

# **Municipalities that have Sought to Ban or Significantly Restrict Natural Gas Drilling: Who, How & Why**

**A Report prepared for the Butler Township, PA  
Marcellus Shale Advisory Board**

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*“The most difficult thing in the world to do is to try to convince a man that something is true if his livelihood depends on it not being true.”*

*- Mark Twain*

# Table of Contents

Introduction to the Online Version of This Report ( <i>March 2013</i> ) . . . . .	5
Preface: Act 13 . . . . .	7
Introduction . . . . .	8
Part I: Who and How? . . . . .	9
Part II: Why? . . . . .	12
<i>General Statements</i> . . . . .	<b>12</b>
<i>Toxic Chemicals</i> . . . . .	<b>15</b>
<i>Human Health Impacts</i> . . . . .	<b>16</b>
<i>Health Effects on Pets,     Livestock and Wildlife</i> . . . . .	<b>21</b>
<i>Dissatisfaction with Regulatory Agencies</i> . . . . .	<b>24</b>
<i>Non-disclosure Agreements</i> . . . . .	<b>29</b>
<i>Residential/Urban/Suburban Drilling;     Proximity of Drilling to Vulnerable Populations</i> . . . . .	<b>31</b>
<i>Well Density and Accompanying Infrastructure</i> . . . . .	<b>33</b>
<i>Decrease in Property Values; Gas Lease Issues</i> . . . . .	<b>36</b>
<i>Accidents, Spills, Blowouts and Fires</i> . . . . .	<b>40</b>
<i>Environmental/Safety Violations</i> . . . . .	<b>43</b>
<i>Ground-water Contamination</i> . . . . .	<b>45</b>
<i>Toxic Air Emissions</i> . . . . .	<b>48</b>
<i>Toxic Waste-water Disposal</i> . . . . .	<b>51</b>
<i>Seismic Activity</i> . . . . .	<b>52</b>
<i>Long-Term Environmental Effects</i> . . . . .	<b>53</b>
<i>“Sustainable” Shale</i> . . . . .	<b>54</b>
<i>Videos</i> . . . . .	<b>56</b>
Part III: Further Considerations . . . . .	57
<i>Sociological Impacts</i> . . . . .	<b>57</b>
<i>Human Rights</i> . . . . .	<b>58</b>
<i>Economic Considerations</i> . . . . .	<b>60</b>
<i>Legal Concerns</i> . . . . .	<b>62</b>
Part IV: Final Statements and Recommendations . . . . .	64
UPDATE: Butler Township and Drilling Bans.....	66
Why I Resigned from the Marcellus Shale Advisory Board.....	67
Future Updates of This Report.....	68

*“Horizontal and deep drilling activities involve greater risk of mechanical problems than vertical and shallow drilling operations.”*

*- Chesapeake Energy 10-K form*

# Introduction to the Online Version of This Report (March 2013)

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This is a report about those local, state, provincial and (in Europe) federal governments who have banned, set moratoriums upon, or sought to significantly restrict the unconventional shale-gas drilling industry. It is about how they set about doing this – the methods which failed and the methods which have succeeded. But mostly, it is about *why* these governments went about taking this admittedly risky action – why they turned away from considerable amounts of revenue for their municipalities/states/provinces/nations: because they believed that unconventional shale-gas drilling posed a **considerable risk** to the health and safety of the citizens living within their jurisdictions.

I compiled this report while I was a member of the Butler Twp. (Butler Co., PA) Marcellus Shale Advisory Board (Aug. 25, 2011–Mar. 19, 2012). When I resigned from said board a year ago, I gave a copy of this report to the Butler Twp. Board of Commissioners. At the end of this report I make three recommendations, the last of which is: “I recommend that this report be made **public**, so that township residents can have a greater awareness of the hazards and issues associated with hydraulic fracturing for shale gas extraction and so might be compelled to share their thoughts on this matter with the board of commissioners.”

To the best of my knowledge this has not been done, or at least not in any form that has the **visibility** which I feel this report merits. So that is one reason why I am publishing this report online: to give it the local visibility it deserves. (I plan a letter to the local newspaper announcing its launch.)

Another reason is to attempt to balance the local “shale-gas forums” and “advisory councils” sponsored by the industry whose sole purpose, along with the slick TV ads on local stations, is to convince the population that everything is “just fine and dandy” with shale-gas drilling – “no problems here, just sit back, deposit your royalty checks, spend your impact fees and watch the local economy boom; that is the **only** significant impact that our drilling will be having on your community...” The **table of contents alone** of this report

lists at least **19 separate categories** of issues connected to unconventional shale-gas drilling and its associated processes and infrastructure. The gas industry’s claims of “no problems here” may be found to be highly exaggerated...

Many people in my community live in a rosy, money-in-the-bank bubble regarding shale-gas drilling; I have little hope of bursting that bubble with this report. Still others live in a “there’s nothing you can do about it” state of apathy; this report may or may not be enough to light a fire under them.

This report, then, is mainly for those who maybe just need a little **nudge** of information to get “fired up.” It is also for all the people “crazy” enough to believe that there is something *toxically wrong* with shale-gas drilling, to give them the information necessary for them to believe that maybe they aren’t **quite** so crazy, to give them good reasons that justify their concerns, to encourage them in the endeavor of their activism.

I believe there’s no way of knowing how this drama will unfold – what one act, large or small, may tip the balance or trigger a **landslide** among all the disparate defiant groups and individuals of the world, within the governments of the world or within the **earth itself** that will in some way yield a decisive outcome. All I know is that to do **nothing** is to invite **nothing** to happen... Every thought and act, however seemingly “small,” creates an effect. Whether one is praying for health and safety in the midst of the shalefields, writing to the President of the United States about the dangers of fracking or enacting a community-rights ban on drilling in one’s community, it **all matters**.

Don’t let anyone ever tell you it doesn’t.

*“The economic benefit of this development is unquestionable. However, it is also unquestionable that when left unattended, the negatives outweigh the positives quickly and heavily.”*

*--Bradford County (PA) Commissioner Mark W. Smith*

# Preface: Act 13

In February 2012, the Pennsylvania General Assembly passed House Bill (HB) 1950, later known as Act 13. Essentially this legislative bill is a massive overhauling of the state's 1984 Oil and Gas Act. Among its many provisions are severe restrictions as to how a municipality may regulate the oil and gas industry through zoning. To the extent that this bill restricts Butler Township's capacity to zone for natural gas drilling, relegating such decisions to the state Public Utilities Commission, it has also single-handedly nullified the mission and purpose of the Butler Township Marcellus Shale Advisory Board.

One could also argue that the passage of HB 1950/Act 13 has nullified the relevance of this report. I respectfully disagree. The information contained in this report is information not readily available to Butler Township commissioners through local media and industry sources. One might contend: "What good is that information if the commissioners are not free to act upon it?" To which I would respond: "In life there are always choices. Not always easy, pleasant or comfortable choices, but there are choices..."

One of the main topics of this report is the communities in Pennsylvania and elsewhere who have banned natural gas drilling and, most importantly, **why** they have banned this practice. Many of these communities have instituted a drilling ban via a **community-rights ordinance** written for them by the Community Environmental Legal Defense Fund (CELDF). Of Act 13, CELDF had this to say:

*"Over the past several years, we've assisted the City of Pittsburgh and other municipalities across Pennsylvania to adopt local ordinances that create a "bill of rights" for those communities. Further, the ordinances ban State-permitted harms – including gas drilling – that violate those local bills of rights.*

*These ordinances advance a realization that is new to many people – that communities cannot ban activities that are harmful to us so long as we accept the State's authority to*

*strip us of community self-government. Thus, these bans have to be more than bans – they have to refuse to follow State law – because following State law automatically means that we lose control of the very future of our townships and boroughs, and consign them to environmental and community destruction.*

*For the community-rights ordinances, the passage of Act 13 doesn't change a thing. The ordinances have always stood as a frontal challenge to the authority of the State to override local control, and they continue to do so under any new legal framework that the State chooses to construct." (<http://celdf.org/section.php?id=325%E2%80%9D>)*

These concepts are admittedly quite radical, and I really don't expect the Butler Township Board of Commissioners to be interested in pursuing them. Then again, should this report be compelling enough to stir the commissioners to want to take action, if the risk of action should become less threatening and more palatable than the risk of inaction, I would like to present them with an option for action, so that they may defend township residents' "right to clean air, pure water, and to the preservation of the natural, scenic, historic and aesthetic values of the environment," as is stated in Article 1, Section 27 of the Pennsylvania Constitution. ([http://sites.state.pa.us/PA\\_Constitution.html](http://sites.state.pa.us/PA_Constitution.html)) This is the value of this report.

If nothing else, this report will render the township's decision not to act an informed decision.

# Introduction

Hydraulic fracturing has been used for over 60 years by the natural gas industry to extract natural gas from subterranean rock formations. However, in the past 10-15 years, hydraulic fracturing technology has undergone significant changes as the industry has sought ways of extracting natural gas from deep, non-porous shale deposits. This has given birth to what is called “*unconventional*” natural gas extraction, using a process referred to as “*high-volume slickwater hydraulic fracturing*.”

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The most significant change in this new process is **horizontal drilling**. After drilling vertically down to the shale layer, the drill is then turned and continues horizontally for up to a mile. Also different from conventional drilling is the higher volume of water that is mixed with sand and various chemicals and injected into the well-bore under high pressure to create the fractures in the shale. In “slickwater” hydraulic fracturing, a different mix of chemicals is used than in older methods of fracturing, reducing the amount of gelling agents and adding friction reducers – thus the term “slick.” A number of the chemical compounds used in current methods of hydraulic fracturing have been found to be toxic. Finally, the high pressure used in the current process creates a phenomenon called “flowback,” in which much of the chemically-laced water that is injected into the well flows back under pressure to the surface, often carrying with it naturally-occurring toxins from the shale layer in addition to the toxic chemicals originally present in the fracturing fluid. This toxic waste-water must be stored on-site until it can be recycled or transported to a disposal facility, such as a deep-injection well.

For reasons still not completely understood, the introduction of this new gas-extraction technology to the American (and global) landscape **has resulted**

in a number of problems that were not present with **conventional natural gas drilling**. The problems have ranged from cases of ground-water aquifer contamination to consistent patterns of illness in gas-drilling areas. Every few months it seems that new issues are emerging – e.g., seismic activity that has been attributed to hydraulic fracturing and the discovery of potential conflicts between gas leases, home mortgages and homeowners’ insurance.

The plethora of issues surrounding the current method of hydraulic fracturing has compelled a number of municipal, state and federal governments to seek either to ban the process within their borders, to enact moratoriums until further studies are done on the process, or to significantly restrict where that activity may occur in their communities. This report is about those communities and governments and the measures they have taken to ban, postpone or restrict high-volume hydraulic fracturing. More importantly, it is about *why* they have taken such actions. And – an important aspect to our township commissioners – it is about the *outcome* of such actions: whether they were successful, and at what cost.



# Part I: Who and How?

The municipalities cited in this report by no means comprise an exhaustive list of the communities that have tried to ban or regulate the gas industry, and high-volume hydraulic fracturing in particular. It will hopefully be a sufficient sampling to show the township commissioners which strategies have been successful and which have failed.

## Restrictive Zoning Ordinances = Law Suit

South Fayette Township and Cecil Township in Washington County and Penn Township in Butler County are examples of Pennsylvania municipalities that have attempted to impose significant restrictions on natural gas extraction, either through zoning ordinances or conditional use applications. In all three cases, the municipalities were sued by gas companies seeking greater access to properties within the townships. (<http://www.post-gazette.com/stories/local/marcellusshale/small-community-of-south-fayette-focus-of-big-marcellus-shale-controversy-320457/>) (<http://canon-mcmillan.patch.com/articles/range-resources-files-suit-over-cecil-ordinance>) (<http://www.butlereagle.com/article/20110413/NEWS01/704139858/0/SEARCH>)

## Drilling Ban Based on State Law = Law Suit

Morgantown, WV sought a complete ban on drilling within the city limits and also a mile beyond the city limits. That extra mile would encompass the city's municipal drinking water intake on the Monongahela River. The drilling ban ordinance which the city enacted was based on an interpretation of state law which their solicitor felt enabled them to take such action. The ordinance was enacted in June 2011; the city was sued by North East Energy in July 2011 due to the ban; in August 2011 the ban was struck down by a state judge. (<http://www.businessweek.com/ap/financialnews/D9O4DT700.htm>) (<http://wvgazette.com/News/marcellus/201108141328>)

In February 2012, two local bans on drilling in New York state, in the towns of Dryden and Middlefield, were upheld by the State Supreme Court. The Dryden ruling was the first ruling in New York on the issue of whether towns can outlaw gas drilling. **Dozens of towns and cities in New York have adopted drilling bans.** In the Middlefield case, acting state Supreme Court Justice Donald Cerio ruled that *"the authority vested in towns and cities in New York to regulate use of their land extends to prohibitions on drilling,"* dismissing arguments by a landowner who had already sold leases on almost 400 acres. These bans were not community-rights bans. The New York lawsuits are probably irrelevant in the face of Pennsylvania's Act 13, but are included to show what is being done in other places re: natural gas drilling. ([http://www.nytimes.com/2012/02/22/nyregion/town-can-ban-hydrofracking-ny-judge-rules.html?\\_r=3&](http://www.nytimes.com/2012/02/22/nyregion/town-can-ban-hydrofracking-ny-judge-rules.html?_r=3&)) (<http://www.reuters.com/article/2012/02/26/us-usa-newyork-fracking-idUSTRE81P01820120226?rpc=401&feedType=RSS&feedName=domesticNews&rpc=401>)

## Moratorium = Temporary Stop

New York State, Maryland, New Jersey, and the province of Quebec have all placed moratoriums on natural gas drilling until thorough environmental impact studies of hydraulic fracturing could be completed. Pennsylvania has never required such a study. New York State is in the process of lifting their moratorium, amid considerable controversy. And in January 2012, a Vermont House of Representatives water resources committee unanimously approved a bill imposing a **three-year moratorium** on hydraulic fracturing anywhere in the state. The bill also directs the state Agency of Natural Resources to come back to lawmakers in 2015 with a study assessing the risks and safety record of the industry. (UPDATE: In April 2012, the state of Vermont banned hydraulic fracturing)

(<http://www.reuters.com/article/2010/11/30/us-energy-naturalgas-newyork-idUSTRE6AT39720101130>) (<http://thedailyrecord.com/2012/09/09/a-bid-to-keep-fracking-on-hold/>) ([http://www.huffingtonpost.com/2011/08/25/chris-christie-fracking-ban\\_n\\_936822.html](http://www.huffingtonpost.com/2011/08/25/chris-christie-fracking-ban_n_936822.html)) ([http://business.financialpost.com/2012/09/20/quebec-hints-at-long-term-shale-gas-ban-citing-ecological-risks/?\\_\\_lsa=5fe9-f471](http://business.financialpost.com/2012/09/20/quebec-hints-at-long-term-shale-gas-ban-citing-ecological-risks/?__lsa=5fe9-f471)) (<http://www.cnn.com/2012/05/17/us/vermont-fracking/index.html>)

## Community Rights Ordinance = Effective Drilling Ban

The cities of Pittsburgh, Wilkesburg and West Homestead as well as Baldwin Boro and Forest Hills, all in Allegheny County, the village of Mountain Park Lake, MD and the Town of Wales, NY have all enacted “community rights” ordinances that ban natural gas drilling within their borders. A community rights ordinance contains within it a Bill of Rights conferring upon community residents the right to “clean air, pure water and the peaceful enjoyment of their homes.” It also places the rights of community residents above the rights of corporations. These ordinances were drawn up by the Community Environmental Legal Defense Fund (CELDF), headquartered in the Chambersburg PA area. CELDF works with municipalities that want to say “no” to industrial developments they deem unhealthy, and will draw up a community-rights ordinance for a municipality free of charge. If a municipality is sued over a CELDF ordinance, they will draw up the legal defense for said ordinance free of charge. To date, no municipality that has banned drilling via a community rights ordinance has been sued by the gas industry. Samples of community rights ordinances are included in this report. (<http://www.celdf.org/section.php?id=39>) (<http://www.post-gazette.com/stories/local/neighborhoods-city/city-oks-ban-on-gas-drilling-273511/>) (<http://pipeline.post-gazette.com/news/archives/23960-west-homestead-bans-gas-drilling>)

NOTE: In the enclosed Pittsburgh Post-Gazette article re: Pittsburgh’s drilling ban, a mention is made of the CELDF mining ban ordinance adopted by Blaine Township, Washington County in 2007 that was struck down by a federal court. It is important to note that this ordinance was not the same as the ordinance that is currently being passed by municipalities to ban natural gas drilling. The current ordinances incorporate some of the court decisions in the Blaine case and are built around an enforceable Bill of Rights that augments state and federal constitutional guarantees with the rights to clean air, clean water and self-government. For a detailed analysis of the difference

and the legal philosophy behind the community rights drilling ban ordinance, please refer to the article *The Opening Salvo* on page five of the CELDF publication *Common Sense*, included in this report. (<http://www.celdf.org/the-opening-salvo-blaine-township-washington-county-picks-a-fight-with-coal-corporations-in-western-pennsylvania->)

## Ballot Referendum = Effective Drilling Ban

Additionally, the borough of State College on Nov. 8, 2011 passed, by a 72% popular vote, a ballot referendum that amended the borough’s home rule charter with a CELDF Bill of Rights that banned drilling in the borough. This Bill of Rights also prohibits associated infrastructure such as compressor stations and pipelines from being constructed in the borough, makes it unlawful to store, transport or deposit waste-water, brine or other by-products of unconventional gas extraction in the borough, and holds neighboring municipalities, counties and states liable for any negative impacts from natural gas drilling that might affect the borough. This latter provision led the city of Pittsburgh to, on Nov. 14, 2011, introduce a “toxic trespass” ordinance written by CELDF to protect the city’s drinking water, which had previously been contaminated with bromides, a toxic drilling waste substance; it was passed by City Council on Dec. 20, 2011. Similar CELDF drilling ban ballot referendums were defeated at the polls in both the city of Warren PA and in Peters Township, Washington County. Both are home rule charter communities. In both cases, CELDF mounted successful legal defenses to make sure the referendums appeared on the ballots after the proper petitions were filed. In the case of Peters Township v. Peters Township Marcellus Shale Awareness (PTMSA, a citizens group who petitioned for the referendum), a pair of lawyers from the firm Healey and Hornack, P.C. in Pittsburgh tried the CELDF legal defense for PTMSA in court pro bono. (<http://www.celdf.org/celdf-press-release-state-college-voters-adopt-community-rights-charter-amendment-that-bans-gas-drilling>) (<http://www.celdf.org/celdf-press-release-pittsburgh-council-votes-to-ban-upstream-poisoning-of-city-residents-and-the-environment-caused-by-corporations-fracking-for-shale-gas>) (<http://www.celdf.org/pittsburghs-toxic-trespass-resulting-from-unconventional-natural-gas-drilling>) (<http://www.celdf.org/celdf-press-release-legal-defense-fund-prevails-over-warren-county-board-of-elections->)

(<http://www.rawstory.com/rs/2011/09/12/penn-township-challenges-fracking-with-ballot-initiative/>) (<http://www.celdf.org/celdf-press-release-peters-township-citizens-prevail-local-bill-of-rights-and-fracking-ban-to-appear-on-ballot>)

## Federal Ban

In addition to these state and local governments that have felt compelled to protect their residents from the perceived and actual hazards of unconventional natural gas drilling, the federal government of France has banned natural gas drilling via hydraulic fracturing. *“Development of hydrocarbon resources underground is strategic for our country but not at any price. This won’t be done until it has been shown that technologies used for development respect the environment, the complex nature of soil and water networks.”* (French president Nicolas Sarkozy) (<http://www.businessweek.com/news/2011-10-04/france-to-keep-fracking-ban-to-protect-environment-sarkozy-says.html>) (<http://www.businessweek.com/news/2012-08-29/france-to-keep-shale-ban-until-fracking-alternative-emerges>)

According to the *Associated Press*, on January 17, 2012, Bulgaria’s government, bowing to public pressure, said U.S. Oil company Chevron could not explore for shale gas in the country using *“the controversial technology of hydraulic fracturing.”* The following day, Bulgaria’s Parliament approved a total ban on hydraulic fracturing in Bulgaria and its Black Sea territorial waters. ([http://www.boston.com/cars/news/articles/2012/01/17/bulgaria\\_says\\_chevron\\_cannot\\_use\\_fracking/](http://www.boston.com/cars/news/articles/2012/01/17/bulgaria_says_chevron_cannot_use_fracking/))

## Other International Bans

According to a report in the Irish online publication *TheJournal.ie*, five Irish county governments have banned the hydraulic fracturing process. On January 17, 2012, Donegal and Sligo counties joined Clare, Leitrim and Roscommon counties in prohibiting the controversial process within their borders. (<http://www.thejournal.ie/donegal-and-sligo-become-latest-local-authorities-to-ban-fracking-329929-Jan2012/>)

## And finally... Just Say NO!

The Rockingham County, VA board of supervisors didn’t even vote on whether or not to allow the first Marcellus Shale gas well in Virginia to be drilled in their county. The board of four Republicans and one Democrat simply said “no,” and eventually the drilling company simply walked away. This was after Republican supervisor Pablo Cuevas investigated the company (Carrizo Oil and Gas) and Marcellus Shale drilling and found

that the “downside” didn’t justify the “upside.” *“At first, land-owners who granted leases to Carrizo in return for rent payments and royalties were upset with Cuevas. But after public hearings in which environmentalists and landowners in other states testified, their opinions slowly changed.”* Carrizo’s response to the board of supervisors just saying no: *“We tested the waters, and they’re not warm.”* (See the *Washington Post* article, *“With Deep Concerns Over Fracking, a Va. County Says No to More Gas Drilling.”*) ([http://www.washingtonpost.com/national/health-science/with-deep-concerns-over-fracking-a-va-county-says-no-to-more-gas-drilling/2012/01/27/gIQAxhUcsQ\\_story.html](http://www.washingtonpost.com/national/health-science/with-deep-concerns-over-fracking-a-va-county-says-no-to-more-gas-drilling/2012/01/27/gIQAxhUcsQ_story.html))

On March 5, 2012, Niagara Falls, NY, City Council Members unanimously passed two resolutions opposing hydraulic fracturing in the city and New York State, saying they wouldn’t make the same tragic environmental mistakes of the past. City Council members passed a city ordinance entitled *“Niagara’s Community Protection from Natural Gas Extraction Ordinance.”* The city ordinance bans hydraulic fracturing in Niagara Falls and the treatment of “fracking water” at the waste water treatment plant in the Falls. Niagara Falls Water Board and plant executives had pointed to the economic impact of trucking-in the fracking fluid from the Marcellus Shale, and treating the toxic fluid before releasing it into the Niagara River. Fracking companies have yet to release information to the public regarding the exact contents and effects of the treated water. *“It’s not worth millions of dollars to kill kids. You’re talking about putting it in people’s drinking water. People are worth more than millions of dollars— their individual lives,”* said City Council Chairman Sam Fruscione. *“So in my mind I’ll have a good conscience walking away thinking I did the right thing for the community and I didn’t sell out [for] money.”* *“I think people in Niagara Falls have a special sensitivity about long-term unanticipated environmental consequences because of our unfortunate experience with Love Canal,”* said Mayor of Niagara Falls, Paul A. Dyster. *“So I think people are very cautious here about anything that could potentially impact the environment.”* The Council also unanimously passed the resolution entitled *“Dangers of Hydraulic Fracturing in New York State.”* The resolution will soon reach Governor Cuomo’s desk in Albany. Tuesday afternoon the Buffalo Common Council will vote on a similar resolution to support a statewide ban, asking Governor Cuomo not to go forward. **In February 2011 Buffalo was the first city in New York State to pass legislation opposing fracking and fracking waste.** (<http://www.wgrz.com/news/article/159184/13/Niagara-Falls-Council-Votes-to-Ban-Hydrofracking>)

## Part II: Why?

### General Statements

I begin this section with a brief discussion of **The Precautionary Principle**. For a more detailed discussion of this legal/philosophical principle, please see the link to the online reference source Wikipedia.

