRILLING

The New York State Commission on State Asset Maximization, chaired by former State Comptroller H. Carl McCall, recommended leasing state-owned land in the Marcellus Shale region for natural gas wells. The report was released on June 1, 2009. Read the full report at

<http://www.nysamcommission.org>

See <http://www.timesunion.com/AspStories/story.asp?storyID=806051&category=REGIO>

SEQRA Review Update

GAS DRILLING COULD RAISE THE COST OF NEW YORK CITY WATER

In comments to the draft scoping document, New York City Comptroller William Thompson warned the NY Department of Environmental Conservation that drilling in or near the New York City Watershed could degrade water quality enough to force the U.S. EPA to revoke its filtration avoidance determination (FAD). This would result in a 30 percent increase in City water rates should the City be forced to build a filtration plant. The FAD allows the City to avoid building a new \$10 billion water filtration plant to filter City water, in exchange for strong watershed protection programs.

See http://www.comptroller.nyc.gov/press/2008_releases/pr08-12-182.shtm

See also <http://www.propublica.org/article/new-york-city-calls-gas-drilling-effects-crippling-1216>

ALBANY TIMES UNION CALLS FOR SEQRA REVIEW TO PROCEED SLOWLY

In an April 28, 2009 editorial, the Albany Times Union again cautioned the State to proceed slowly with its review of environmental impacts of hydraulic fracturing. In particular, the Times Union editorial board cited concerns of this process causing methane to contaminate drinking water supplies.

See <http://www.timesunion.com/AspStories/story.asp?storyID=794600&category=MONEDIT>

Read Riverkeeper's Letter to the Editor in response:

<http://www.timesunion.com/AspStories/story.asp?storyID=800800&category=LETTER&BCCode=OPINION&newsdate=5/18/2009>

NEW YORK DEC RELEASES FINAL SCOPE FOR SEQRA REVIEW

On February 6, 2009 the New York State Department of Environmental Conservation released its final scope for the forthcoming draft supplemental generic environmental impact statement (DGEIS). Riverkeeper and its environmental partners help shape this final scope. We expect the DEC to issue the DGEIS in late July or early August 2009.

Read the final scope: http://www.dec.ny.gov/docs/materials_minerals_pdf/finalscope.pdf