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**The Precautionary Principle holds that, when a certain action is suspected of causing harm, it is up to those persons wishing to take said action to prove conclusively that the action causes no harm.**

The Precautionary Principle holds that, when a certain action is suspected of causing harm, **it is up to those persons wishing to take said action to prove conclusively that the action causes no harm.** For policy makers, *“the principle implies that there is a social responsibility to protect the public from exposure to harm,”* until such time when *“scientific findings emerge that provide sound evidence that no harm will result.”* Clearly, this is the guiding principle, however subconscious, behind those governments which have sought to control or prohibit natural gas drilling via high-volume hydraulic fracturing, at least until a thorough study of the process is completed. ([http://en.wikipedia.org/wiki/Precautionary\\_principle](http://en.wikipedia.org/wiki/Precautionary_principle))

- I have included in this part of the report a copy of a **letter written by Bradford County Commissioner Mark W. Smith to PA Gov. Tom Corbett in April 2011**, detailing the negative impacts of Marcellus Shale drilling on communities in his county. A pertinent quote from this letter was included at the beginning of this report. While Bradford County has not sought to prohibit or restrict drilling, Commissioner Smith is in a unique position to report on conditions that have caused others to seek to ban or regulate industry activities, being an elected official of the most drilled-in county in Pennsylvania. (<http://www.bradfordcountypa.org/images/PDFs/Press-Releases/Bradford-County-Natural-Gas-Concerns.pdf>)
- Two of the stated objectives for this aspect of advisory board inquiry were *“to interview individuals and municipalities that are seeking to prohibit or have prohibited drilling and to determine the basis for either their decision to prohibit drilling or why they believe prohibiting drilling is warranted.”* To this end, I conducted an **e-mail interview with Pittsburgh City Councilman Doug Shields** re: why he and his colleagues voted unanimously to ban drilling within the city limits (answers submitted 10/6/11). I have included segments of this interview as part of this report. I have also tried to verify as much of the *“basis for their decision”* as I could in this report. Statements from other municipal officials whose communities have banned drilling can be found in the included articles and press releases that announced their bans.
- Before **Morgantown WV** city officials voted to ban drilling in their city, they had requested a stop-work order from the WVDEP pertaining to drilling and hydraulic fracturing in the area. An enclosed copy of that request lists numerous reasons why the city wanted drilling halted. ([http://www.uppermon.org/Mon\\_Watershed\\_Group/](http://www.uppermon.org/Mon_Watershed_Group/)), (minutes from June 2 public meeting, pgs. 19-20.)

- **Scientific American** has published an article, *Safety First, Fracking Second: Drilling for Natural Gas Has Gotten Ahead of the Science Needed to Prove It Safe*. (<http://www.scientificamerican.com/article.cfm?id=safety-first-fracking-second>)
- **Environmental Defense Fund** president **Fred Krupp** has written an editorial in the EDF publication *Solutions* about his experience on the federal energy panel investigating hydraulic fracturing and the need to “get tough on fracking.” An article about the federal panel’s report and its recommendations was also published in *Solutions*. The report cites “*dangerous air pollution levels, contamination of ground and surface water, devastated rural areas, the uncontrolled release of large amounts of methane and unsafe disposal of waste—water and chemical additives.*” Recommendations include “*substantially cutting emissions of methane, airborne toxins and pollutants and managing cumulative impacts on communities, land use, wildlife and ecosystems.*” (<http://solutions.edf.org/2011/09/27/why-i-serve-on-obamas-gas-commission/>) (<http://solutions.edf.org/2011/09/27/cleaning-up-the-fracking-mess/>)
- *In the Shadow of the Marcellus Boom* is a report prepared by **PennEnvironment Research and Policy Center** that details the pollution risks of Marcellus Shale gas extraction to Pennsylvania’s air and water, the health and safety impacts associated with gas extraction activity, especially with regard to children and the elderly, and the gaps in state and federal policy regarding hydraulic fracturing. (<http://www.pennenvironment.org/reports/pae/shadow-marcellus-boom>)
- *Natural Gas Industry Rhetoric Versus Reality* is an unfortunately useful text that places oft-repeated gas industry statements within the context of government reports, scientific studies and expert analysis that reveal the realities behind the semantics. Included in this text is a statement from the **Council of Scientific Society Presidents** that natural gas derived from the hydraulic fracturing of shale is “*another area where policy has preceded adequate scientific study.*” (<http://www.desmogblog.com/natural-gas-industry-rhetoric-versus-reality>)
- *Old and New Hydraulic Fracturing: What’s the Difference?* details the greater amounts of water, chemicals (many of which are toxic to humans and wildlife), toxic waste, truck traffic, drill cuttings requiring disposal and greater industrialization of the landscape present with “new” high-volume hydraulic fracturing as opposed to the “old” hydraulic fracturing used in conventional gas wells. ([http://www.pressaction.com/news/weblog/full\\_article/oldnewfracking06202011/](http://www.pressaction.com/news/weblog/full_article/oldnewfracking06202011/))
- Since at least 1996, **Chesapeake Energy’s 10-K forms** have conceded “*horizontal and deep drilling activities involve greater risk of mechanical problems than vertical and shallow drilling operations.*” The documents did not specify what the problems might be. (*Drilling Doublespeak*, **Environmental Working Group**) ([http://static.ewg.org/pdf/Drilling\\_Doublespeak.pdf](http://static.ewg.org/pdf/Drilling_Doublespeak.pdf))
- In the wake of recent proposed legislation in the **PA General Assembly** that would restrict municipalities’ abilities to zone natural gas drilling, I contacted **CELDF** representative **Eric Belcastro** to ask him how this new legislation might affect **CELDF** community-rights ordinances. His primary response was: “*The bills currently being considered do not effect CELDF’s legislation, which does not zone or regulate. One would have as easy of a time arguing that the Declaration of Independence is a zoning ordinance.*”
- A recent **United Nations General Assembly** document (*Document A/HRC/18/NGO/91*, distributed Sept. 19, 2011) informs the U.N. Human Rights Council that the environmental damage caused by hydraulic fracturing for natural gas poses “*a new threat to human rights.*” This document contains the following statement: “*Fracking poses unacceptable risks and should be banned globally. The United States can better provide national energy security through aggressively pursuing energy efficiency and renewable technology, not supporting the toxic extraction of shale gas. Every dollar spent on fracking is a dollar not spent pursuing renewable energy solutions that must eventually be adopted to counter global warming. Other states should heed the environmental destruction that fracking has caused in the U.S. and ban the practice before it begins.*” (The document *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas*, prepared by the organization **Environment and Human Rights Advisory [EHRA]** for the **New York State Dept. of Environmental Conservation** [Dec. 12, 2011], will be discussed in detail later in this report.) (<http://documents-dds-ny.un.org/doc/UNDOC/GEN/G11/160/72/pdf/G1116072.pdf?OpenElement>) ([http://www.earthworksaction.org/files/publications/EHRA\\_Human-rights-fracking-FINAL.pdf](http://www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf))

- The Rev. Canon Jeff Golliher is vicar of St. John's Episcopal Church in Ellenville, NY and environmental representative of the worldwide Anglican Communion to the United Nations. In his thoughtful essay *"Why I'm Opposed to Fracking,"* courtesy of the Episcopal News Service, he calls upon his traditional southern Appalachian upbringing and the simple sage advice of his great-grandfather Joel: *"Don't poison the well!"* Further, he writes: *"Jobs, yes — we all need work — but not at the expense of everything that really matters in life. The poisoning of groundwater, whether intentional or unintentional, is not something that any reasonable, ethical, thoughtful person would ever contemplate — not under any conceivable circumstance."* (<http://episcopaldigitalnetwork.com/ens/2012/01/31/why-im-opposed-to-fracking/>)
- A January 2012 feature report in Fort Worth Weekly, *"Don't Drink the Water,"* focuses primarily on the EPA's Pavillion WY water contamination investigation, but it touches upon numerous other issues associated with hydraulic fracturing for natural gas, from earthquakes and human health impacts to non-disclosure agreements. (<http://www.fwweekly.com/2012/01/25/dont-drink-the-water/>)
- A Feb. 2012 PennEnvironment Research and Policy Center report (*"Risky Business: An Analysis of Marcellus Shale Gas Drilling Violations in Pennsylvania 2008-2011"*) states *"a need for state leaders to halt additional shale gas extraction through all legally viable means until and unless gas operators can prove the practice is safe for the environment and public health."* (<http://pennenvironmentcenter.org/reports/pac/risky-business-analysis-marcellus-shale-gas-drilling-violations-pennsylvania-2008-2011>)
- While natural gas is touted as a "clean-burning energy fuel," many scientists have expressed concerns about the levels of pollution generated by its extraction via hydraulic fracturing (see the Scientific American article *"Fracking Would Emit Large Quantities of Greenhouse Gases"* and the Cornell University study *"Venting and Leaking of Methane from Shale Gas Development."*) In Feb. 2012, Sierra Club Executive Director Michael Brune wrote in his statement *"The Sierra Club and Natural Gas:"* *"It's time to stop thinking of natural gas as a 'kinder, gentler' energy source. What's more, we do not have an effective regulatory system in this country to address the risks that gas drilling poses on our health and communities. The scope of the problems from under-regulated drilling, as well as a clearer understanding of the total carbon pollution that results from both drilling and burning gas, have made it plain that, as we phase out coal, we need to leapfrog over gas whenever possible in favor of truly clean energy. Instead of rushing to see how quickly we can extract natural gas, we should be focusing on how to be sure we are using less -- and safeguarding our health and environment in the meantime."* (<http://www.scientificamerican.com/article.cfm?id=fracking-would-emit-methane>) (<http://sierraclub.typepad.com/michaelbrune/2012/02/the-sierra-club-and-natural-gas.html>) ([http://www.eeb.cornell.edu/howarth/Howartheta2012\\_Final.pdf](http://www.eeb.cornell.edu/howarth/Howartheta2012_Final.pdf))
- And finally, a statement about the risks and hazards of hydraulic fracturing and drilling from the industry itself. According to the 2010 Form 10-Ks of Chesapeake Energy and Range Resources (both doing business in the Marcellus Shale region), natural gas operations are *"subject to many risks, including well blow-outs, craterings, explosions, pipe failures, fires, uncontrollable flows of natural gas or well fluids, formations with abnormal pressures and other environmental hazards and risks."* Drilling operations, according to Chesapeake, involve risks from high pressure and mechanical difficulties such as stuck pipes, collapsed casings and separated cables. If any of these hazards occur it can result in injury or loss of life, severe damage or destruction of property, natural resources and equipment, pollution or other environmental damage and clean-up responsibilities, all in the homeowner's backyard. *"Under federal law, oil and gas companies must offer investors and federal regulators detailed descriptions of the most serious environmental and other risks related to drilling. But leases typically lack any mention of such risks."* The above statements are from the supporting documents *Homeowners and Gas Leases: Boon or Bust?* published in the New York State Bar Association Journal, and *Learning Too Late of the Perils in Gas Well Leases* from the New York Times, both listed in the "Property Values" section of this report. (<http://www.nysba.org/AM/Template.cfm?Section=Home&ContentID=57132&Template=/CM/ContentDisplay.cfm>) (<http://www.nytimes.com/2011/12/02/us/drilling-down-fighting-over-oil-and-gas-well-leases.html?pagewanted=all>)

# Toxic Chemicals

One of the more controversial aspects of hydraulic fracturing is the amount and toxicity of the chemicals used in the process.

**“While these chemicals typically compose less than 0.5% by volume of the hydraulic fracturing fluid, with a three million gallon fresh water consumption rate per well per day, this could result in approximately 15,000 gallons of these chemicals being transported, stored and mixed on one well site per day.”**

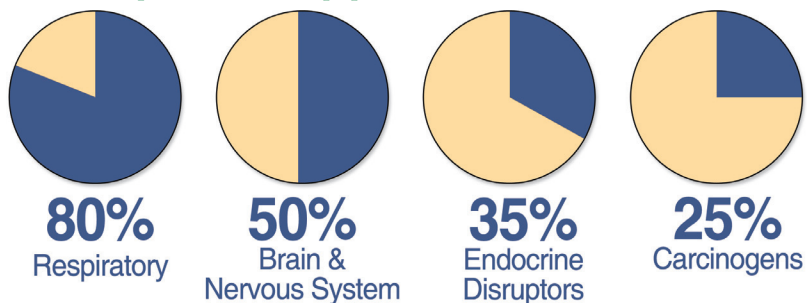
- *Playing for Keeps Along the Susquehanna* by Dr. Simona L. Perry is a study of the impacts of Marcellus Shale drilling on both the communities and the environment of Bradford County PA and is worthwhile reading. Its inclusion in this report is primarily for the statement on pgs. 3-4 about the amount of chemicals used in high-volume hydraulic fracturing, which places in proper context the oft-repeated industry statement about the “small amount” of chemicals used: “*While these chemicals typically compose less than 0.5% by volume of the hydraulic fracturing fluid, with a three million gallon fresh water consumption rate per well per day, this could result in approximately 15,000 gallons of these chemicals being transported, stored and mixed on one well site per day.*” Statements about the amount of chemicals used can also be found in the article **Old and New Hydraulic Fracturing: What’s the Difference?** ([http://catskillcitizens.org/learnmore/PerryPostDoc\\_FINALREPORT\\_July2011.pdf](http://catskillcitizens.org/learnmore/PerryPostDoc_FINALREPORT_July2011.pdf)) ([http://www.pressaction.com/news/weblog/full\\_article/oldnewfracking06202011/](http://www.pressaction.com/news/weblog/full_article/oldnewfracking06202011/))
- *Chemicals Used in Hydraulic Fracturing* is a study that was commissioned by the U.S. House of Representatives. The study shows that, while harmless, commonplace ingredients touted by the industry are present in hydraulic fracturing fluid, there are many frequently-used chemical compounds that have been found to be *toxic* or *carcinogenic*. The study further notes that these toxins and carcinogens associated with natural gas production can be *both airborne and water-borne* and their presence has been noted *in various contamination incidents linked to drilling*. (<http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic-Fracturing-Chemicals-2011-4-18.pdf>)
- Hydrogen sulfide (H<sub>2</sub>S) is a particular potent airborne toxin associated with natural gas activity. Studies reveal that it is present near gas wells, tank batteries, gas processing plants, flares and compressor stations. Common symptoms of exposure to long-term low levels of hydrogen sulfide include headaches, skin complications, respiratory irritation, damage and degeneration, confusion, impairment of verbal recall, memory loss and prolonged reaction time. Exposure to high concentrations can cause unconsciousness and can be fatal. ([http://www.earthworksaction.org/issues/detail/hydrogen\\_sulfide#.UL2U4KAS8pZ](http://www.earthworksaction.org/issues/detail/hydrogen_sulfide#.UL2U4KAS8pZ))
- Spills, leaks, malfunctions or build-up of hydrogen sulfide can result in dangerously high and sometimes lethal levels. Recently the U.S. Environmental Protection Agency rescinded a 17-year exemption and now requires the oil and gas industry to report all releases of hydrogen sulfide. Hydrogen sulfide was at the heart of a recent investigation in Colorado, in which state regulators were accused of misleading the public concerning the release of H<sub>2</sub>S at several Noble Energy natural gas wells in western Colorado. The gas industry had discounted and fought air studies in western Colorado that had turned up hydrogen sulfide readings, but after a local TV station’s investigation of the matter, Noble Energy admitted the presence of H<sub>2</sub>S at the majority of their wells in the area. (<http://washingtonindependent.com/115649/epa-will-require-oil-and-gas-companies-to-disclose-release-of-hydrogen-sulfide>) (<http://coloradoindependent.com/99766/hot-topic-of-hydrogen-sulfide-emissions-creates-cloud-of-controversy-in-gas-patch>) (<http://www.krextv.com/news/around-the-region/NC5-INVESTIGATION-Deadly-Gas-Cover-Up-Revealed-126869973.html>)

# Human Health Impacts

As has been shown previously, the chemical compounds used and released by hydraulic fracturing for natural gas and its associated infrastructure can have a detrimental health impact on communities within the vicinity of this activity. The following are more in-depth studies and reports of the health issues accompanying shale gas extraction.

**“Children are more vulnerable to environmental hazards. [They] are not able to metabolize some toxicants as well as adults due to immature detoxification processes. Moreover, the fetus and young child are in a critical period of development when toxic exposures can have profound negative effects.”**

- The essay *Fracking, Shale Gas and Health: A Case for Precaution*, printed in the Canadian publication **Prevent Cancer Now**, is a comprehensive overview of shale gas health impacts that references many of the health studies included in this report. (<http://preventcancer.ca/health-impacts-of-fracking-and-shale-gas-development>)
- Pediatric Environmental Health Speciality Units (PEHSU), a national pediatricians’ group, has issued warnings about health risks to children associated with natural gas extraction. These include risks from water contamination, air pollution, and also “noise pollution”, which “might impact sleep, and that has been associated with negative impacts on learning and other aspects of daily living.” The study states that “children are more vulnerable to environmental hazards. [They] are not able to metabolize some toxicants as well as adults due to immature detoxification processes. Moreover, the fetus and young child are in a critical period of development when toxic exposures can have profound negative effects.” ([http://aoec.org/pehsu/documents/hydraulic\\_fracturing\\_and\\_children\\_2011\\_health\\_prof.pdf](http://aoec.org/pehsu/documents/hydraulic_fracturing_and_children_2011_health_prof.pdf))
- The Endocrine Disruption Exchange (TDEX), a professional healthcare organization spearheaded by Dr. Theo Colborn, has produced a study, *Natural Gas Operations from a Public Health Perspective, that details the effects of airborne and water-borne pollutants associated with natural gas production on the human endocrine system and other bodily functions*. Of the 353 chemicals (not a complete list) identified in fracking fluid by Chemical Abstract Service (CAS) number (a number that categorizes toxicity), over 80% have respiratory effects, 50% have brain and nervous system effects, more than 25% are carcinogenic and over 35% are endocrine disruptors. Complete study enclosed; study includes graphs profiling possible health effects (see graph below). (<http://www.endocrinedisruption.com/home.php>)





- The U.S. Agency for Toxic Substances and Diseases Registry (ATSDR) received a request for a “health consultation” from the EPA in the wake of the latter agency’s investigation of impacts from a well blow-out in Leroy Township, Bradford County PA in April 2011. ATSDR reports that “*the available environmental data and information do not conclusively indicate but suggest that the groundwater near this site is impacted by natural gas activities.*” Of the seven area drinking wells tested, two were found contaminated. One had a 10-fold increase in methane concentration accompanied by toxic chemicals; the other had unacceptable levels of arsenic. Treated or bottled water is being supplied to three of the seven residences; Chesapeake Energy is installing a whole house reverse osmosis treatment system to one of the residences. EPA and PADEP continue their investigations. ATSDR has made sweeping recommendations for future environmental assessment at natural gas hydraulic fracturing sites in the Marcellus Shale formation. Health consultation study is included in supporting documents. (<http://www.atsdr.cdc.gov/hac/pha/ChesapeakeATGASWellSite/ChesapeakeATGASWellSiteHC110411Final.pdf>)
- The ProPublica article *Science Lags As Health Problems Emerge Near Gas Fields* details the consistently similar reports of illness emerging in the wake of increased natural gas drilling in Wyoming, Colorado, Texas and Pennsylvania. Christopher Portier, director of the U.S. Agency for Toxic Substances and Diseases Registry (ATSDR) is quoted in the article as saying that the anecdotal evidence of environmental illness is sufficient to warrant a serious and systematic study. However, such a study could cost upward of \$100 million. “*We can’t do everything yet. We only have so much money available.*” (NOTE: The photo at the beginning of this article of the woman wearing an oxygen mask may seem sensationalistic; however, considering that this woman’s initial exposure to gas-field fumes rendered her unconscious, her precaution is perhaps

**Christopher Portier, director of the U.S. Agency for Toxic Substances and Diseases Registry (ATSDR) is quoted in the article as saying that the anecdotal evidence of environmental illness is sufficient to warrant a serious and systematic study.**

understandable.) (<http://www.propublica.org/article/science-lags-as-health-problems-emerge-near-gas-fields>)

- U.S. Senator Robert Casey (D-PA) has asked the EPA, the CDC (Centers for Disease Control and Prevention), the National Institute of Environmental Health Sciences and the PA Department of Health to investigate identified disease clusters in Pennsylvania, including a site in Washington County “*where residents are concerned that illnesses may be linked to natural gas drilling.*” (<http://www.casey.senate.gov/newsroom/press/release/?id=72eab1e9-a033-4ecd-b8b1-59cc5bd2c271>)

- In November 2011, the University of Pittsburgh Graduate School of Public Health hosted its 2nd annual conference on the *Health Effects of Shale Gas Extraction*. Purpose and agenda of

the conference included with this report. A report from Essential Public Radio.org speaks of the conference’s efforts in “expanding the dialog on the clinical effects that hydraulic fracturing has on residents and... laying the groundwork for evidence-based diagnoses.” (And since this report was initially conceived, the 3rd annual *Health Effects of Shale Gas Extraction* conference has been held.) (<http://www.shalegas.pitt.edu/index.php?q=node/3>)

- The Southwest Pennsylvania Environmental Health Project (SWPA-EHP) is a nonprofit environmental health organization that has been created to assist and support Washington County residents who believe their health has been, or could be, impacted by natural gas drilling activities. From the group’s website: “*SWPA-EHP has an onsite nurse practitioner who is available by appointment for home or office visits, exams and consultations with people who think their health may be compromised by nearby gas drilling activities. She will also provide referrals, help clients navigate the health care system and consult with environmental health specialists about residents’ medical conditions. The office also serves as a resource center for information on the potential routes of exposure to hazardous substances*

and strategies for limiting the risk of health effects from these exposures. Our staff will be available by appointment in the office and by phone to address concerns residents have about their environmental conditions. We will answer questions, provide guidance and steer people toward other resources when possible.” “At SWPA-EHP we are troubled by the uncertainty around what precisely Washington County residents are being exposed to. The scarcity of objective, reliable data on the health effects of gas extraction activities leaves open many questions about the origins of residents’ health problems and the scope of public health risks in communities. We do not, however, see this uncertainty as a cause for inaction. As public health professionals we know that the perception in the community of environmental dangers, along with plausible sources of hazardous substances, are reason enough to provide a public health response.” (<http://www.environmentalhealthproject.org/>)

- In October 2011, a group of over 250 New York State healthcare professionals sent a letter to NY Gov. Andrew Cuomo regarding the *health impacts of hydraulic fracturing*: “We are greatly concerned about the omission [in the state’s environmental impact study] of a critical issue related to the development of natural gas using high-volume hydraulic fracturing, or ‘fracking’: human health impacts... In December 2009, U.S. Environmental Protection Agency Region 2... called for ‘a greater emphasis... on the potential health impacts that may be associated with gas drilling and hydrofracturing’... There is a growing body of evidence on health impacts from industrial gas development. In Texas, Wyoming, Louisiana, North Dakota, Pennsylvania and other states, cases have been documented of worsening health among residents living in proximity to gas wells and infrastructure such as compressor stations and waste pits. Symptoms are wide-ranging, but are typical for exposure to the toxic

**“Thirty-seven percent of chemicals in fracking fluids have been identified as endocrine-disruptors. By definition, these substances have the power, at vanishingly low concentrations, to alter hormonal signaling pathways within the body. Many can place cells on the pathway to tumor formation.”**

chemicals and air and water pollutants used in oil and gas development and can often be traced to the onset of such operations.” (<http://www.slideshare.net/MarcellusDN/health-care-providers-letter-to-gov-andrew-cuomo-against-fracking?from=embed>)

- A Jan. 9, 2012 article in the Bloomberg News, *Fracking Moratorium Urged by U.S. Doctors Until Health Studies Conducted*, reports that doctors at a conference on the health effects of hydraulic fracturing said that the U.S. should declare a moratorium on the drilling process until the health effects are better understood. “We’ve got to push the pause button, and maybe we’ve got to push the stop button” on fracking, said Adam Law, an endocrinologist at Weill Cornell Medical College in New York, in an interview at a conference in Arlington, Virginia that’s the first to examine criteria for studying the process. A moratorium on fracking pending more health

research “would be reasonable,” said Jerome Paulson, who heads the Mid-Atlantic Center for Children’s Health and the Environment in Washington, in an interview. His group is funded in part by the CDC and Environmental Protection Agency and helped sponsor the conference with Law’s organization, Physicians Scientists and Engineers for Healthy Energy. (<http://www.bloomberg.com/news/2012-01-09/fracking-moratorium-urged-by-u-s-doctors-until-health-studies-conducted.html>)

- *How the Texas Natural Gas Boom Affects Health and Safety* is a study commissioned by Texas OGAP (Oil and Gas Accountability Project), a campaign of Earthworks. It focuses on the health and well-being of the residents of the Barnett Shale drilling area of North Texas. ([http://www.earthworksaction.org/library/detail/natural\\_gas\\_flowback](http://www.earthworksaction.org/library/detail/natural_gas_flowback))
- A study done by Cook’s Children’s Hospital in Ft. Worth, TX found that 25% of the children living in the Barnett Shale drilling area of North Texas suffer from asthma,

compared with 7% in the rest of the state. (<http://www.dentonrc.com/local-news/local-news-headlines/20120115-public-health-professionals-issue-report.ece>)

- According to a 2011 report by the Centers for Disease Control and Prevention, *invasive breast cancer is on the rise* in Denton County TX and five neighboring counties, all in the Barnett Shale drilling area, while the incidence of the disease is down in the rest of the state and across the nation. (<http://www.dentonrc.com/local-news/special-projects/gas-well-drilling-headlines/20110831-breast-cancer-rate-climbs-up.ece>)
- In a report from New York State (*Upstate Hydrofracking Bad for Long Island*), concerns are expressed regarding the number of cancer-causing agents used in hydraulic fracturing and released into the environment. The link between endocrine disruptors and cancer formation is also discussed: *“Thirty-seven percent of chemicals in fracking fluids have been identified as endocrine-disruptors. By definition, these substances have the power, at vanishingly low concentrations, to alter hormonal signaling pathways within the body. Many can place cells on the pathway to tumor formation.”* ([http://www.theislandnow.com/opinions/article\\_07d01824-2741-11e1-9d44-0019bb2963f4.html](http://www.theislandnow.com/opinions/article_07d01824-2741-11e1-9d44-0019bb2963f4.html))
- An example of how hydraulic fracturing for natural gas in Pennsylvania contributes to negative health impacts in other parts of the country is the concern over **silica sand mining in Wisconsin and Minnesota**. While hydraulic fracturing fluid is generically defined as a mixture of water, chemicals and sand, with the latter component seeming patently innocuous, the type of sand preferred by drilling companies for its ability to withstand intense pressure is silica sand, and the mining of this sand has generated health concerns in the aforementioned states. The main concern is the public’s exposure to silica dust. In a report published by ReaderSupportedNews.org, Andrew Puetz,

**While hydraulic fracturing fluid is generically defined as a mixture of water, chemicals and sand, with the latter component seeming patently innocuous, the type of sand preferred by drilling companies... has generated health concerns.**

general manager at Chrysler Winona in Winona, Minn., talks of the effects of “frac sand” dust on the exteriors of vehicles at his dealership (he spends \$2,000 a month just to keep them clean) and asks, pertinently: *“What is that doing to our lungs and everything else?”* The report contains this statement from the Occupational Safety and Health Administration (OSHA) regarding crystalline silica: *“The seriousness of the health hazards associated with silica exposure is demonstrated by the fatalities and disabling illnesses that continue to occur in sandblasters and rockdrillers. Crystalline silica has been classified as a human lung carcinogen. Additionally, breathing crystalline silica dust can cause silicosis, which in severe cases can be disabling, or even fatal. The respirable silica dust enters the lungs and causes the formation of scar tissue, thus*

*reducing the lungs’ ability to take in oxygen. There is no cure for silicosis. Since silicosis affects lung function, it makes one more susceptible to lung infections like tuberculosis. In addition, smoking causes lung damage and adds to the damage caused by breathing silica dust.”*

The report further states that *“there are no conclusive studies regarding the health effects for the kind of exposure the public has to silica sand. The data on silicosis has been mainly linked to close-quarters exposure over an extended period of time. But research shows that the effects of silicosis, and other airborne illnesses, can take up to twenty years to appear.”* The latter part of that statement can be said to relate to the airborne toxins associated with hydraulic fracturing in Pennsylvania as well. (<http://wagingnonviolence.org/2012/02/no-fracking-way-protesters-block-frac-sand-mining-operations/>)

- The story of **Greene County PA resident Pam Judy** is significant in that it illustrates both the uncanny consistency of illnesses in Pennsylvania and in other states near hydraulic fracturing operations, and also the shortcomings of the **PA DEP** in testing for and regulating the causes of said illnesses. In the spring of 2009 a compressor station was built 780 feet from the

Judy family home on an adjoining landowner's property. Noise and fumes soon limited the time they could spend outdoors. Then various health symptoms emerged among the family members. Ms. Judy conducted research regarding emissions from compressor stations and possible health effects and found that residents of Dish TX in the Barnett Shale area had a similar problem a few years previously. She contacted (now former) Dish Mayor Calvin Tillman; Mayor Tillman was able to provide her with a list of blood and urine tests to determine exposure. The tests revealed measurable levels of benzene (carcinogen) and phenol (hazardous air pollutant). At her request, in June 2010 the PA DEP performed air quality tests at the site. The tests revealed the presence of 16 chemicals, most of which are known carcinogens.

Yet in November 2010, when the DEP issued its final report, it stated that it could find “no emission levels that would constitute a concern to the health of residents living near Marcellus operations,” further stating that “the sampling results were used to characterize acute non-cancer health risks associated with industry emissions.” It further stated that the report “did not address the cumulative or long-term impact of air emissions or the lifetime cancer risks of such emissions.” This after numerous carcinogens were detected in the initial test sampling. ([http://www.marcellusoutreachbutler.org/uploads/7/0/4/5/7045073/pam\\_judy-\\_greene\\_county.pdf](http://www.marcellusoutreachbutler.org/uploads/7/0/4/5/7045073/pam_judy-_greene_county.pdf))

- In February 2012, the PA General Assembly passed House Bill 1950, the so-called “impact fee” bill, later to be known as Act 13. One provision of the bill requires drillers to disclose to treating physicians the chemicals they use in the hydraulic fracturing process, but prohibits said physician from sharing that information with patients or the public. In a March 2012 op-ed piece in the Pittsburgh Post-Gazette, Dr. Bernard Goldstein, emeritus professor in the University of Pittsburgh Graduate School of Public Health's Department of Environmental and Occupational

**The tests revealed the presence of 16 chemicals, most of which are known carcinogens. The [final] report “did not address the cumulative or long-term impact of air emissions or the lifetime cancer risks of such emissions.” This after numerous carcinogens were detected in the initial test sampling.**

Health, and Jill Kriesky, senior project coordinator at the school's Center for Health Environments and Communities, state that the bill “retains some of the worst aspects of industry secrecy about proprietary hydrofracking chemicals while making unethical demands on physicians.” They ask: “Imagine a physician caring for a child whose illness might have been caused by long-term exposure to a proprietary fracking chemical while playing near a drill site. Assume that after signing a legally binding nondisclosure agreement, the physician is given the identity of the chemical and comes to believe it caused the illness. What can the physician tell the families of other neighborhood children who play in the same field?” Further: “The law also allows the company to keep secret from physicians information about agents that come up from the ground during drilling, such as natural gas constituents -- which themselves can be toxic -- and naturally occurring

toxic agents such as arsenic, barium, brine components and radioactive compounds dissolved in flowback water. Nor can public health authorities begin with knowledge of a secret chemical and ask whether there is an increase in an illness that the chemical is known to cause.” (<http://old.post-gazette.com/pg/12071/1215612-109.stm>)

- In a March 2012 AlterNet.org article, *Fracking Democracy: Why Pennsylvania's Act 13 May Be the Nation's Worst Corporate Giveaway*, recently retired former Pittsburgh City Councilman Doug Shields speaks of the physicians' confidentiality provision in Act 13: “I know exactly why that is in there. That makes it extremely difficult to bring a civil suit if the information is locked away behind confidentiality agreements. A physician can't release information during discovery. They can't even tell another patient that they are dealing with the same thing. They can't go to a public health official and disclose it—this lady has benzene in her blood, or methyl-whatever. He can't do it.” ([http://www.alternet.org/story/154459/fracking\\_democracy%3A\\_why\\_pennsylvania's\\_act\\_13\\_may\\_be\\_the\\_nation's\\_worst\\_corporate\\_giveaway](http://www.alternet.org/story/154459/fracking_democracy%3A_why_pennsylvania's_act_13_may_be_the_nation's_worst_corporate_giveaway))

# Health Effects on Pets, Livestock and Wildlife

**“At what point does preliminary evidence of harm become definitive evidence of harm? When someone says, ‘We were not aware of the dangers of these chemicals back then,’ whom do they mean by ‘we?’”**

—Sandra Steingraber, *Living Downstream* (Da Capo Press, 2010)

**“Even without detailed information on the toxins resulting from gas drilling, the authors of the study say they have no doubt natural gas drilling operations killed or injured the animals they reference. Their conclusion? Halt drilling until more data can be collected, and the health impacts could be better documented.”**

- In January 2012, the peer-reviewed scientific study *“Impacts of Gas Drilling on Human and Animal Health”* was published in *New Solutions: A Journal of Environmental and Occupational Health Policy*. The study, written by Dr. Michelle Bamberger, a New York State veterinarian, and Prof. Robert E. Oswald of the Dept. of Molecular Medicine at **Cornell University**, details farmers’ experiences when their livestock and pets came in contact with drilling waste water. The following quote is from the abstract of the study: *“Environmental concerns surrounding drilling for gas are intense due to expansion of shale gas drilling operations. Controversy surrounding the impact of drilling on air and water quality has pitted industry and leaseholders against individuals and groups concerned with environmental protection and public health. Because animals often are exposed continually to air, soil, and groundwater and have more frequent reproductive cycles, animals can be used as sentinels to monitor impacts to human health. This study involved interviews with animal owners who live near gas drilling operations. The findings illustrate which aspects of the drilling process may lead to health problems and suggest modifications that would lessen but not eliminate impacts. Complete evidence regarding health impacts of gas drilling cannot be obtained due to incomplete testing and disclosure of chemicals, and nondisclosure agreements. Without rigorous scientific studies, the gas drilling boom sweeping the world will remain an uncontrolled health experiment on an enormous scale.”* ([http://www.psehealthyenergy.org/data/Bamberger\\_Oswald\\_NS22\\_in\\_press.pdf](http://www.psehealthyenergy.org/data/Bamberger_Oswald_NS22_in_press.pdf))
- A **StateImpact** article, *“Dead Calves and Hairless Puppies,”* discusses the **Bamberger-Oswald study**. It mentions that most of the health impacts on animals associated with shale gas drilling affect the animals’ reproductive systems. *“But what’s more interesting about this study,”* according to the article, *“is not so much what the two scientists documented, as what they didn’t document.”* An excerpt from the study explains: *“This study is not an epidemiologic analysis of the health effects of gas drilling, which could proceed to some extent without knowledge of the details of the complex mixtures of toxicants involved. It is also not a study of the health impacts of specific chemical exposures related to gas drilling, since the necessary information cannot be obtained due to the lack of testing, lack of full disclosure of the International Union of Pure and Applied Chemistry (IUPAC) names and Chemical Abstracts Service (CAS) numbers of the chemicals used, and the industry’s use of nondisclosure agreements.”* (According to the **StateImpact** article, animal owners who have reached a financial

settlement with an energy company often have to sign a non-disclosure statement, which prevents them from discussing the case.) The article concludes: *“Even without detailed information on the toxins resulting from gas drilling, the authors of the study say they have no doubt natural gas drilling operations killed or injured the animals they reference. Their conclusion? Halt drilling until more data can be collected, and the health impacts could be better documented.”* (<http://stateimpact.npr.org/pennsylvania/2012/01/19/dead-calves-and-hairless-puppies/>)

- The above **StateImpact** article references another SI article, *“Changing Priorities: Science Funding Slashed Under Corbett Administration.”* Much of the funding was for Marcellus Shale research, and much of the research was to be on drilling’s impact on wildlife. (<http://stateimpact.npr.org/pennsylvania/2012/01/18/changing-priorities-science-funding-slashed-under-corbett-administration/>)
- An article on the Bamberger-Oswald study published by the environmental advocacy group **Protecting Our Waters** focuses on two cases in which “accidental control groups” existed because cattle in a nearby pasture did not have access to the stream or pond contaminated by toxic gas drilling waste. The “control groups” remained healthy, while the groups exposed to drilling contaminants experienced high fatality rates and elevated incidences of reproductive issues the following spring. Below are excerpts from the study detailing these cases: *“Two cases involving beef cattle farms inadvertently provided control and experimental groups. In one case, a creek into which wastewater was allegedly dumped was the source of water for 60 head, with the remaining 36 head in the herd kept in other pastures without access to the creek. Of the 60 head that were exposed to the creek water, 21 died and 16 failed to produce calves the following spring. Of the 36 that were not exposed, no health problems were observed, and only one cow failed to breed.”* *“At another farm, 140 head were exposed when the liner of a wastewater impoundment was allegedly slit, as reported by the farmer, and the fluid drained into the pasture and the pond used as a source of water for the cows. Of those 140 head exposed to the wastewater, approximately 70 died and there was a high incidence of stillborn and stunted calves. The remainder of the herd (60 head) was held in another pasture and did not have access to the wastewater; they showed no health or growth problems. These cases approach the design of a controlled experiment, and strongly implicate*

wastewater exposure in the death, failure to breed, and reduced growth rate of cattle.” (<http://protectingourwaters.wordpress.com/2012/02/02/farmers-to-corbett-heres-the-science-protect-our-animals-and-crops/>)

- The Sept. 2011 **StateImpact** article *Quarantined Cows Give Birth to Dead Calves* describes an incident which occurred in Shippen Township, Tioga County PA. In late April 2010, drilling waste water from a large storage pond leaked through its plastic liner and flowed onto a cow pasture in Shippen Township, Tioga County. Farmers Don and Carol Johnson found the leak, along with the hoof prints of 28 beef cattle who had wandered through and possibly drank the contaminated water. The waste water came from a well that had been fracked on their property by East Resources. When tested, the water contained chloride, iron, sulfate, barium, magnesium, manganese, potassium, sodium, strontium and calcium. **The spill killed all vegetation in an area 30 feet by 40 feet.** In early May, Pennsylvania’s Department of Agriculture quarantined the cows, worried that the resulting beef could be tainted and make people sick. Although no one actually saw the cows drink the frack water, Carol Johnson says there’s no reason to believe they didn’t. *“Well, you don’t put hoof marks in that water, that deep, without somebody drinking something,”* says Johnson. The water had a high salt content, and Johnson says animals, including cows, like to lick up salt. Of the original cows, only ten yearlings are still quarantined. But Johnson says of the eleven calves born this spring, only 3 have survived. *“It’s abominable,”* says Johnson, who along with her husband Don, has been raising cows on that land for 53 years, after taking over the farm from Don Johnson’s grandfather. *“They were born dead or extremely weak. It’s highly unusual,”* she said. *“I might lose one or two calves a year, but I don’t lose eight out of eleven.”* Johnson warns hunters she sees near her property not to eat any of the game they catch. *“Deer, grouse, rabbits, they’re up on that [well] pad licking,”* she says. *“They don’t know what’s in the water... The whole thing has become one big mess.”* (<http://stateimpact.npr.org/pennsylvania/2011/09/27/burning-questions-quarantined-cows-give-birth-to-dead-calves/>)
- In January 2012, a letter was sent to PA Gov. Tom Corbett from over 40 Pennsylvania sportsmen’s organizations representing over 100,000 members, expressing concerns over the effects of natural gas drilling on the state’s fish and wildlife populations and requesting that the governor

maintain the moratorium on new drilling in state forests signed by former Gov. Ed Rendell in 2010. To date, “with 700,000 acres—nearly half of Pennsylvania’s state forest land—already leased for Marcellus Shale energy development, the state’s hunting and fishing legacy is under threat. In May 2010, the Department of Conservation and Natural Resources (DCNR) concluded a study that found that leasing any more state forest lands would significantly affect the wild character and ecological integrity of the state’s forest system. The DCNR study further found that gas development on private lands is already surrounding the state forest in some areas, causing an uncompensated, lasting change on the forest’s wild character. In areas where drilling is already occurring on public lands, access to areas where sportsmen and women have traditionally hunted, trapped or fished has been restricted where there are active drilling operations. Hunters, anglers and trappers have found new or modified roads on leased state forest lands and have encountered large volumes of truck traffic in areas where active drilling is occurring. By prohibiting additional leasing of state forest lands, the state can be sure that it fulfills (1) the state’s constitutional mandate to conserve and maintain its public natural resources for Pennsylvanians and (2) DCNR’s statutory directive to manage state forest lands for multiple uses that maintain the wild and ecological character of the state forest system.” The letter concludes: “Together, we, the sportsmen and women who utilize Pennsylvania’s state forest lands, respectfully request that you uphold the moratorium on leasing of additional state forest lands and that you preserve the long-held tradition of hunting, fishing, trapping and other sportsmen-related activities on these lands.” ([http://www.tu.org/press\\_releases/2012/sportsmen-groups-to-gov-corbett-dont-lease-more-state-forest-land-for-oil-and-ga](http://www.tu.org/press_releases/2012/sportsmen-groups-to-gov-corbett-dont-lease-more-state-forest-land-for-oil-and-ga))

- According to a Feb. 26, 2012 *Pittsburgh Tribune-Review* article, a drilling-related leak into a stream last

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week prompted the *state Fish and Boat Commission’s eighth investigation since last fall into leaks from Butler County-area pipeline projects*, according to spokesman Rick Levis. It has fined two companies \$13,500 for sediment leaks that threatened aquatic life in the area, part of a problem that has plagued the state as drilling operations ramp up, commission officials said. “It’s becoming more and more of an issue,” said Tom Kamerzel, who directs the commission’s law enforcement bureau in Harrisburg. With a wet, hilly topography here, it’s very hard to keep Pennsylvania’s streams crystal clear whenever pipeline companies bore underneath them, commission and industry officials said. Regulators prefer pipeline companies bore under streams, but high pressure from underground boring can easily force drilling mud into creeks, threatening aquatic life. Contractors hired by Keystone Midstream Services LLC were boring 60 feet underground Tuesday to install new pipe when pressure on the saturated ground forced water and

the drilling clay bentonite up through natural fissures into an unnamed tributary of Crab Run in Lancaster in Butler County. The clay gathered in Crab Run as **thick as one-fourth of an inch**, dissipating more than two miles downstream, Levis said Friday. The commission and Department of Environmental Protection investigators found no dead fish as of Friday but are still monitoring the stream, spokesmen said. Bentonite is not toxic, but any sediment leaking into streams can kill fish and aquatic life by clogging their gills, burying them or burying their eggs, scientists said. The native brook trout, a species of great concern, buries its eggs at just this time of year, said David Argent, professor of wildlife and fisheries sciences at California University of Pennsylvania. “*This could be extremely detrimental to aquatic life*,” Argent said. (<http://triblive.com/home/1033789-85/drilling-commission-companies-leaks-levis-pipeline-regulators-sediment-state-aquatic>)

## ***Dissatisfaction with Regulatory Agencies***

Unfortunately, Pam Judy’s case is not the only one in which follow-up testing by the DEP failed to consider carcinogens and toxins that were detected in initial test samplings. As her story (see “Human Health Impacts”) illustrated, the PA DEP is often either unable or unwilling to adequately test for or adequately protect against the harmful health effects that accompany hydraulic fracturing, unconventional natural gas drilling and its associated infrastructure. When asked if dissatisfaction with the DEP’s responses to citizens’ complaints was a factor in Pittsburgh’s decision to ban drilling, City Councilman Doug Shields’ response was: *“Suffice to say that it was the deliberate indifference to the people’s concerns at every level of state government that caused me to introduce the Ban and the prime reason why most of my colleagues voted for it.”*

**“Suffice to say that it was the deliberate indifference to the people’s concerns at every level of state government that caused me to introduce the Ban and the prime reason why most of my colleagues voted for it.”**

- In his essay *The Pennsylvania DEP, Another Red Herring?* Washington County resident and CELDF representative Eric Belcastro explores the lawsuit that Beth Voyles of Amwell Township, Washington County has brought against the PA DEP with the *“humble but important aim”* that the court would require the DEP simply to *“perform its required duty under Pennsylvania law to perform a full investigation of her complaints regarding air quality (odor) and water quality (contamination)”* as a result of a Range Resources waste impoundment and drilling operation on an adjoining property. Original documents prepared by Smith Buttz, LLC are included with this report. The legal documents claim that documents from the DEP were produced *“in seemingly random fragments”* with *“clearly missing pages”* and other documents would not be produced at all. The conclusion here being that the DEP is either *“accepting such fragmented documents from Range, or that the DEP is selectively refusing to disclose certain documentation.”*

Even the fragments of documents that were provided revealed that the DEP *“knowingly and consistently”* was turning a blind eye to a *“myriad of violations”* at the location, or was oblivious to them. For example, Ranges’ contract laboratory, Microbac, tested Voyles’ spring and well water and detected 1,4 Butanediol, a hazardous man-made industrial solvent. DEP issued no citation or violation, did not investigate why this substance might be in her water, and did not inform Voyles that this substance was in her water and that her water was no longer safe to drink. Further testing by Microbac, *“either on its own or at Range’s direction, did not include testing for the presence of 1,4-Butanediol.”* No explanation was provided by Microbac as to why this was. As in Pam Judy’s case, toxins and carcinogens



initially detected were later either not tested for or were discounted/omitted in the final report.

Mr. Belcastro's essay includes statements from several other Pennsylvania residents dissatisfied with DEP's responses to their complaints. (<http://canon-mcmillan.patch.com/blog-posts/the-pennsylvania-dep-another-red-herring-2>)

- A recent high-profile dispute with the DEP has been waged by residents of **Carter Road, Dimock Twp., Susquehanna County PA** over DEP's decision to allow **Cabot Oil and Gas** to discontinue providing drinking water to Cabot Road residents. DEP had concluded in 2009 that Cabot's nearby drilling activities had contaminated the drinking water supplies of 10 residences on Carter Road in Dimock.  
The initial **Consent Order and Agreement** between DEP and Cabot, dated Nov. 4, 2009, required Cabot to submit a plan to permanently "restore or replace" these residents' water sources, until, "the Department notifies Cabot, in writing, that the Department has determined that the Affected Water Supply has been restored such that Cabot is no longer required to provide such purchased water." In other words, DEP would test the water sources.  
The COA between DEP and Cabot was revised in December 2010 so as to **not** include water testing as a criteria for Cabot to stop providing clean water to the impacted families. Attorneys for several Carter Road families say that the 2010 COA is "illegal" in that it **falls short of state laws requiring drillers to "restore or replace" water they damage**. Cabot has provided water samples to state laboratories; the federal EPA has reviewed that data and concluded that the water "does not indicate an immediate health threat to well water users."  
However, attorneys have countered in a letter to the EPA that "the results from that laboratory, Test America, are at best misleading and inapposite to the issue of groundwater safety given the instructions by Cabot to exclude most contaminants from analysis. Indeed, many of the samples were analyzed after being filtered through a 0.45 micron filter. This filtration procedure was doubtlessly done by the laboratory at the request of Cabot to artificially lower the contamination concentrations and detection." (As **Doug Shields** mentioned at his June 4, 2011 presentation at the Butler Library, why are the drillers conducting these tests [as Range did in the Voyles case] and not the DEP? "It's like the fox guarding the henhouse!")

(<http://stateimpact.npr.org/pennsylvania/tag/dimock/>)  
(<http://stateimpact.npr.org/pennsylvania/2011/12/08/deps-dimock-decision-based-on-2010-agreement-not-water-quality/>) (<http://protectingourwaters.wordpress.com/2011/12/06/protecting-our-waters-goes-to-dimock-whats-in-their-safe-water/>)

In January 2012 the **EPA** initiated its own battery of tests on Dimock's water, prompting complaints from both the **PA DEP** and **Cabot Oil and Gas**. EPA's testing of water wells at 64 residences in Dimock between January and June 2012 "found the **hazardous substances arsenic, barium or manganese in well water at five homes at levels that could present a health concern**." EPA, which had been delivering water to four of the aforementioned five homes, made the determination in July 2012 to stop deliveries, saying that "in each of those cases the residents currently have or will have a treatment system that can treat the contaminants to acceptable levels at the tap. It also noted that those contaminants, which it has said can be associated with natural gas drilling, are also naturally occurring substances."

Dimock resident Scott Ely, one of the homeowners receiving deliveries, said he has been told by several consultants that the high pH level in his water would make it "difficult to treat economically."

"I have no plans; I have no system," he said. EPA's repeated tests of his water found arsenic, chromium, lithium and sodium above a level flagged for a toxicologist's review. He said that the EPA representative who delivered his most recent test results (July 2012) told him "off the record" **not to drink or bathe in his water**, but that the agency will remove the bulk water tank at his home by Aug. 6. In a written response to questions, the EPA said its staff "did not have any 'off the record' conversations with residents."

EPA's initial water test results for Dimock in March 2012 showed that Dimock's water was "safe to drink," baffling many Dimock residents. "Why would they make a statement that all our water is drinkable [when] not only do we have limits that are above and beyond, we have stuff that doesn't even belong in our water," Scott Ely asked. "You think nothing's wrong with this water up here in Dimock, you come up to any house up here and drink this water," said Carter Road resident Ray Kemble. "We want it to be safe. If they can guarantee me that it's safe to drink, I want them to come in and drink it and I'll drink it with them," Dimock resident

Ron Carter added. From all reports, that invitation to drink the water was never accepted by either the EPA or the PA DEP.

A July 2012 **Huffington Post** article reported that Cabot Oil and Gas was nearing a “confidential settlement” with 32 of 36 Dimock households over this incident. And while some residents, like Victoria Switzer and her family, were “*relieved to put this behind us*,” the comments from Dimock residents in the previous paragraph showed “dissatisfaction with regulatory agencies” reaching the federal level.

(<http://thetimes-tribune.com/news/gas-drilling/epa-to-stop-dimock-water-deliveries-1.1348393>) (<http://wnep.com/2012/03/16/dimock-residents-question-epas-water-ruling-2/>) ([http://www.huffingtonpost.com/2012/07/25/dimock-pa-water\\_n\\_1702992.html](http://www.huffingtonpost.com/2012/07/25/dimock-pa-water_n_1702992.html))

- A situation similar to Dimock’s has occurred in the **Woodlands area of Connoquenessing Twp., Butler County**, with **Rex Energy** issuing the final report that well water in the area is fine for human use and the **PA DEP** not stepping in to either confirm or dispute those results. (DEP ultimately sided with Rex Energy on this issue.) Area resident Janet McIntyre says that results from separate tests conducted by the DEP on her water in January and July 2011 are “not even close” to matching those from Rex Energy. Similarly to the Beth Voyles case, copies of follow-up test results from the DEP contained missing pages, failure to test for toxins found in initial test results, etc.

The tests from the DEP showed elevated levels of contaminants in her water post-drilling. The findings of **AMEC Environmental and Infrastructure** of Sewickley, under contract by Rex, that groundwater moves away from the Woodlands homes toward the gas wells, does not eliminate the possibility of contamination from those gas wells, given that pressurized flowback returning up a well-bore could easily back up into an aquifer, regardless

**Conformity to regulation does not alter the fact that many elected officials who have voted to ban drilling do not believe said regulations are adequate protections for the citizens of Pennsylvania from the hazards of hydraulic fracturing.**

of elevation, if a crack in the cement casings was positioned for it to do so.

The water testing was performed for Rex by **Environmental Services Laboratories**, which according to its website, is “a proud member of the *Marcellus Shale Coalition*,” a pro-industry group.

In his well-written essay, *Proof Is In The Eye Of The Beholder*, Evans City school teacher Jason Bell asks the pertinent question: “*Is this what an ‘independent study’ looks like?*” Meanwhile, because of Rex’s report, six families in Connoquenessing Twp., including a three-year-old, a newborn and a pregnant mother, will stop receiving potable water after the

new year, and neither local officials, the local press nor the DEP has stepped up to question the validity of Rex’s report. (<http://www.marcellusoutreachbutler.org/2/archives/12-2011/1.htm>)

- In his Jan. 1, 2012 letter to the **Butler Eagle**, Mike Moyer, chief operating officer of Environmental Services Laboratories, states that Rex Energy conformed to Chapter 78.52 of the state Oil and Gas Act in its handling of the water tests mentioned above. **Conformity to regulation does not alter the fact that many elected officials who have voted to ban drilling do not believe said regulations are adequate protections for the citizens of Pennsylvania from the hazards of hydraulic fracturing.** As is stated in the **CELDF** publication *Common Sense* (see “Who and How?” section): “*To regulate is to permit harmful corporate behavior in communities, whether the people want it or not, under conditions legalized by the state. Those regulations that have become law typically have been recommended or negotiated for by the regulated industry.*” (Pg. 8, *The Four Roadblocks to Stopping Fracking*) (<http://celdf.org/downloads/COMMON%20SENSE%20-%20Banning%20Fracking%20at%20the%20Local%20Level.pdf>)
- A February 2012 **Associated Press** report continues the saga of Connoquenessing Township. While the DEP maintains that water contamination in the Woodlands area had nothing to do with drilling, Dr. Bernard Goldstein, professor emeritus at the **University of Pittsburgh School**

**of Public Health**, says the lack of follow-up tests by the DEP doesn't make sense. "DEP cannot just simply walk away." Goldstein's comments are based on two aspects of the case: the curious combination of contaminants that Janet McIntyre's initial test results revealed and the DEP's suggestion that its own lab may have caused the contamination. The initial water test showed detectable levels of t-Butyl alcohol, acetone, chloromethane, toluene and 1, 3, 5-trimethylbenzene. Goldstein says the multi-chemical mix suggests either multiple sources of contamination or **an industry that uses many different chemicals**. "Where would you get such a strange mixture?" Goldstein asked, adding that **if DEP's own laboratory was even a potential source of the chemicals, the agency had the obligation to follow up**. Another Woodlands resident, Kim McEvoy, expressed her frustrations with the agency thus: "**I don't trust the DEP. Something has happened here.**" (<http://news.yahoo.com/pa-woman-chemicals-water-drilling-area-002734536.html>)

- In a follow-up February 2012 **Associated Press** article, it was revealed that gas wells in Connoquenessing Township near the Woodlands neighborhood had developed **casing problems** during the drilling process, but neither **Rex Energy** nor the **DEP** had disclosed that fact to Woodlands residents nor the public, either at the time of the incident or during recent discussions of possible water contamination in the area. While there's no proof that the casing problems — or reported environmental violations — at Rex drilling sites caused the water contamination for at least 10 households in the rural Woodlands community, residents and environmental groups said that they were distressed to learn of the casing problems. They said that **the state Department of Environmental Protection doesn't seem to understand that the lack of full transparency fuels public mistrust**. "Stonewalling only enhances a public perception that DEP is not doing its job," said Jan Jarrett, president of the environmental group PennFuture. "It just makes everybody look bad, and makes the public nervous and more unsure of the industry as a whole." (<http://news.yahoo.com/w-pa-wells-had-casing-failures-complaint-area-155928460.html>)
- The environmental advocacy group **Mountain Watershed Association**, headquartered in Fayette County PA, is compiling a database of complaints with regard to DEP's responses to PA residents.

In response to my e-mail query about this database, MWA director Veronica Coptis wrote: "*Mountain Watershed is currently compiling a list of DEP complaints that were not followed up but the list is very limited. We did not focus on volunteers reporting back this information to us in last year's round of trainings [i.e., MWA offers citizens' visual assessment trainings for Marcellus shale drilling environmental issues in western PA] because I was hoping it would not be an issue. The training in Butler County [Aug. 2011] was our first of this next round of trainings and we are urging volunteers to provide us with this information as well now. To answer your questions there is currently not a database and when we do get one compiled it will not be accessible online. We plan to use the database for advocacy to report to legislators and DEP officials of what is actually happening in the communities. From a conference call I participated in last week, Trout Unlimited is experience similar issues in the southwest and northwest DEP regions and we are working together to develop an easy way to track this.*"

- A January 2012 report from **Environment and Energy (E&E) News** details how, in three drilling states – Wyoming, Texas and, most recently Pennsylvania – the **EPA** has become involved in water contamination investigations near drilling sites. In each case, the EPA has felt that state agencies' responses to residents' concerns were inadequate. And also in each case, the gas industry has attacked the EPA's involvement. Several **StateImpact PA** articles detail the battle between **Cabot Oil and Gas** and the EPA over the **Dimock** investigation. The intent of this report is not to take sides but to show that there is concern over the adequacy of state regulations at both the federal and grass-roots level. See below for reports on Texas and Wyoming.
- According to the U.S. EPA report, *EPA Issues an Imminent and Substantial Endangerment Order to Protect Drinking Water in Southern Parker County* (see "Groundwater Contamination" section), a citizens' complaint received by the EPA regarding drinking water well contamination was found to be "not adequately addressed by the State [Texas] or the company [**Range Resources**, which was required by the EPA to "**take immediate action to protect homeowners living near one of its drilling operations.**]." Parker County is located west of Fort Worth, TX in the Barnett Shale region.
- In Wyoming, where an **EPA study** showed evidence of **groundwater contamination caused by hydraulic**

**fracturing** (see “Groundwater Contamination” section), the residents of Pavillion, WY, focus of the EPA investigation, **blasted the state of Wyoming** for refusing to help them before the EPA study and for denouncing the study after it was completed, according to an **EcoWatch** report. “*Pavillion residents made continual requests for help from the state of Wyoming and industry before seeking assistance from EPA to address the contamination issues. For over 10 years the state refused to help us. That’s when we went to the EPA. Now it appears the state is joining the industry in fighting this study tooth and nail,*” said John Fenton, **Powder River Basin Resource Council** board member and chair of **Pavillion Area Concerned Citizens**. (<http://ecowatch.com/2012/groups-denounce-attack-on-u-s-epa-investigation-of-hydraulic-fracturing-contamination/>)

- February 2012 **Pittsburgh Post-Gazette** article, *EPA Probing Washington County Shale Operations*, reports that the EPA is and has been conducting a “multi-media” investigation of air, water and hazardous wastes impacts in Washington County PA in connection with specific Marcellus Shale drilling and compressor station operations. The article states that “*the EPA... has the legal authority to step in to supplement state enforcement, much as it did in Dimock, Susquehanna County.*” **Rep. Jesse White, D-Cecil**, said he was unaware of the on-going federal investigation, but he welcomed it because of what he termed “lackluster” regulation by the DEP. “*There are several areas in the county where there are potential problems that might attract the EPA,*” Mr. White said. “*DEP’s regulatory efforts should be motivated by facts, not politics. The EPA isn’t snooping around here for nothing.*” (<http://shale.sites.post-gazette.com/index.php/news/archives/24317-epa-probing-washington-county-shale-operations>)
- In its draft report released in August 2011, **the federal energy panel investigating shale gas drilling explicitly acknowledges that current regulations may be insufficient to protect the environment and public health.** It notes serious environmental impact from shale gas drilling and says it is “*far from clear*” whether federal and state regulations are protecting the public. “*If effective environmental action is not taken today,*” the report says, “*the potential environmental consequences will grow to a point that the country will be faced (with) a more serious problem.*” (<http://www.propublica.org/article/report-for-obama-questions-effectiveness-of-gas-drilling-regulations/single>)

# Non-disclosure Agreements

“**T**he industry claims to have a record of clean work. What they really have is a record of pollution and non-disclosure agreements.” – Sharon Wilson, coordinator of Texas Oil and Gas Accountability Project, from “*Don’t Drink the Water*,” Fort Worth Weekly (<http://www.fwweekly.com/2012/01/25/dont-drink-the-water/>)

**‘If it’s so safe, let the public review all the cases.’**

These agreements occur when landowners sue gas companies for water contamination that regulatory agencies claim are “not related to drilling.” The company agrees to supply the plaintiff with bottled water and water buffaloes in exchange for the plaintiff’s silence about their experience. In worst-case scenarios of extreme environmental damage, the drilling company will purchase the contaminated property and have the owners sign non-disclosure agreements, meaning they can’t say they’ve been bought out because of contamination. This interferes with further investigations of the contamination and also with research into illnesses occurring in drilling areas due to air and water contamination. It also undercuts the industry’s contention that its processes are “safe,” and is an impediment to public health and safety in that communities are not alerted to contamination and illness occurrences in their vicinity.

- A **New York Times** article from Aug. 2011 reports that **“there is in fact a documented case [of fracking causing groundwater contamination], and the EPA report that discussed it suggests there may be more. Researchers, however, were unable to investigate many suspected cases because their details were sealed from the public when energy companies settled lawsuits with landowners. Current and former EPA officials say this practice continues to prevent them from fully assessing the risks of certain types of gas drilling. I still don’t understand why industry should be allowed to hide problems when public safety is at stake,”** said Carla Greathouse, the author of the EPA report that documents a case of drinking water contamination from fracking. **‘If it’s so safe, let the public review all the cases.’**

*In their report, EPA officials also wrote that Mr. Parsons’ case was highlighted as an ‘illustrative’ example of the hazards created by this type of drilling [hydraulic fracturing], and that legal settlements and nondisclosure agreements prevented access to scientific documentation of other incidents. ‘This is typical practice, for instance, in Texas,’ the report stated. ‘In some cases, the records of well-publicized damage incidents are almost entirely unavailable for review.’* **Bipartisan federal legislation before Congress would require judges to consider public health and safety before sealing court records or approving settlement agreements.”** ([http://www.nytimes.com/2011/08/04/us/04natgas.html?\\_r=4&hp&pagewanted=all&](http://www.nytimes.com/2011/08/04/us/04natgas.html?_r=4&hp&pagewanted=all&))

- **Briget Shields**, the wife of Pittsburgh City Councilman Doug Shields, has taken on the task of advocacy for individuals and families who have been silenced by non-disclosure agreements. She interviews neighbors and family members familiar with the circumstances and then tells their stories anonymously, often to municipal officials who are unaware of these occurrences. Often the circumstances include health issues. I asked Ms. Shields for a statement on non-disclosure agreements in Pennsylvania:

*“Here in PA there are now many people living in areas where drilling, fracking, compressor stations and pipeline leasing are taking place and they are suffering physical, economic and emotional crisis. Many of these families are in the middle of law suits and unable to speak out, (non-disclosure agreements) or families who have lost their well-water and have been threatened by the gas industry to have the water that is being trucked in and put into water buffaloes on their property stopped. Some who do speak out spend a lot of money paying for their own drinking water.*

*I try to go to some of the council meetings in these areas and speak to the people making the decisions to let them know that we know there are many people living in their communities who are suffering. It’s hard to imagine a single mother with 2 kids afraid to speak out when her water is being threatened. It’s also hard to believe many people don’t believe what we are telling them.*

*I try to make this known whenever we are speaking to groups that this is occurring, unbelievable as it may seem in America today.*

*A recent settlement was made against Range Resources in Washington County with a family I happen to know, the Hallowich family. They had to evacuate their home because of water and air contamination. They have suffered greatly the past 4 years as a result of drilling in Washington County. They settled a few weeks ago and the industry had the settlement sealed. The Post Gazette is taking the matter to court to have the records*

**“Silence is the prime tool of villains.”**

*open to the public.”* (<http://pipeline.post-gazette.com/index.php/news/environment/24093-post-gazette-moves-to-open-sealed-hallowich-lawsuit>) (<http://stateimpact.npr.org/pennsylvania/2012/12/07/appeals-court-agrees-with-newspapers-in-sealed-fracking-case/>) (<http://pipeline.post-gazette.com/news/archives/24959-mark-ruffalo-to-pg-gas-industry-hiding-behind-non-disclosure-deals>)

Doug Shields on non-disclosure agreements:

***“Silence is the prime tool of villains. I am well acquainted with civil settlements and confidentiality agreements from my work both in the legal profession and in Council. They have their place. However, there is a larger public interest associated with these settlements in Pennsylvania’s gas land. It amounts to a practical, legal form of extortion.***

*I will be following the Post Gazette’s lawsuit to unseal the settlement recently achieved in a case in Washington County. I know the family involved and I hold them harmless in the matter. What other options did they have in light of the regulatory somnolence on the part of the Commonwealth? Those who don’t sign face years of litigation against an adversary with very deep pockets and the burden of proof is on the plaintiff. No one should have to walk that path. The outcome in the settlement was a foregone conclusion. There is a larger public interest in these cases and they need to be opened for public view.”*

In March 2013, President Judge Debbie O’Dell-Seneca of Washington County Court of Common Pleas entered an order to unseal the records of the Hallowich case. According to the unsealed records,

Range Resources, MarkWest Energy and Williams Gas agreed to settle the high profile contamination case in Washington County for \$750,000.

(<http://stateimpact.npr.org/pennsylvania/2013/03/21/drilling-companies-agree-to-settle-fracking-contamination-case-for-750000/>)

## ***Residential/Urban/Suburban Drilling; Proximity of Drilling to Vulnerable Populations***

It is a misconception to assume that drilling for natural gas takes place only in remote rural areas. As the photos from **FWCANDO.org (Fort Worth Citizens Against Neighborhood Drilling Ordinance)** show, drilling can take place in urban and suburban settings. ([www.FWCANDO.org](http://www.FWCANDO.org))

**It is happening in our state parks, game lands and conservation districts. It is everywhere. The Oil and Gas industry has spent billions on acquisitions and don't care where they drill as long as they can turn a profit."**

- **Doug Shields** first learned of the Marcellus Shale drilling boom from constituents in 2009, when residents of the Lincoln Place neighborhood of Pittsburgh were calling his office inquiring why they were being offered gas lease contracts on their properties. When asked if Pittsburgh's drilling ban was merely "symbolic" and if drilling within the city was a legitimate concern, Councilman Shields gave this response:  
*"The ban is not a symbol; it is a fact. That is an important distinction. It [drilling] can and will happen in any environment, be it urban - i.e. Fort Worth, TX - suburban - i.e. Williamsport, PA - or rural - i.e. Dimock, PA. It is happening in our state parks, game lands and conservation districts. It is everywhere. The Oil and Gas industry has spent billions on acquisitions and don't care where they drill as long as they can turn a profit."*
- In the summer of 2011, community groups began organizing in the South Hills area of Allegheny County to express concerns about **potential drilling in nearby residential areas**. Most of the gas leases in residential neighborhoods were signed by the owners of **country clubs and golf courses**. (<http://www.post-gazette.com/stories/local/neighborhoods-south/anti-drilling-groups-to-attend-community-day-314724/>) Butler Township has a similar concern with 239 acres having been leased by Krendale Golf Course in an area zoned residential. Proposed legislation in Harrisburg would severely restrict a municipality's zoning capability, thus opening the residential areas of Butler Township to drilling and related infrastructure (compressor stations, pipelines, etc.)

- **PennEnvironment** reports that permitted well sites exist within two miles of more than 320 day care facilities, 67 schools and nine hospitals statewide. *“Evidence that gas can travel underground at least a mile and as much as seven miles from a well to contaminate a home’s water supply suggests that people living within a one- or two-mile radius of a well are potentially vulnerable to water contamination. Air pollution goes where the wind blows, and it is likely that all of the activities related to gas extraction – or the impacts of an accident – could raise the average level of diesel soot, smog and hazardous air pollutants within a one- or two-mile radius of a well or associated infrastructure.”* (from *In the Shadow of the Marcellus Boom*) (<http://www.pennenvironmentcenter.org/reports/pac/shadow-marcellus-boom>)

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*effects would be an encroachment on this right. Adverse health effects associated with hydraulic fracturing practices can include respiratory, cardiovascular, dermal and neurological effects.”* Human rights norms of concern #s 15 and 16 deal with school attendance and the right to education. *“Hydraulic fracturing operations that would prevent some students from attending school or being transported to school due to their need to avoid chemical exposures would be an encroachment on this right.”* Human rights norm of concern #23 deals with persons with disabilities. *“Any place-bound persons (in hospitals or elder care facilities, for example) may be reasonably expected to experience more serious adverse effects from exposure to fracking operations than the general public.”* ([http://www.earthworksaction.org/files/publications/EHRA\\_Human-rights-fracking-FINAL.pdf](http://www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf))

- The **DEP** recorded **241 violations of environmental regulations at Marcellus wells within two miles of a day care facility, and 40 violations within two miles of a school**, from January 2008 to June 2010 alone. (from *In the Shadow of the Marcellus Boom*)
- According to the document *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas*, allowing natural gas wells and infrastructure in close proximity to schools and hospitals could constitute human rights violations. Human rights “norms of concern” #s 8 and 9 address the duty to protect children and the rights of children to the highest standard of health. *“This is the child’s right to special protections, and the state’s duty to provide special protections, from infliction of harm, including harm that could result from unavoidable exposure to environmental toxics... Activities that put children at increased risk of adverse health*





# Well Density and Accompanying Infrastructure

“*We have three metering stations, 11 compressor stations, and over 20 pipelines in less than two square miles.*”

– Calvin Tillman, former mayor of Dish, TX (<http://baddish.blogspot.com>)

**Pennsylvania’s  
regulators don’t  
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[Marcellus Shale]  
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where they are.**

The issue of well density and accompanying infrastructure was first brought to my attention when I heard **Doug Shields** speak at the Butler Public Library in June 2011. He asked the general question of all Pennsylvania municipalities: “*How many wells are you going to permit per square mile? 50 wells? 100 wells? Will state regulations even allow you to determine the number of wells in your municipality?*”

The answer to the last question is more than ever in grave doubt, considering the legislation being proposed in Harrisburg. And with the wells come the compressor stations with their health hazards, and the pipelines with their 10-ft. right-of-ways held in perpetuity, thereby restricting land use in the municipality. This is another issue that has caused municipalities to seek to restrict or to ban drilling within their borders.

- A January 2012 **ABC News/Associated Press** report details the conflicts between landowners and a pipeline operator in northern Pennsylvania over eminent domain pipeline placement. Some of the complaining landowners say the company steamrolled them by refusing to negotiate in good faith on either monetary compensation or the pipeline’s route. Their attorneys say the company has skirted Pennsylvania’s eminent domain rules governing compensation. Residents are fighting the pipeline on two fronts: challenging the eminent domain proceedings in court and appealing the approval of the pipeline by the **Federal Energy Regulatory Commission (FERC)**. Deborah Goldberg, an attorney for the non-profit public interest law firm **Earthjustice**, said the large number of condemnations suggests that the pipeline company “*never made a serious effort to get negotiated agreements with the landowners that the landowners thought were fair.*” Earthjustice has intervened in the pipeline challenge. (See the reference to **Earthjustice** in the “Legal Concerns” section of this report.) The dispute could foreshadow eminent domain battles to come as more pipelines are approved and built to carry shale gas to market in states like Pennsylvania, New York and Ohio. (<http://finance.yahoo.com/news/landowners-fight-eminent-domain-pa-215039548.html>)
- In December 2011, the **Philadelphia Inquirer** published a four-part series of reports on natural gas pipeline issues in Pennsylvania. The first three parts are related to shale gas drilling; part four, *Aging Pipes, Deadly*

**Hazards**, is concerned with the thousands of miles of antiquated, leak-prone, cast-iron pipelines running under the streets of Pennsylvania cities and towns, some more than 100 years old, and does not reference Marcellus Shale drilling. ([http://www.philly.com/philly/news/special\\_packages/inquirer/marcellus-shale/134705168.html](http://www.philly.com/philly/news/special_packages/inquirer/marcellus-shale/134705168.html))

- Part one, **Powerful Pipes, Weak Oversight**, noted that pipelines in Pennsylvania are poorly regulated and in many cases **non**-regulated. *“Pennsylvania’s regulators don’t handle those [Marcellus Shale] pipelines, and acknowledge they don’t even know where they are. In Pennsylvania’s shale fields, where the giant Marcellus strike has unleashed a furious surge of development, many natural gas pipelines today get less safety regulation than in any other state in America, an Inquirer review shows. Hundreds of miles of high-pressure pipelines already have been installed in the shale fields with no government safety checks – no construction standards, no inspections, and no monitoring. ‘No one – and absolutely no one – is looking,’ said Deborah Goldberg, a lawyer with Earthjustice, a nonprofit law firm focusing on the environment. Belatedly, the state’s elected officials and regulators are trying to catch up. The legislature is poised to give the state Public Utility Commission authority to enforce federal safety rules in the shale regions, as in other gas-producing states. Still, because of a long-standing gap in the federal rules, the new law would leave many gas pipelines unregulated over vast swaths of rural Pennsylvania, especially in the very shale regions that are ground zero for pipeline construction. These new Marcellus Shale ‘gathering’ pipelines that connect to the wells are going unregulated, even though they are large-diameter, high-pressure pipes – as powerful and potentially dangerous as the transmission lines that cut across the continent.”* ([http://www.philly.com/philly/news/special\\_packages/inquirer/marcellus-shale/20111208\\_Gas\\_lines\\_proliferating\\_in\\_Pa\\_are\\_lightly\\_regulated.html](http://www.philly.com/philly/news/special_packages/inquirer/marcellus-shale/20111208_Gas_lines_proliferating_in_Pa_are_lightly_regulated.html))
- Part two of the Inquirer series, **Similar Pipes, Different Rules**, focuses on the stringent federal rules that must be followed by owners of interstate natural gas transmission pipelines, whereas owners of local “gathering” lines

**He (Bill Wilson) says the calculation that balances safety regulations against population numbers treats rural residents as ‘collateral damage.’**

(pipelines that lead from gas well fields to transmission lines) have practically no regulations, especially in rural areas, even though they are the same size (24 inches in diameter) and operate at even higher pressures (up to 1,440 pounds per square inch) than transmission lines. *“When the owners of the Tennessee natural gas pipeline decided to expand the pipe in the Marcellus Shale region of Pennsylvania’s northern tier, the federal safety rules they had to follow filled a book. For this interstate transmission line running north from the Gulf Coast, the regulations covered everything from the*

*strength of the steel to the welding methods to how deep the pipeline must be buried. Also in Bradford County, another company – Chesapeake Energy – is building a pipeline the same size as the Tennessee line, 24 inches in diameter. And it’s designed to operate at even higher pressure – up to 1,440 pounds per square inch. But for this line, in this rural section of shale country, there are no safety rules at all. Because the second line is classified as a ‘gathering’ pipeline, carrying gas from well fields to transmission lines, safety rules are less stringent. And because that line is in a rural area, it’s totally unregulated. Bill Wilson lives in neighboring Wyoming County, another crossroads for the new generation of powerful Marcellus gathering lines. He made a study of pipeline rules in his role as president of a group of landowners who negotiated gas and pipeline leases. He says the calculation that balances safety regulations against population numbers treats rural residents as ‘collateral damage.’ ‘It’s all about money. You know that as well as I do,’ he said. This loophole in the law, a legacy of the industry’s influence in Washington, has been evident for decades, but the mighty Marcellus gas strike in Pennsylvania has changed the rules. The new wells, using the technique of hydraulic fracturing, generate tremendous torrents of gas that need big pipes, running at pressures far greater than traditional gathering lines. That has **federal regulators and some members of Congress** once again pushing to extend safety rules to the 200,000 miles of gathering lines in rural America – **with gas and pipeline companies pitted against them.**”* ([http://www.philly.com/philly/news/special\\_packages/inquirer/marcellus-shale/20111211\\_Similar\\_Pipes\\_Different\\_Rules.html](http://www.philly.com/philly/news/special_packages/inquirer/marcellus-shale/20111211_Similar_Pipes_Different_Rules.html))

- Part three, **'Us vs. Them' in Pa. Gaslands**, discusses the “hardball” tactics that the gas industry has used against municipalities and state residents who oppose the industry’s plans for massive pipeline placement all across Pennsylvania. *“In what is shaping up as a key victory for the shale-gas industry, Gov. Corbett and the legislature appear close to stripping municipalities of the power to impose tough local restrictions on wells and pipelines. Under a pending measure, wells and pipelines would be permitted in every zoning district – even residential ones – statewide. And the industry isn’t stopping there. Two pipeline companies are seeking the clout of eminent domain. While the Pennsylvania Public Utility Commission has yet to rule, it signaled this year that it was leaning toward giving firms condemnation power to gain rights-of-way for their pipelines.”* The article also references a court case in Westmoreland County in which Range Resources successfully filed suit to strike down the drilling and pipelines ordinance in Salem Township. The court case, said Township Solicitor Gary Falatovich, **“did a really good job of dismantling every modest control that the township was trying to impose.”** ([http://www.philly.com/philly/news/special\\_packages/inquirer/marcellus-shale/20111212\\_Us\\_vs\\_Them\\_in\\_Pa\\_Gaslands.html](http://www.philly.com/philly/news/special_packages/inquirer/marcellus-shale/20111212_Us_vs_Them_in_Pa_Gaslands.html))
- A related **Philadelphia Inquirer** article, ***Environmentalists and Sportsmen Raise Alarm Over Pipelines***, details concerns over the environmental impacts of pipelines on the state’s streams and forests. *“As natural gas companies ramp up their pipeline work in rural Pennsylvania, environmentalists and sportsmen have been raising alarms about the effects on the landscape. They worry about construction mud clogging waters and disrupting fish spawning, and about pipeline rights-of-way cutting swaths through forests, destroying treetop canopies. ‘We’re really early in this process,’ said Katy Dunlap, eastern water project director for Trout Unlimited, a national conservation organization. ‘What is going to be the impact of the loss of the forest? On quality of water?’ In Pennsylvania, the new, powerful ‘gathering’ lines in the Marcellus Shale regions receive almost no safety regulation. But the pipeline owners do need permits from DEP, the Army Corps of Engineers if the lines cross streams, and other agencies, a process meant to protect the*

**‘What is going to be the impact of the loss of the forest? On quality of water?’**

*environment and even cultural artifacts. Activists say the DEP is not reluctant to issue violations and impose fines. Still, the intense pace of pipeline development has left the agency struggling to keep up. ‘We don’t have enough inspectors to deal with the well pads,’ one DEP inspector said. ‘With the pipelines, it’s more linear and more challenging.’ Pipeline operators complain that the approval process can be cumbersome. David J. Spigelmyer, a Chesapeake Energy vice president and chairman of the Marcellus Shale Coalition trade group, said Army Corps of Engineers red tape had caused unnecessary delays in pipeline construction. William Seib, chief of the corps’ regulatory branch, based in Baltimore, disputed that. Typically, he said, permits are approved in an average of two months. ‘These companies are coming fast and furious,’ Seib said. ‘How much impact do you have to the system? It’s hard to say, because it’s moving so fast.’”* ([http://www.philly.com/philly/news/special\\_packages/inquirer/marcellus-shale/20111212\\_Environmentalists\\_and\\_sportsmen\\_raise\\_alarms\\_over\\_pipelines.html](http://www.philly.com/philly/news/special_packages/inquirer/marcellus-shale/20111212_Environmentalists_and_sportsmen_raise_alarms_over_pipelines.html))

- As has been discussed previously in this report, notably in the Pam Judy story, the Beth Voyles case and various reports in the “Toxic Chemicals” and “Human Health Impacts” sections, pipelines, compressor stations and various other components of shale gas drilling infrastructure have been identified as sources of airborne toxins and carcinogens that have been linked to various symptoms and diseases experienced by people living in proximity to shale gas drilling operations. (See also **Pittsburgh Post-Gazette** article ***EPA Probing Washington County Shale Operations***, cited in both “Toxic Air Emissions” and “Dissatisfaction with Regulatory Agencies” sections, for statement about compressor stations and airborne toxins.) (<http://shale.sites.post-gazette.com/index.php/news/archives/24317-epa-probing-washington-county-shale-operations>)

## ***Decrease in Property Values; Gas Lease Issues***

Landowners who are focused on the royalty checks they will receive for having leased their land to gas-drilling companies may not be aware that, by doing so, they are decreasing the value of their land. Recent investigations show that federal lending institutions consider gas wells to be hazards and will not issue mortgages for such properties and, in some cases, adjacent properties. Inevitably, this federal policy will expand to include smaller lenders and local banks, as has already occurred in some drilling areas. In addition, environmental damages that may result from drilling can further decrease a property's value.

**“Operating and abandoned oil and gas wells pose potential hazards to housing, including potential fire, explosion, spray and other pollution.”**

- Properties with wells on them are considered hazards by HUD/FHA (**see sections 2-5 to 2-7 and section 2-9 in the HUD Handbook**). *“FHA guidelines require that a site be rejected [for a mortgage] if the property being appraised is subject to hazards, environmental contaminants, noxious odors, offensive sights or excessive noises to the point of endangering the physical improvements or affecting the livability of the property, its marketability or the health and safety of its occupants (sec. 2-5).”* *“Operating and abandoned oil and gas wells pose potential hazards to housing, including potential fire, explosion, spray and other pollution. No existing dwelling may be located closer than 300 feet from an active or planned drilling site. Note that this applies to the site boundary, not to the actual well site (sec. 2-6).”* Thus an adjacent property with a dwelling within 300 feet of a property (property boundary) leased for drilling may be rejected for a mortgage. Sec. 2-7 discusses the presence of hydrogen sulfide emissions and slush pits and the effects on mortgages; sec. 2-9 discusses proximity to high pressure gas pipelines. These substances and activities are associated with natural gas drilling. Any property being actively drilled for natural gas or permitted for future natural gas drilling, and potentially adjacent properties as well, **are at risk for mortgage rejection.** (<http://www.hud.gov/offices/adm/hudclips/handbooks/hsg/4150.2/41502c2HSGH.pdf>)
- These federal lending restrictions have translated into reality in northeastern Pennsylvania, where drilling has been occurring for several years. In a June 2010 report in the **Pike County Courier**, mortgage broker Lori Rudalavage of Clarks Summit, PA, notes that *“there are a lot of properties with leases in this area,”* and when it comes to obtaining a mortgage on those properties, *“more and more of [the banks] are saying ‘no.’”* Rudalavage was told that **Wells Fargo** would not be inclined to fund a property with a gas lease. In a memo, a top executive for the bank stated that it would be *“very difficult to obtain*

financing due to the potential hazard. Also, if gas leasing is new to the area, there are too many unknowns,” one of them being what the lease would do to the “marketability of the property.” Jennifer Canfield, a real estate broker in the Upper Delaware Valley, reports that one of her customers was turned down for a home equity loan by GMAC because their property was under a gas lease. Canfield cites a long list of banks that won’t fund leased properties, based upon environmental risk. (Wells Fargo and GMAC are two of several banks and lending institutions listed in the article *Homeowners and Gas Drilling Leases: Boon or Bust?* that no longer fund gas-leased properties.) When it comes to selling leased land, Canfield says: “Even if sellers want to hand over the revenue derived from a future well, the clientele I’ve always relied upon don’t care to come here for that. In my own case, the phone stopped ringing when it became widely known how many thousands of acres were signed up.” ([http://www.uppermon.org/news/Other/PCC-No\\_Mortgage-8June10.html](http://www.uppermon.org/news/Other/PCC-No_Mortgage-8June10.html)) (<http://www.nysba.org/AM/Template.cfm?Section=Home&ContentID=57132&Template=/CM/ContentDisplay.cfm>)

- The **Pittsburgh Business Times** reports that Marcellus Shale drilling has had a “mixed bag” of effects on real estate values. While the influx of out-of-state workers employed by the drilling industry has created an increase in the sale of new homes and houses being rented by workers, the Business Times concurs with other reports of decreased property values for leased properties. “In areas that have seen shale drilling before western Pennsylvania, whether it’s in Texas, Ohio or the eastern part of the state, some property owners are finding their homes and land have suffered steep reductions in value, according to various press reports. Others have noted that residential real estate agents have often found it difficult to get mortgages for homes that have either

**“Bankers are concerned because many leases allow drillers to operate in ways that violate rules in landowners’ mortgages. These rules also require homeowners to get permission from their mortgage banker before they sign a lease — a fact that most landowners do not know.”**

experienced or suffered damages from shale gas extraction.” Furthermore, the report references federal lending restrictions: “The **Department of Housing and Urban Development** and the **Federal Housing Administration**, both major backers of the private mortgage market, have very specific restrictions in regards to lending for homes in proximity to gas wells.”

A specific problem with selling a local leased property was also mentioned. Dave McConnell, a principal of RE/MAX Premiere Group, based in Upper St. Clair, saw the concern over the natural gas drilling issue crop up recently over a possible home sale in Kennedy Township. The seller of the \$100,000 home leased the property’s subsurface rights to Dale Resources, which works with Chesapeake Energy, a company active in drilling for natural gas in the region. “When my buyers found that out, they almost walked away from the contract,” McConnell said. “It’s making buyers skittish.” McConnell

also sees a lot of residential real estate agents untrained and unprepared for the issues arising out of natural gas drilling rights and its impacts. “I’m seeing a lot of potential for bad things happening for agents that don’t understand this,” he said. “I’m seeing a legal nightmare for a lot of agents.” (<http://www.bizjournals.com/pittsburgh/print-edition/2011/02/25/shale-effect-on-home-values.html?page=all>)

- The **Denton (TX) Record Chronicle** reported in September 2010 that the home and 10-acre horse property of Tim and Christine Ruggiero had been **reduced in value from \$257,330 to \$75,240**. “The **Wise County Central Appraisal District Appraisal Review Board** — five community members with varying expertise in real estate — agreed that the drilling company’s use of the Ruggieros’ land warranted the extraordinary reduction.” The article cites “a litany of environmental problems” that led to the 75% decrease in property value. (Story now found on [dallasnews.com](http://www.dallasnews.com/incoming/20100918-Drilling-can-dig-into-land-value-9345.ece)) (<http://www.dallasnews.com/incoming/20100918-Drilling-can-dig-into-land-value-9345.ece>)

- In a report from Bradford County, PA, PA DEP officials encouraged Jared and Heather McKikens to evacuate their home, which was contaminated with **explosive levels of methane gas** as a result of nearby natural gas drilling activity. Their well water was also polluted. **Their home and property value has plummeted 85%, from \$250,000 to a value now appraised at \$35,000.** Mr. McKikens said, “*When your house does not have fresh water it’s pretty much worthless.*” The story of the McKikens can be viewed on the **Pennsylvania House Democratic Caucus** pahousevideo’s Youtube Channel via the Protecting Our Waters website: (<http://protectingourwaters.wordpress.com/2011/02/24/drilling-pollutes-bradford-county-pennsylvania-familys-home-and-groundwater/>)
- A related issue recently uncovered by both the **New York Times** and New York state attorney **Elisabeth N. Radow** is the potential conflict between the terms of home mortgages and the terms of gas leases. Simply stated, most home mortgages prohibit hazardous substances and activities that gas leases permit. As stated in the **New York Times** article, ***Rush to Drill for Natural Gas Creates Conflicts with Mortgages***, “*Bankers are concerned because many leases allow drillers to operate in ways that violate rules in landowners’ mortgages. These rules also require homeowners to get permission from their mortgage banker before they sign a lease — a fact that most landowners do not know.*” (<http://www.nytimes.com/2011/10/20/us/rush-to-drill-for-gas-creates-mortgage-conflicts.html?pagewanted=all>)
- In her in-depth article, ***Homeowners and Gas Drilling Leases: Boon or Bust?*** published in the **New York State Bar Association Journal**, attorney Elisabeth N. Radow writes: “*Signing a gas lease without lender consent is likely to constitute a mortgage default. At any time before or after the drilling begins, a lender can demand the borrower to either terminate the lease or pay off the loan. Since the gas companies have pledged the gas leases as collateral for loans or brought in investors based upon the potential income the gas lease can*

**“There is inherent risk of incurring significant environmental costs and liabilities in our operation due to our generation, handling and disposal of materials, including waste and petroleum hydrocarbons.**

*produce, facilitating a lease termination may require protracted litigation. Further, it is not likely that most homeowner-borrowers will have the ready cash to repay the loan. This places the lender in an untenable position.”* (pg. 20) (<http://www.nysba.org/AM/Template.cfm?Section=Home&ContentID=57132&Template=/CM/ContentDisplay.cfm>)

- Another related issue is homeowner’s insurance and coverage for environmental damage caused by drilling. **Drilling companies are often under-insured for such damage.** As stated in **Chesapeake Energy’s 2010 Form 10-K to investors**: “*There is inherent risk of incurring significant environmental costs and liabilities in our operation due to our generation, handling*

*and disposal of materials, including waste and petroleum hydrocarbons. We may incur joint and several liability, strict liability under applicable U.S. federal and state environmental laws in connection with releases of petroleum hydrocarbons and other hazardous substances at, on, under or from our leasehold or owned properties, some of which have been used for natural gas and oil exploration and production activities for a number of years, often by third parties not under our control. For our non-operated properties, we are dependent upon the operator for operational and regulatory compliance. While we maintain insurance against some, but not all risks described above, our insurance may not be adequate to cover casualty losses or liabilities, and our insurance does not cover penalties or fines that may be assessed by a governmental authority. Also, in the future we may not be able to obtain insurance at premium levels that justify the purchase.”* (pg.20) Radow cites **Bank of America, Wells Fargo and GMAC** among national lenders hesitant to grant mortgages to gas-leased properties. “*Once lenders connect the ‘no hazardous activity’ clause in the mortgage with the mounting uptick in uninsurable events from residential fracking, this policy can be expected to expand.* Originating lenders with gas industry business relationships may decide to assume the risk, make mortgage loans to homeowners with gas leases and keep the non-conforming loans in their own loan portfolio. However, there is a limit to what an originating

bank can keep in its own loan portfolio. Eventually, cash infusions from the secondary mortgage market will become a necessity; and secondary mortgage market lending guidelines will be a reality. If homeowners with gas leases can't mortgage their property, they probably can't sell their property either (this assumes the purchaser will need mortgage financing to fund the purchase). **The inability to sell one's home may represent the most pervasive adverse impact of residential fracking.**" (pg.21) (<http://www.nysba.org/AM/Template.cfm?Section=Home&ContentID=57132&Template=/CM/ContentDisplay.cfm>)

- Both the **New York Times** article *Learning Too Late of the Perils in Gas Well Leases* and the **Environmental Working Group** report *Drilling Doublespeak* discuss the discrepancies between what drilling companies tell their shareholders and what they tell landowners who are leasing their land. According to the **New York Times** article: "Under federal law, oil and gas companies must offer investors and federal regulators detailed descriptions of the most serious environmental and other risks related to drilling. **But leases typically lack any mention of such risks.**" The **Environmental Working Group** report states: "Federal law, enforced by the U.S. Securities and Exchange Commission, aims to protect investors against fraud by requiring companies that sell stock to disclose 'the most significant factors that make the offering speculative or risky.'" But, "according to landowners, attorneys and industry documents, **gas drillers paint a far more benign picture in the millions of unregulated transactions in which they persuade landowners to lease their property for drilling in exchange for a share of the proceeds.**" (<http://www.nytimes.com/2011/12/02/us/drilling-down-fighting-over-oil-and-gas-well-leases.html?pagewanted=all>) ([http://static.ewg.org/pdf/Drilling\\_Doublespeak.pdf](http://static.ewg.org/pdf/Drilling_Doublespeak.pdf))

**“Under federal law, oil and gas companies must offer investors and federal regulators detailed descriptions of the most serious environmental and other risks related to drilling. But leases typically lack any mention of such risks.”**

- According to the **New York Times** article *Officials Push for Clarity on Oil and Gas Leases*, the concern over this conflict between leases and mortgages has reached the federal level. "Federal lawmakers, bank regulators and law enforcement officials are broadening their efforts to ensure that the growing number of oil and gas leases being signed by landowners across the country comply with mortgage rules and do not create new risks for lenders, appraisers or landowners." (<http://www.nytimes.com/2011/11/25/us/officials-push-for-clarity-on-oil-and-gas-leases.html?pagewanted=all>)
- **Doug Shields** had these comments about gas lease issues: "**It is gross negligence not to inform the public of the hazards of leasing; [not] to put consumer protections in place, or [not] to advise local officials of leases signed or permits granted.**

*The fact that PA's Attorney General's office did not initiate consumer public education programs on matters of leasing (as did the AG of Maryland) speaks volumes as to where their interests lie. First, they unleashed the sub-prime lenders on an unsuspecting public and you see where that got us. Now they unleash landmen, gas leases in hand, upon a public that has not a clue as to what they may be getting themselves into when they sign."*

# Accidents, Spills, Blowouts and Fires

In his April 2011 letter to Governor Corbett, **Bradford County Commissioner Mark W. Smith** speaks in general terms of “*emergency responders... working at a breakneck pace to respond to immense traffic accident increases, well site accidents and other related issues.*”

**A chemical spill or illegal dumping of toxic waste-water would have a greater potential impact on Butler Township’s municipal water supply than would a contaminated groundwater aquifer.**

- **Comments from the gas industry about the hazards and risks of hydraulic fracturing** from their **10-K forms** are included at the end of the “General Statements” section.
- Spills and leaks of hydraulic fracturing chemicals and toxic waste-water, and illegal dumping of the latter, have led to incidents of soil and surface water contamination in the Commonwealth. The article *Natural Gas Drilling Hazards Not Always Underground* discusses numerous spills, leaks and contamination incidents described in **PA DEP** documents. Surface water contamination has led to increased bromide levels in municipal drinking water supplies (**Pittsburgh Post-Gazette** article *Bromide: A Concern in Drilling Wastewater*; **PublicSource.org** article *Salts from Drilling Still Showing Up in Rivers*) and illnesses, fatalities and birth defects to livestock (**StateImpact** article *Burning Questions: Quarantined Cows Give Birth to Dead Calves*). A chemical spill or illegal dumping of toxic waste-water would have a greater potential impact on Butler Township’s municipal water supply than would a contaminated groundwater aquifer. If the commissioners do consider a ban, they would do well to consider “toxic trespass” language in that ban, since the township’s drinking water originates in another municipality (reservoirs in Oakland Township). (<http://standardspeaker.com/news/natural-gas-drilling-hazards-not-always-underground-1.857215#axzz1ZYdp8EHF>) (<http://www.post-gazette.com/stories/news/environment/bromide-a-concern-in-drilling-wastewater-212188/>) (<http://publicsource.org/shared-sources/salts-drilling-drinking-water-danger-still-showing-rivers>) (<http://stateimpact.npr.org/pennsylvania/2011/09/27/burning-questions-quarantined-cows-give-birth-to-dead-calves/>)
- The contamination incident referenced in *Burning Questions: Quarantined Cows Give Birth to Dead Calves* occurred in Shippen Township, Tioga County PA. The incident occurred when drilling waste water from a large storage pond leaked through its plastic liner and flowed onto a cow pasture. In addition to the effects on the cattle who apparently drank the contaminated water (see under “Health Effects on Pets, Livestock and Wildlife”), the spill **killed all vegetation** in an area 30 feet by 40 feet. The **PA DEP** fined **East Resources** more than \$36,000 for the incident. (<http://stateimpact.npr.org/pennsylvania/2011/09/27/burning-questions-quarantined-cows-give-birth-to-dead-calves/>)



- On Feb. 23, 2011, vapors originating from a series of holding tanks at a natural gas drilling site in **Avella, Washington County** triggered a fire and explosion that seriously injured three workers. In May 2011, **Chesapeake Energy** was fined \$188,000 for that fire. (see *Chesapeake Energy Fined \$1.1 Million for Methane Migration and Tank Fire in PA* [i.e., two separate incidents] under “Groundwater Contamination.”) (<http://marcellusdrilling.com/2011/05/chesapeake-energy-fined-1-1-million-for-methane-migration-and-tank-fire-in-pa/>)
- The **Pittsburgh Post-Gazette** article *Burning Questions at Gas Well* relays the story of volunteer firefighters unsure of how to tackle a blaze at a Marcellus Shale well in Moundsville, WV in June 2010. According to the Marcellus Shale Advisory Board report on emergency management, Butler Township firefighters are being trained in how to deal with Marcellus Shale well fires. This, then, may not be an issue for Butler Township. (<http://www.post-gazette.com/stories/local/region/burning-questions-at-gas-well-250307/>)
- In June 2010, a **natural gas well blowout** in Clearfield County PA from a well owned by **EOG Resources** (formerly **Enron**) shot natural gas and wastewater into the open for **16 hours**. **PA DEP** stated that safety issues were ignored prior to the blowout. Former DEP Secretary John Hanger said at the time: *“Make no mistake, this could have been a catastrophic incident. Had the gas blowing out of the well been ignited, the human cost would have been tragic, and had an explosion allowed this well to discharge wastewater for days or weeks, the environmental damage would have been significant.”* A nearby stream was contaminated. This blowout occurred despite **three state inspections** of the well in January, February and March 2010. EOG Resources and its contractor, **C.C. Forbes LLC**, agreed to

**“Make no mistake, this could have been a catastrophic incident. Had the gas blowing out of the well been ignited, the human cost would have been tragic, and had an explosion allowed this well to discharge wastewater for days or weeks, the environmental damage would have been significant.”**

corrective action and to pay a combined \$400,000 in fines. (<http://www.questia.com/library/1P2-25359187/dep-says-safety-issues-ignored-in-clearfield-count>)

- **In April 2011, thousands of gallons of natural gas drilling waste fluids** spilled onto a farm and streams for **more than 12 hours** after the Atgas 2H well operated by **Chesapeake Energy Corp.** in LeRoy Twp., Bradford County, blew out during the hydraulic fracturing process. Officials on site described the leak as originating from below the frack valve stack, an above-ground piece of equipment that controls pressure during the fracking process. *“Evidently the crack is in the top part of the well below the blowout preventer,”* Skip Roupp, the deputy director of the **Bradford County Emergency Management Agency** said, referring to a device used in emergency situations to choke off flow from a well. In June 2011, an **EPA** investigation revealed contamination in three private water wells near the April blowout site. This led to the request for a “health consultation” by the **U.S. Agency for Toxic Substances and Diseases Registry (ATSDR)** noted in the “Health Impacts” section. (<http://thetimes-tribune.com/news/gas-drilling/after-blowout-most-evacuated-families-return-to-their-homes-in-bradford-county-1.1135253>) (<http://stateimpact.npr.org/pennsylvania/2012/02/09/bradford-county-blow-out-costs-chesapeake-more-than-200000/>)
- In January 2012, **hydraulic fracturing of an oil well** in southern Alberta could have caused an **oil well blowout a kilometer away**, according to provincial regulators. *“We don’t know the details yet . . . but my understanding is that it appears the fracturing process affected the other well,”* said an ERCB spokeswoman, Cara Tobin. According to a report in the **Calgary Herald**, fluids blasted deep into the earth under high pressure appear to have intersected underground with the second well, forcing oil up through the well bore at explosive rates. *“The incident could have*

*repercussions around North America as the industry grapples with rising public discontent over rapidly increasing use of the technology [hydraulic fracturing] to unlock shale gas and oil reserves.”* (<http://www.calgaryherald.com/technology/Update+Fracking+blamed+well+blowout/7688805/story.html>)

- A February 2012 **Pittsburgh Post-Gazette** article reports that a leaking two-inch pipe carrying oily condensates from a fracking operation at a **Chevron-Appalachia** Marcellus Shale well in Robinson, Washington County, has become a much bigger problem than the company and state regulators thought when it was discovered ten weeks previously. The leak from a faulty pipe joint weld buried four feet under the well pad was discovered by the company and reported to the state **Department of Environmental Protection** on Dec. 20. At the time, Chevron thought it had spilled about two barrels, or about 100 gallons, and told the DEP it was a minor incident and under control. But the DEP said Chevron now estimates that **as much as 80 barrels, or 4,000 gallons, of condensate -- also known as “wet gas” -- leaked from the pipe between Nov. 8, when the well fracking began, and its discovery 42 days later.** “*We’re still in the process of assessing the damage caused by this leak,*” Trip Oliver, a Chevron spokesman, said Monday. “*When you have a leak in an underground condensate line, the assessment is not as simple as if the leak was above ground.*” (<http://old.post-gazette.com/pg/12059/1213129-503-0.stm?cmpid=marcellusshale.xml>)
- According to a March 2012 **Pittsburgh Tribune-Review** article, shale-drilling company **EQT Corp. spilled 480 gallons of diesel into Patterson Run** in Center and Morris townships, Greene County in December, 2011, unbeknownst to local officials. The spill came to light nearly three months later because **the DEP is not required**

**As much as 80 barrels, or 4,000 gallons, of condensate — also known as “wet gas” — leaked from the pipe between Nov. 8, when the well fracking began, and its discovery 42 days later.**

**to notify local municipalities or alert the public of such accidents.** However, officials in Center and Morris said they should have been notified by either the DEP or the drilling company. “*Absolutely ... the township and the fire department should have been notified of that in case it was a problem,*” said Edward “Butch” Deter, chairman of the township’s board of supervisors, who is also president of the Center Township Volunteer Fire Department, Co. 91. ([http://triblive.com/x/pittsburghtrib/news/regional/s\\_785151.html#axzz2HAwLAgAn](http://triblive.com/x/pittsburghtrib/news/regional/s_785151.html#axzz2HAwLAgAn))

- **Illegal dumping of hazardous wastes** is also a problem related to natural gas drilling. For example, in a December 2011 **Elmira (NY) StarGazette** report, a 27-year-old man from Temple, Ga., admitted to Pennsylvania State Police that he **dumped approximately 800 gallons of dangerous materials** from a Bradford County gas well site onto state game lands. He was charged with “*scattering rubbish*” and was arraigned before District Justice Jonathan Wilcox of Troy, PA. (<http://www.stargazette.com/article/20111201/NEWS01/112010437/UPDATE-Man-charged-spill-near-Pa-gas-drilling-site> ) Numerous other incidents can be found by searching for “*illegal dumping -- natural gas*” on Google.
- Articles from **Earthworks** and **USA Today** re: natural gas well blowouts also included. (<http://responsiblegold.com/clarkwyoming.cfm>) ([http://usatoday30.usatoday.com/news/nation/2011-03-05-onshore-oil-blowouts\\_N.htm](http://usatoday30.usatoday.com/news/nation/2011-03-05-onshore-oil-blowouts_N.htm))

## Environmental/Safety Violations

As stated in the **Scranton Times-Tribune** article about the Bradford County blowout, **Chesapeake Energy**, one of the state's most active Marcellus Shale drillers, had been issued **30 notices of violations from the DEP** for its operations in the state between January and March 2011. The company had been cited **284 times** for violations since the start of 2008 and had been subject to **58 enforcement actions by environmental regulators**, according to DEP records at the time of the blowout.

- In another **Times-Tribune** article from September 2011, it is reported that **violations for faulty cement well casings** for the period of January–August 2011 **had already exceeded the number of violations for all of 2010**, this despite the statement by **Chesapeake Energy** CEO Aubrey McLendon: *“Problem identified, problem solved”* regarding that issue which continues to plague the Marcellus Shale gas industry. Faulty well casings are the primary culprit in cases of contaminated aquifers. (See article **DEP Inspections Show More Shale Cement Problems** in the “Groundwater Contamination” section.)
- The **Pittsburgh Business Times**, **FracTracker.org** and **Stateimpact.org** all provide Marcellus Shale violations databases with information provided by the **DEP**. Some discrepancies have been noted between the Pittsburgh Business Times’ data and that of Stateimpact, with the latter showing lower numbers. The Business Times’ database page (<http://www.bizjournals.com/pittsburgh/datacenter/search-all-marcellus-shale-violations.html>) has not been updated since June 2011; however, Business Times reporter Anya Litvak has updated the data in individual articles. One article cites a rise in Marcellus Shale violations in western Pennsylvania for the period of June 1–Oct. 31, 2011. (<http://www.bizjournals.com/pittsburgh/blog/energy/2011/11/marcellus-violations-rise-in-region.html>)
- A cursory glance at the “administrative violations” sample pages reveals that not all of these violations are merely “missing paperwork;” some are violations occurring “in the field” which are inexplicably designated as “administrative.” Anya Litvak explores one such case in the **Business-Times** article **Chief’s \$180,000 Marcellus Violation Classified As Administrative**. The violation (two violations, actually) were for a hydraulic oil spill and for failing to properly maintain a drill pit at a Marcellus Shale natural gas well in Jefferson Township, Somerset County. The article cites other “**administrative**” **violations that clearly relate to environmental hazards**; for example, administrative violation code 78.86: *Failure to report defective, insufficient, or improperly cemented casing w/in 24 hrs or submit plan to correct w/in 30 days*, where inspectors’ comments repeated: **“Constant bubbling in cellar”** and **“uncontrolled release of gas.”**
- Or violation code: 691.1: *Clean Streams Law – General*. On April 15, an inspector visiting a Cabot Oil and Gas well in Susquehanna County recorded that: *“Sampling analytical results showed elevated As (Arsenic) in soil and elevated As, Mn (Manganese), Chloromethane & Tetrachloromethane in liquid fraction of spilled material.”* No explanation was given in the article as to why these violations are classified as “administrative;” the article’s primary purpose was to show that administrative violations are not always necessarily a failure to submit the proper paperwork. (<http://www.bizjournals.com/pittsburgh/blog/energy/2011/06/chiefs-180000-marcellus-violation-admin.html>)
- A **Business-Times** article from Aug. 2011 reports that a **DEP** team investigating how Marcellus Shale violations are reported discovered a discrepancy in the reporting of violations between the northeastern and southwestern regions. Over the past three and half years, southwestern Pennsylvania wells have consistently averaged less than

half the violations per wells drilled as the rest of the state. The team has identified two major drivers contributing to a higher per-well violation count in the northeast. If a well site is found to be in violation of more than one environmental law, **inspectors in the northeast are more likely to issue identical violations for each law the company is violating**, while **southwestern DEP staff are likely to record that as one breach**.

Similarly, southwestern inspectors tend to interpret a spill or other impact at a well site as one violation, regardless of how many wells have been drilled from the same well pad. **In the northeastern part of the state, inspectors are issuing as many violations as there are holes in the ground at each well site.** The team's findings have gone to DEP Secretary Michael Krancer for evaluation, but no action or directive has been issued yet to streamline the violations process. (<http://www.bizjournals.com/pittsburgh/print-edition/2011/08/19/marcellus-shale-well-violations.html>)

- **FracTracker.org**, a public service provided by the **Heinz Endowments**, has many features related to Marcellus Shale drilling. One recent feature combines the DEP data for violations-per-well by operator over the past two years (2010-2011) to discover who are the truly "bad actors" of the industry in Pennsylvania. Of local interest is the exceptionally poor violations-per-well ratio for **XTO**, which in June 2011 purchased the local drilling company **Phillips Exploration**. Of general interest is the next-worse violations-per-well ratio, belonging to **Cabot Oil and Gas**, the drilling company involved with the **Dimock contamination incident**. (<http://www.fractracker.org/>)
- According to the **Pittsburgh Business-Times Marcellus Shale violations database**, there were **over 2,100 environmental/safety violations statewide** between January 2008 and May 2011.

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- An in-depth analysis of DEP data by the **PennEnvironment Research and Policy Center**, "*Risky Business: An Analysis of Marcellus Shale Gas Drilling Violations in Pennsylvania 2008-2011*," identified a total of **3,355 violations of environmental laws by 64 different Marcellus Shale gas drilling companies** between January 1, 2008 and December 31, 2011. Of these violations, the Center identified **2,392 violations that likely posed a direct threat to the environment and were not reporting or paperwork violations**. The Center "*believes these numbers offer a conservative view of environmental violations taking place across the Commonwealth by Marcellus Shale gas drilling companies*."

*This data only includes violations discovered by PADEP's enforcement staff. Yet based upon the number of wells drilled and limited PADEP enforcement staff, further violations that have gone undetected are likely.*" The greatest numbers of environmental violations were related to improper erosion and sedimentation plans: 625 (26% of all violations likely to impact the environment). The second greatest number involved faulty pollution prevention techniques: 550 (23% of violations likely to impact the environment). According to the report: "*This analysis demonstrates that Marcellus Shale gas drilling companies are either unable or unwilling to comply with basic environmental laws that have been put in place to protect the health and environment of Pennsylvanians. This points to a need for state leaders to halt additional shale gas extraction through all legally viable means until and unless gas operators can prove the practice is safe for the environment and public health.*" Until that happens, the Center has recommended a number of policy revisions, including increasing mandatory minimum penalties for polluters that violate our environmental laws, and putting areas that supply our drinking water, critical wildlife habitat and ecosystems, and our state forests and other public lands completely off limits to drilling. ([http://pennenvironmentcenter.org/reports/pac/risky-business-analysis-marcellus-shale-gas-drilling-violations-pennsylvania-2008-2011?\\_\\_utma=1.1592786639](http://pennenvironmentcenter.org/reports/pac/risky-business-analysis-marcellus-shale-gas-drilling-violations-pennsylvania-2008-2011?__utma=1.1592786639))

# Ground-water Contamination

The natural gas industry frequently claims: “*There has never been a proven instance of drinking water contamination caused by hydraulic fracturing.*”

That claim was shattered in December 2011 when the **U.S. EPA** reported that hydraulic fracturing had caused drinking water well contamination in Pavillion, WY. The industry, perhaps not unexpectedly, disputes this report.

**“Data suggest that enhanced migration of gas has occurred within ground water at depths used for domestic water supply.”**

- In December 2011, an EPA study of groundwater contamination in **Pavillion, WY** linked the contamination to hydraulic fracturing in the area. “*When considered together with other lines of evidence, the data indicates likely impact to ground water that can be explained by hydraulic fracturing,*” the draft study said. The study also said that “*data suggest that enhanced migration of gas has occurred within ground water at depths used for domestic water supply.*” (<http://www.propublica.org/article/epa-finds-fracking-compound-in-wyoming-aquifer>) (<http://www.epa.gov/region8/superfund/wy/pavillion/PavillionCommunityPresentation09Nov2011.pdf>)
- A **New York Times** article, *A Tainted Water Well, and Concern There May Be More* (Aug. 2011 – see “Non-Disclosure Agreements” section), cites a **1987 EPA report** of a water well contaminated by hydraulic fracturing fluid in West Virginia. The EPA report suggests there may have been more such incidents, but researchers were unable to investigate many suspected cases because their details were sealed from the public when energy companies settled lawsuits with landowners. ([http://www.nytimes.com/2011/08/04/us/04natgas.html?\\_r=4&hp&pagewanted=all&](http://www.nytimes.com/2011/08/04/us/04natgas.html?_r=4&hp&pagewanted=all&))
- Even before these reports surfaced, as stated in the article *Natural Gas Industry Rhetoric vs. Reality* (see “General Statements” section): “*There is no doubt that water contamination has resulted from natural gas practices. By crafting its argument around hydraulic fracturing specifically and not natural gas drilling more generally, [the] industry is hiding behind technicalities to obscure its documented role in contaminating drinking water supplies. It is referring only to a precise moment that occurs within a much larger industrial process.*” (<http://www.desmogblog.com/natural-gas-industry-rhetoric-versus-reality>)
- The **PA DEP** report *Stray Natural Gas Migration Associated with Oil and Gas Wells*, dated Oct. 28, 2009, lists several cases of stray gas migration in the state, many of which impacted private water supplies. Among the cases listed is the now-controversial **Dimock Twp.**, Susquehanna County case, about which the report states: “*Of particular note is that this area has not experienced previous drilling and recent gas drilling in the vicinity has targeted the Marcellus Shale.*” ([http://www.dep.state.pa.us/dep/subject/advoun/oil\\_gas/2009/Stray%20Gas%20Migration%20Cases.pdf](http://www.dep.state.pa.us/dep/subject/advoun/oil_gas/2009/Stray%20Gas%20Migration%20Cases.pdf))

- As mentioned previously in the “Dissatisfaction with Regulatory Agencies” section, the U.S. EPA in Dec. 2010 issued an “*imminent and substantial endangerment order*” against **Range Resources** to “*stop the contamination of Methane and Other Contaminants into the drinking water near multiple residences*” in southern Parker County, TX. Parker County is located west of Ft. Worth in the Barnett Shale drilling area of North Texas. Among the actions that EPA required of Range Resources was to “*develop a plan to remediate areas of the aquifer that have been contaminated.*” (<http://yosemite.epa.gov/opa/advpress.nsf/e8f4ff7f7970934e8525735900400c2e/713f73b4bdceb126852577f3002cb6fb!OpenDocument>)

- An April 2009 **ProPublica** article, co-published with the **Denver Post**, reports that investigations about methane contamination in Garfield County (CO) and other parts of the country have **clearly tied the contamination to energy development, strengthening arguments across the country that drilling can put drinking water at risk.** Near Cleveland, Ohio, a house exploded in late 2007 after gas seeped into its water well. The **Ohio Department of Natural Resources** later issued a **153-page report** that blamed a nearby gas well’s **faulty cement casing and hydraulic fracturing** for pushing methane into an aquifer and causing the explosion. In Dimock, Pa., where drilling recently began in the mammoth Marcellus shale deposit, several drinking water wells have exploded and nine others were found with so much gas that **one homeowner was told to open a window if he planned to take a bath.** In February 2009 the **Pennsylvania Department of Environmental Protection** charged **Cabot Oil & Gas** with two violations that it says caused the contamination, theorizing that **gas leaked from the well casing into fractures underground.**

The three-year **Garfield County Hydrogeologic Study** “*used sophisticated scientific techniques to match methane from water to the same rock layer -- a mile and a half underground -- where gas companies are drilling. The scientists didn’t determine which gas wells caused the problem or say exactly how the gas reached the water, but they indicated with more clarity than ever before that a system of interconnected natural fractures and faults could stretch from deep underground gas layers to the surface. They called for more research into how the industry’s practice of forcefully fracturing those deep layers might increase the risk of contaminants making their way up into an aquifer. It challenges the view that natural*

*gas, and the suite of hydrocarbons that exist around it, is isolated from water supplies by its extreme depth,*” said Judith Jordan, the oil and gas liaison for Garfield County who has worked as a hydrogeologist with DuPont and as a lawyer with Pennsylvania’s Department of Environmental Protection. **It is highly unlikely that methane would have migrated through natural faults and fractures and coincidentally arrived in domestic wells at the same time oil and gas development started, after having been down there ...for over 65 million years.”**

Drinking water with methane, the largest component of natural gas, isn’t necessarily harmful. The gas itself isn’t toxic, but it “*becomes dangerous when it evaporates out of the water and into peoples’ homes, where it can become flammable. It can also suffocate those who breathe it. According to the Agency for Toxic Substances and Disease Registry, a part of the U.S. Department of Health and Human Services, as the concentration of gas increases it can cause headaches, then nausea, brain damage and eventually death. The Garfield County report is significant because it is among the first to broadly analyze the ability of methane and other contaminants to migrate underground in drilling areas, and to find that such contamination was in fact occurring. It examined over 700 methane samples from 292 locations and found that methane, as well as wastewater from the drilling, was making its way into drinking water not as a result of a single accident but on a broader basis.*”

Geoffrey Thyne, a senior research scientist at the **University of Wyoming’s Enhanced Oil Recovery Institute** (a **pro-extraction** group) and the hydrogeologist who wrote the report’s summary and conclusion, said researchers had traced the origin of the gas by conducting the equivalent of a forensic investigation, analyzing its isotopic signature, or molecular fingerprint. The molecular structure showed that most of it was thermogenic, meaning it matched the deeply buried deposit where gas was being drilled, called the Williams Fork Formation. A minority of the samples were difficult to identify by this method, so Thyne used another scientific process to study them. He is confident they, too, were thermogenic in origin. In most cases, the study couldn’t pinpoint the exact pathway the contaminants had used to travel a mile and a half up into the drinking water aquifer. So Thyne could only reason the possibilities. The methane could be seeping into water wells through natural fractures, he said, or through leaks in the well casings or cement, or from the well heads. “*When a pipe*

*extends 8,000 feet below the earth's surface,"* he said, *"there are numerous potential leak points along the way. So is it leaking at 8,000 feet and coming up a well bore, a natural fault or fracture? Or is it leaking 500 feet from the surface? We don't know."* The most plausible explanation, Thyne said, is that **the same type of well casing and cementing issues that had proved problematic in Ohio and are suspected in Pennsylvania were presenting problems in Colorado too.** (<http://www.propublica.org/article/colorado-study-links-methane-in-water-drilling-422>)

- A peer-reviewed May 2011 study conducted by four scientists at **Duke University** found that levels of flammable methane gas in drinking water wells increased to dangerous levels when those water supplies were close to natural gas wells. They also found that the type of gas detected at high levels in the water was the same type of gas that energy companies were extracting from thousands of feet underground, strongly implying that the gas may be seeping underground through natural or manmade faults and fractures, or coming from cracks in the well structure itself. The group tested 68 drinking water wells in the Marcellus and Utica shale drilling areas in northeastern Pennsylvania and southern New York State. While most of the wells had some methane, the water samples taken closest to the gas wells had on average **17 times the levels detected in wells further from active drilling.** The group defined an active drilling area as within one kilometer, or about six tenths of a mile, from a gas well. The average concentration of the methane detected in the water wells near drilling sites fell **squarely within a range that the**

**"It examined over 700 methane samples from 292 locations and found that methane, as well as wastewater from the drilling, was making its way into drinking water not as a result of a single accident but on a broader basis."**

**U.S. Department of Interior says is dangerous and requires urgent "hazard mitigation" action,** according to the study. They were alarmed by what they described as a *"clear correlation between drilling activity and the seepage of gas contaminants underground, a danger in itself and evidence that pathways do exist for contaminants to migrate deep within the earth."* (<http://www.propublica.org/article/scientific-study-links-flammable-drinking-water-to-fracking>)

- Numerous other reports referenced in this report, notably the **Beth Voyles case** vs. the DEP, the ongoing struggle for clean water in **Dimock Twp., PA**, the ongoing controversy in **Connoquenessing Twp.** (see "Dissatisfaction with Regulatory Agencies"), the profound drops in property values noted in the cases of **Tim Ruggiero** and **Jared McKikens** (see "Decrease in Property Value") and the research of **Prof. Marc Durand** (see "Long-Term Environmental Effects") focus on the links between hydraulic fracturing operations and groundwater contamination.

## Toxic Air Emissions

“*Much has been written about the water concerns related to hydraulic fracturing around the country, but air pollution is a different, important pathway that can negatively impact public health yet it is rarely discussed.*”

– Calvin Tillman, former mayor of Dish, TX.

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**“In the northeast, drilling in Pennsylvania, West Virginia and beyond is threatening to undermine years of hard-earned progress in cutting air pollution.”**

- Air borne toxins and carcinogens associated with natural gas extraction and its associated infrastructure have been discussed previously in the “Chemicals,” “Health Impacts” and “Vulnerable Populations” sections of this report. The issue of **density** also comes into play, particularly in a densely populated area such as Butler Township. If, as is anticipated, the state takes away the township’s power to zone this activity, there will be no way to control the density of natural gas development in the township. Gas wells, flaring, processing plants, compressor stations, and pipelines are all potential sources of toxic air emissions, as are the increased diesel fumes from the heavy truck traffic servicing area gas wells. All of these factors will in all likelihood have a substantial negative impact on air quality in Butler Township.
- To recapitulate, airborne toxins from natural gas activities, including the emission of hydrogen sulfide, have been linked to **cancers, respiratory disorders (including increased asthma rates in young children), skin disorders, neurological disorders and endocrine disruption which can lead to the development of cancerous tumors**. In addition, the document *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas* notes that children, the elderly and individuals who are “chemically sensitive” are more at risk from these toxins than is the general population. ([http://www.earthworksaction.org/files/publications/EHRA\\_Human-rights-fracking-FINAL.pdf](http://www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf))
- According to one study (see *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas*, pg. 9, footnote #6), a strong association has been found between maternal exposure to airborne benzene and adverse birth outcomes such as spina bifida. ([http://www.earthworksaction.org/files/publications/EHRA\\_Human-rights-fracking-FINAL.pdf](http://www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf))
- A **National Public Radio** report states that Sublette County, WY (pop. 10,000), a wild, mountainous area an hour and a half from Grand Teton National Park, in March 2011, registered **higher ozone levels than any recorded in Los Angeles** for the entire year of 2010. State environmental officials acknowledge that massive natural gas fields in the area contribute to the problem. Residents complain of respiratory issues due to the high ozone levels. (<http://www.npr.org/2011/04/05/135135548/rural-wyo-countys-air-quality-rivals-l-a>)



- According to the **Environment and Energy (E&E) Publishing** publication **Land Letter**, in Oct. 2011 a coalition of Wyoming residents filed a notice of intent to sue the **U.S. EPA** unless the agency designated Sublette County and the Upper Green River Basin as a violator of federal ground-level ozone standards. The notice stated that the EPA was “*guilty of unlawfully delaying implementation of statutory protections to which all in Sublette County are entitled.*” The Sublette Examiner in Dec. 2011 reported that the EPA would move ahead on enacting “non-attainment status” for the area for ozone. The article further reported that Sublette County had “*ozone levels beyond that of any major U.S. city all last year [2010], according to EPA data,*” and that the EPA’s action would “*put added pressure on oil and gas companies in Sublette County to limit their emissions of pollutants.*” ([http://www.subletteexaminer.com/v2\\_news\\_articles.php?heading=0&page=72&story\\_id=1922](http://www.subletteexaminer.com/v2_news_articles.php?heading=0&page=72&story_id=1922))
- In the summer of 2011, both the **U.S. EPA and the federal panel investigating shale drilling** recommended stronger air pollution standards for oil and gas production. The recommendations were met with resistance from the industry. The EPA’s proposal is the culmination of a legal settlement reached between the agency and two environmental groups, **WildEarth Guardians** and the **San Juan [Colorado] Citizens Alliance**, committing the agency to update federal regulations limiting air pollution from oil and gas drilling operations nationwide. The article ***Drilling Pollution and Solutions*** from the WildEarth Guardians website discusses this settlement, and also mentions that “*in the northeast, drilling in Pennsylvania, West Virginia and beyond is threatening to undermine years of hard-earned progress in cutting air pollution.*” ([http://www.wildearthguardians.org/site/PageServer?pagename=priorities\\_climate\\_energy\\_wildskies\\_drilling\\_pollution\\_solutions](http://www.wildearthguardians.org/site/PageServer?pagename=priorities_climate_energy_wildskies_drilling_pollution_solutions))

**“Each stage of Marcellus Shale operations emits harmful air pollution and an emissions inventory is an essential tool to protect Pennsylvania’s air quality,”**

- At an EPA hearing on the matter in Pittsburgh in September 2011, Pittsburgh City Councilman Doug Shields testified that the new federal rules are needed because local, state and federal governments have so far failed to exercise appropriate control of the industry. “*This proposed rule represents only a start in efforts to preserve our rights as citizens, to preserve our health, welfare and safety. I endorse it. I do want to inform you that you are a decade late in doing so and there is so much more to be done. The horse is already out of the barn.*” (<http://www.post-gazette.com/stories/news/environment/epa-asked-to-improve-air-standards-at-marcellus-shale-wells-316806/>)
- In October 2011, the **PA DEP** instituted new state air quality regulations for natural gas drilling which “*de-emphasizes the inter-relatedness of oil and gas facilities.*” Only wells and associated development (compressor stations, pipelines, etc.) within a quarter-mile of each other could be treated as an “aggregate” or single source of air pollution. This **runs afoul of EPA guidelines** for such air quality regulations. According to a Dec. 2011 **Pittsburgh Post-Gazette** article, “*a broader geographic policy of aggregation consistent with the federal Clean Air Act would result in multiple gas development activities being treated as a single major source [of pollution], and as such it would require them to meet stricter emissions standards to prevent deterioration of existing air quality.*” While the new air quality regulations were applauded by the industry, they were criticized by the EPA and numerous environmental organizations. Thomas Au, conservation chair of the **Sierra Club Pennsylvania Chapter**, said the EPA should closely monitor the DEP’s permitting of Marcellus Shale development to ensure it is consistent with federal policies. “*If many gas industry sources of air pollution escape strict air pollution controls,*” Mr. Au said, “*the regional air quality would degrade. Eventually, whole counties would not attain the national ambient air quality standards.*” (<http://www.post-gazette.com/stories/opinion/editorials/rogue-regulation-pa-must-fall-in-step-with-legal-drilling-oversight-223500/>) (Unfortunately, the abbreviated article now available online does not contain many of the above quotes...)

- According to a Jan. 3, 2012 report in the **Pittsburgh Post-Gazette**, the **Pennsylvania Department of Environmental Protection** didn't notify several big companies involved in Marcellus Shale gas development that they must monitor and report emissions. An environmental organization, the **Clean Air Council**, said that could render an ongoing, federally mandated state air pollution inventory inaccurate.

According to state law, only those companies notified that emissions reports are necessary are required to submit reports. "Each stage of Marcellus Shale operations emits harmful air pollution and an emissions inventory is an essential tool to protect Pennsylvania's air quality," said Clean Air Council executive director Joseph Minott. The DEP could not be reached for comment about how it prepared the notifications list or whether companies not notified must provide inventories. The notified companies must submit emissions data to the DEP by March for carbon monoxide, nitrogen oxides, airborne particles or soot, sulfur dioxide, volatile organic compounds and total hazardous air pollutants. The DEP will compile the inventory and is required to submit it to the EPA by the end of 2012. The inventory is used by the EPA to ensure that air quality is maintained and doesn't deteriorate. The 2012 submission to the EPA is the first to include emissions data from Marcellus Shale drilling, production, processing and piping companies. (<http://www.post-gazette.com/stories/local/breaking/several-marcellus-shale-firms-left-off-pollution-reporting-list-215943/>)

- A Jan. 6, 2012 article in the **Pittsburgh Tribune-Review** reports that six gas processing plants proposed for a four-mile radius in Butler County would each produce air pollution just below the state limits that trigger the level of regulation large polluters get, according to Pennsylvania and industry officials. Each of the plants that **Keystone Midstream Services LLC** has proposed will emit an estimated maximum of 95 tons of carbon monoxide per year, which is 5 percent below the state's threshold for major pollution sources, like a steel mill or a food processing plant. That has allowed the Colorado company to get permits as minor polluters for two plants, with four others pending review, in Forward, Lancaster and Jackson townships. Critics say that's skirting environmental rules, but the company and the state **Department of**

**Environmental Protection** say it's legal. While Keystone's Wexford-based general manager Michael Brinkmeyer claims that each of the plants falls under the guidelines of both **the DEP and the EPA**, the article did not make clear whether or not the state guidelines being followed were those stated above, which do not meet federal guidelines for air quality regulations. Critics are concerned for the county's air quality. "My concern is not that individual sources are just under the major source threshold, it's that so many of these near-major sources are being permitted all at once," said Joe Osborne, legal director at the Garfield-based Group Against Smog and Pollution, which objected to the most recently approved permit, in Jackson. He said the DEP "isn't seeing the bigger picture. They're not accounting for the impact on air quality that results from having, say, a dozen new, near-major sources constructed in a single county in just one or two years." ([http://triblive.com/x/pittsburghtrib/news/regional/s\\_775271.html#axzz2HvNCxKp](http://triblive.com/x/pittsburghtrib/news/regional/s_775271.html#axzz2HvNCxKp))

- A February 2012 **Pittsburgh Post-Gazette** article, **EPA Probing Washington County Shale Operations**, reports that the EPA is and has been conducting a "multi-media" investigation of air, water and hazardous wastes impacts in Washington County PA in connection with specific Marcellus Shale drilling and compressor station operations. The article included this statement about compressor stations and toxic air contamination: "Emission of air pollutants by compressor stations -- including nitrogen oxides, sulfur dioxide, volatile organic compounds, airborne particulates and carbon monoxide -- are measured in hundreds of tons per year and have the potential to adversely affect the state's air quality." (<http://pipeline.post-gazette.com/news/archives/24317-epa-probing-washington-county-shale-operations>)

# Toxic Waste-water Disposal

*“Drilling waste-water contains hydrocarbons, heavy metals, radioactive materials, a range of additives such as BTEX chemicals and other toxins. It is considered hazardous waste and requires special handling, but there is as yet no clear agreement about how best to dispose of it.” (from *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas*)*

- In April 2011, the **PA DEP** called on companies drilling in the Marcellus Shale natural gas formation to **stop taking waste-water to 15 treatment plants** by May 19, citing **potentially unsafe drinking water**. The announcement came the same day that an **industry group** said it believed drilling waste-water was partly at fault for rising levels of bromide being found in Pittsburgh-area rivers. In other major gas-drilling states, drilling waste-water is kept out of rivers largely by injecting it deep underground into disposal wells. But in Pennsylvania, some drilling waste-water was treated by sewer authorities, largely in western Pennsylvania, and discharged into rivers. Those waste-water plants, however, were ill-equipped to remove all the pollutants, and Pennsylvania still allowed hundreds of millions of gallons of the partially treated waste-water to be discharged into rivers from which communities draw drinking water. The state Department of Environmental Protection cited elevated levels of bromide in rivers in western Pennsylvania in its announcement “to end this practice.” (<http://www.post-gazette.com/stories/local/marcellusshale/dep-asks-drillers-to-stop-disposing-wastewater-at-plants-294239/>)
- Another technique for disposal of toxic waste-water generated by hydraulic fracturing is the use of **deep injection wells**, in which the waste fluids are injected under pressure deep into the earth, usually into a sandstone or limestone formation. In 2011, this technique became both problematic and controversial. In Arkansas, the **Arkansas Oil and Gas Commission** ordered four natural gas disposal wells shut down and created a moratorium area preventing future disposal wells in a large swath of central Arkansas, a region where **more than 1,000 small earthquakes** have been recorded in about the last year. (<http://www.arkansasonline.com/news/2011/oct/05/more-quakes-felt-central-arkansas/>) A similar occurrence transpired near Youngstown, Ohio, where 11 earthquakes in 2011, including a 4.0 quake on Dec. 31, caused the **Ohio Department of Natural Resources** to shut down 5 injection wells within a 5-mile radius. ([http://www.timesonline.com/news/local\\_news/more-ohio-injection-wells-shut-down/article\\_89119f9e-122c-5512-9c73-b408673627cb.html](http://www.timesonline.com/news/local_news/more-ohio-injection-wells-shut-down/article_89119f9e-122c-5512-9c73-b408673627cb.html)) There was also a report of a leaking injection well in Clearfield County, PA that developed a breach or “failed mechanical integrity” in one of the piping, casing and cement layers of the 7,000-foot-deep disposal well. The **U.S. Environmental Protection Agency** fined **Exco Resources** \$159,624 for the leaking underground pipe at the well. (<http://old.post-gazette.com/pg/12003/1200922-503-0.stm?cmpid=healthscience.xml>)
- A March 2012 article in the **Glenwood Springs (CO) Post-Independent** focuses on Aaron Milton, a former “water handler” for a western Colorado drilling company. His work involved handling flowback or produced water. It is a mixture of the water found deep underground in association with oil and gas reservoirs, and the surface water that is pumped underground for hydraulic fracturing operations. He would often transfer produced water from one tank to another during the well drilling and completion processes. He said he quit his high-paying job because he felt his health was threatened and that his employer was too lax in its safety regulations. Milton questions the safety of a regular industry practice of using injection wells to dispose of produced water that cannot be used again for hydraulic fracturing, or fracking. “*The problem is, that is not classified as anything but water by the EPA,*” Milton noted. “*But that is not just water.*” He has started an online petition to pressure the **U.S. Environmental Protection Agency (EPA)** to reclassify produced water from gas wells as toxic waste. (<http://www.postindependent.com/article/20120310/VALLEYNEWS/120309875>)

## Seismic Activity

“*Any process that injects pressurized water into rocks at depth will cause the rock to fracture and possibly cause earthquakes. It is well-known that injection of water or other fluids during extraction processes such as shale gas can result in earthquake activity.*” – British Geological Survey

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- As stated in the section above, the deep-well injection method of disposing toxic fluid waste by-products from hydraulic fracturing has been linked to seismic activity. However, at least two reports link seismic activity to hydraulic fracturing itself. An **Oilprice.com** article from Nov. 2011 states that: “*On 2 November a report commissioned by **Cuadrilla Resources** acknowledged that hydraulic fracturing was responsible for two tremors which hit Lancashire and possibly as many as fifty separate earth tremors overall. The British Geological Survey also linked smaller quakes in the Blackpool area to fracking.*” The article also discusses **earthquakes in Oklahoma**. On Nov. 5, 2011, Oklahoma experienced a **5.6 earthquake – the strongest ever recorded in the state**. Until recently, Oklahoma averaged about 50 quakes a year, but in 2010, 1047 quakes shook the state. While the center of the seismic activity, Lincoln County, is home to 181 injection wells, a study of 43 earthquakes that occurred on Jan. 18, 2011 focused on hydraulic fracturing. In the report, “*Examination of Possibly Induced Seismicity from Hydraulic Fracturing in the Eola Field, Garvin County, Oklahoma*,” Austin Holland of the Oklahoma Geological Survey stated: “*Our analysis showed that shortly after hydraulic fracturing began small earthquakes started occurring, and more than 50 were identified, of which 43 were large enough to be located.*” (<http://oilprice.com/Energy/Natural-Gas/U.S.-Government-Confirms-Link-Between-Earthquakes-and-Hydraulic-Fracturing.html>)
- More earthquakes will occur despite the shut-down of the injection well on Ohio Works Drive in Youngstown, according to a seismologist investigating the quakes. In a report from the **Youngstown Vindicator**, John Armbruster, a seismologist at **Columbia University’s Lamont-Doherty Earth Observatory** in Palisades, N.Y. noted that “*the earthquakes will trickle on as a kind of a cascading process once you’ve caused them to occur. This one year of pumping is a pulse that has been pushed into the ground, and it’s going to be spreading out for at least a year.*” The well used to dispose of wastewater from oil and gas drilling almost certainly caused a series of 11 minor quakes in the Youngstown area since last spring, Armbruster said. (<http://www.vindy.com/news/2012/jan/03/count-on-more-valley-quakes-seismologist/>)
- A Sept. 2011 **StateImpact** article and accompanying map shows the locations of deep-injection wells in Pennsylvania. The nearest one to our area is in Beaver County. In what I believe to be a related article, **MSNBC.com** reports that the **Nuclear Regulatory Commission (NRC)** published in August 2010 **new estimates of the earthquake risk at nuclear power reactors** in the eastern and central states. Besides the proximity, severity and frequency of earthquakes, the new estimates take into account the design standards used at each plant, along with the type of rock or soil it’s built on. In the updated list of nuclear power sites with the highest risk of an earthquake causing core damage, the **Beaver Valley 1 nuclear reactor in Shippingport PA, Beaver County** comes in at **#5**; the increase in risk is **269% over its old estimate**. In a PDF file link in the article, the NRC states that “*our estimates of seismic hazard at some Central and Eastern United States locations have changed based on results from recent research, indicating that earthquakes occurred more often in some locations than previously estimated.*” It also states that “*the NRC has determined that assessment of updated seismic hazards and plant performance should continue.*” Data from the Youngstown quake investigation could cause the NRC to increase the risk factor at the Beaver Valley reactor even further. (<http://stateimpact.npr.org/pennsylvania/2011/09/22/burning-question-where-are-pas-deep-injection-wells/>) ([http://www.msnbc.msn.com/id/42103936/ns/world\\_news-asia\\_pacific/t/what-are-odds-us-nuke-plants-ranked-quake-risk/#.UPuVjKAS8pZ](http://www.msnbc.msn.com/id/42103936/ns/world_news-asia_pacific/t/what-are-odds-us-nuke-plants-ranked-quake-risk/#.UPuVjKAS8pZ))
- It is well-known that seismic activity can create cracks in cement foundations. It is also well-known that **cement well casings** are the primary defense against groundwater contamination caused by natural gas drilling. As has been noted in aforementioned PA DEP reports, cement well casings have been shown to be problematic, even with new guidelines regulating their construction in place and **even in the absence of seismic activity**.

# Long-Term Environmental Effects

**“H**ydraulic fracturing as it’s practiced today will contaminate our aquifers. If you were looking for a way to poison the drinking water supply, here in the Northeast you couldn’t find a more chillingly effective and thorough method of doing so than with hydraulic fracturing. Occasionally sooner, often later, well seals can and do fail, period.” – Paul Hetzler, former environmental engineering technician, New York State Dept. of Environmental Conservation

- Most of what has been written about the long-term environmental effects of hydraulic fracturing has focused on what Canadian geologist Marc Durand calls “the well’s post-exploitation life” – i.e., what happens with the well after the drilling company has sealed it and walked away, having extracted from it as much natural gas as was economically feasible to extract. *“In a conventional natural gas deposit, that is, one in which the methane has accumulated in natural cavities, it is possible to extract 95% of the gas,”* says Prof. Durand. *“This is certainly not the case when one attempts to extract the shale gas which is still dispersed and imprisoned in extremely impermeable rock. More than three quarters of the methane (80% according to the [Canadian] National Energy Board) remains underground at the end of the exploitation. It will continue to migrate toward the network of fractures and re-pressurize the wells, after they are closed and abandoned.”* (from *“THE EXPERIMENT,”* Marc Durand) (<https://www.facebook.com/notes/shale-gas-info/shale-gas-my-point-of-view-on-wells-the-experiment-the-longevity-of-structures/211286908907240>)
- According to Paul Hetzler (quoted above), subterranean pathways of migration for methane and chemicals used in fracturing may exist even outside the structure of a well: *“No confining layer is completely competent; all geologic strata leak to some extent. The fact that a less-transmissive layer lies between the drill zone and a [water]well does not*

**“The lifespan of a well will be between 10 and 30 years. So in 10 years, we will have the first wells that collapse. What will we do then?”**

*protect the well from contamination. A drinking water well is never in ‘solid’ rock. If it were, it would be a dry hole in the ground. As water moves through joints, fissures and bedding planes into a well, so do contaminants. In fractured media such as shale, water follows preferential pathways, moving fast and far, miles per week in some cases. In the absence of oxygen (such as under the ground), organic compounds break down infinitesimally slowly. Chemicals injected into the aquifer will persist for many lifetimes.”* (<http://www.watertowndailytimes.com/article/20111213/OPINION02/712139975>)

- The problem with the abandoned gas wells will be their deterioration over the years; cracks can develop where the well passes through groundwater aquifers, and the methane still migrating up the well can then pass into and contaminate said aquifer. In an interview published in the **Montreal Gazette**, Prof. Marc Durand elucidates this problem. *“Each of the wells will still be there for a thousand years as the concrete degrades or the steel corrodes,”* Durand says, adding, *“I would say the lifespan of a well will be between 10 and 30 years. So in 10 years, we will have the first wells that collapse. What will we do then?”* (<http://wellwatch.wordpress.com/2011/03/07/montreal-gazette-fracking-will-cause-irreversible-harm/>)

## “Sustainable” Shale

On Mar. 20, 2013 it was announced that a coalition of gas industry representatives and environmentalists, the Center for Sustainable Shale Development, had been formed in Pittsburgh PA. This group proposes “*tough new standards... that could lead to a major expansion of drilling*” in the Northeast.

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- Some things to consider regarding this coalition: 1.) Only a small number of drillers operating in the Northeast have signed on to these “tough new standards.” 2.) The standards being touted are **not mandatory**. 3.) There are still a number of serious issues related to fracking that are not being addressed by these “tough new standards.” 4.) The term “sustainable shale” is an oxymoron. Shale gas, like all natural gas, is non-renewable; hence its use, along with its extraction methods, are the direct antithesis of what is meant by “sustainable.” 5.) While large national and regional environmental groups with corporate backing have joined this coalition, a number of member-based environmental groups like The Sierra Club and smaller grassroots organizations in direct contact with people and communities being affected by the negative impacts of shale-gas drilling have denounced this coalition as a sham.

- From an **Associated Press** article covering the Sierra Club’s comments on the coalition: “*We know that our continued reliance on dirty, dangerous fossil fuels, like natural gas, will not solve the climate crisis, even with the best controls in place,*” said Deb Nardone, a Sierra Club campaign director, who called the new plan “*akin to slapping a Band-Aid on a gaping wound.*” (<http://finance.yahoo.com/news/sierra-club-blasts-plan-improve-fracking-003231140--finance.html>)

- In his essay “Sustainable Shale Development: Hype, Hope or Hoax?” journalist Tom Wilber examines and critiques the “performance standards” proposed by the sustainable shale coalition. Of note is what he discovered about full disclosure of fracking compounds: “*Searching for a point of clarity, I turned to an issue that, in my mind, would be a decisive test of how sincere this whole effort was, and whether my feeling of creeping skepticism was justified. Would the CSSD’s ‘rigorous performance standards’ require operators to fully disclose fracking compounds? The answer, I*

*found in Performance Standard No. 7, is yes. ‘Operators will publically disclose the chemical constituents intentionally used in well stimulation fluids.’ Followed by a no. ‘If an operator, service company or vendor claims that the identity of a chemical ingredient is entitled to trade secret protection, the operator will include in its disclosures a notation that trade secret protection has been asserted and will instead disclose the relevant chemical family name.’ Note: **The difference between knowing a specific compound rather than a general family can be huge in assessing exposure impacts to health and ecology. And the company can invoke the ‘trade secret’ clause for just about anything.***” (<http://tomwilber.blogspot.com/2013/04/sustainable-shale-development-hype-hope.html>)

- An article published by **EcoWatch** contains statements from a number of environmental groups denouncing the Center for Sustainable Shale Development:

*“The cynical intentions of the drillers are stated clearly in the announcement. They say they want to ‘hasten the expansion of fracking.’ They say they want to ‘bypass the often turbulent legislative process altogether.’ They say they want to make ‘drilling more acceptable to states and communities that fear the environmental consequences.’ Making drilling more acceptable and making drilling safer is not the same thing. These statements reveal the industry’s self-serving attitude known all too well to those whose lives have been impacted by drilling,”* said Karen Feridun, founder of **Berks Gas Truth**.

*“The voluntary standards are listed on the oxymoronically-named website [sustainable shale.org](http://sustainable shale.org). The so-called “tough new standards” don’t appear to be substantially different from the corresponding regulations the industry has been blatantly disregarding for years. In addition, they fail to address many issues including radioactivity, methane migration, drill cuttings, community disruption, forest fragmentation, LNG, and compressor stations, to name but a few.*

*“The overwhelming harm of gas development on communities being drilled and our natural environment demands real action, not limp attempts at ‘management’ that just rearrange the deck chairs on a sinking ship,” said Tracy Carluccio, deputy director, Delaware Riverkeeper Network. “First, we need a nationwide moratorium on drilling, then we need to let science and health professionals fully examine and expose the truth about the inherently polluting fracking process, while we work as a nation to replace these deadly resource extraction industries with energy efficiency and clean, truly sustainable energy sources,”*

*“The only way for the fracking industry to self-regulate itself in a fashion that protects the people of Pennsylvania is to **kindly end its operations in Pennsylvania and exit our state,**” said Sam Bernhardt, Pennsylvania organizer at **Food & Water Watch**. “Pennsylvania needs a ban on fracking, and it needs it now.”*

*“Experience has shown that large, industry-oriented environmental groups do not necessarily represent the interests of grassroots, community-based organizations,” said Melissa Troutman, outreach coordinator of **Mountain Watershed Association**. “If you read the book **Managing Activism: PR Advice for Neutralizing Democracy**, author Denise Deegan advises that this sort of ‘dialogue’ is industry’s most effective method for managing activists. In our experience, this is true.”*

*“The anti-fracking movement extends far beyond the environmental community to include religious groups, sportsmen’s associations, health organizations, social justice organizations, renewable energy organizations, political groups, farming associations, and others. The groups the industry worked with on this project are not generally considered to be among the hundreds of groups in the movement in Pennsylvania, as they have maintained an industry-friendly stance on drilling.*

*“This brilliant propaganda on the part of the gas industry and national groups that are not so much environmental organizations as they are greenwashing collaborators only serves to underscore the collective fear they have of how organized, how effective, how nimble, and how truly threatening the grassroots coalition against fracking has become to the interests of the corporate profit agenda of the fossil fuel barons,” said Julie Edgar, organizer of **Lehigh Valley Gas***

**Truth.** *“We stand united—we will not be co-opted—we will not be mollified by what amounts to no more than a crock of radioactive fracking sludge.”*

*“Pennsylvania anti-fracking groups are not the only ones speaking out against these voluntary fracking standards. Josh Fox on behalf of **Americans Against Fracking**, said: “The Center for Sustainable Shale Development, a new greenwashing group backed by the oil and gas industry, will not mitigate the economic, environmental and public health threats posed by hydraulic fracturing (fracking). That is because **no amount of regulations can ever make fracking safe. It is an inherently dangerous practice.***

*“**Americans Against Fracking**, a coalition representing **over 190 organizations** dedicated to protecting Americans from the devastating effects of fracking, urges the public and policy makers to see this endeavor for what it is: **a thinly veiled attempt to mask the irreparable damage posed by a practice that has been linked to air and water contamination, cardiovascular disease and the industrialization of rural communities.***

*“This center does not represent the interests of the environmental community, and very few members of the movement to protect communities and their vital resources from fracking were consulted in the development of the center’s so-called ‘standards.’ In fact, there is a growing movement that recognizes that fracking must be banned. **Partnerships such as this only set the stage to escalate fracking activity, while reinforcing our addiction to fossil fuels.***

*“This initiative is brought to us by the same industry that negotiated exemptions from key environmental protections such as the Clean Air Act, the Clean Water Act and the Safe Drinking Water Act. We can’t trust them to take the physical or economic safety of Americans to heart.”*

[\(http://ecowatch.com/2013/new-fracking-standards/\)](http://ecowatch.com/2013/new-fracking-standards/)

## Videos

“*We know there are significant risks associated with ... the pollutants involved in fracking,*” says Anthony Ingraffea, a rock-fracture mechanics expert at Cornell University. “*These drilling techniques result in amounts of toxic matter so large – in solid, gas, and liquid states – that, in effect, everybody is ‘downstream.’ You can’t get far enough away.*”

<http://www.rollingstone.com/politics/news/the-fight-over-fracking-josh-fox-vs-big-gas-20110517#ixzz2NdZnL4pc>

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This report was initially intended to be solely a *printed* report; thus I did not include any video links in the initial report. However, in this online version, it seems appropriate to include a few links to videos that I have found illuminating with regard to the hazards of unconventional shale-gas drilling.

- ***Fracking Hell*** is an 18-min. British documentary, filmed in northeastern Pennsylvania, that highlights many of the problems associated with shale-gas drilling. ([http://www.youtube.com/watch?v=dEB\\_Wwe-uBM](http://www.youtube.com/watch?v=dEB_Wwe-uBM))
- Dr. Tony Ingraffea, a rock-fracture mechanics expert at Cornell University, has created several videos highlighting the problems with shale-gas drilling. Below is a representative sample. (<http://www.youtube.com/watch?v=mSWmXpEkEPg>) *The Facts on Fracking*, a one-hour, 45-min. presentation on fracking mechanics and the problems associated with this process.
- (<http://www.vvhostfarms.org/researchers-discuss-fracking---youtube-video-presentations.html>) This is a 3 part video presentation by Tony Ingraffea, Ph.D. In his presentation, Dr. Ingraffea decimates four myths central to the shale gas industry: (1) Fracing is a 60-year old, well-proven technology; (2) Fluid Migration from faulty wells is a rare phenomenon; (3) The use of multi-well pads and cluster drilling reduces surface impacts; and (4) Natural Gas is a clean fossil fuel.
- (<http://shaleshockmedia.org/2013/01/22/dundee-debate-engelder-vs-ingraffea/>) To hear “both sides of the story,” this is a video of the debate between pro-fracking advocate Dr. Terry Engelder of Penn State University and Dr. Ingraffea that took place on Jan. 23, 2013 at Dundee Central High School in Dundee, NY in New York’s Finger Lakes region. The debate is filmed in separate video segments, one following the other.
- The film *Triple Divide* reveals how water contamination is being covered up by the industry and the state of Pennsylvania, and that state regulators are using “compliance” as a means of regulating without enforcing the law, abandoning the public in the wake of shale gas development. Its title represents the “triple divide” of headwaters in northcentral Pennsylvania: one of only four Triple Continental Divides in North America, a place that provides drinking water to millions of Americans, signaling to the audience that everything, and everyone, is downstream from shale gas extraction. Visit website to rent, buy or download. (<http://tripledividefilm.org/>)
- I have purposefully shied away from mentioning the movie *Gasland* in this report because it has become such an easy target of ridicule for pro-industry forces. I guess perhaps I wanted to show that one could compile a substantial report on why certain communities have felt compelled to ban or significantly restrict shale-gas drilling without referencing this groundbreaking film that the gas industry loves to hate. I think I have accomplished that. However, the fracktivist community (and by “fracktivist” I mean people who are concerned about shale gas extraction and attempting to *do* something about it) owes director Josh Fox a great debt of gratitude for “getting the ball rolling” on shale-gas concerns. And so I would be remiss not to mention his film here at the end of this chapter on “why” these communities have enacted fracking bans... One can watch, rent or buy *Gasland* via NetFlix, or look for it in the video rental section of your local public library. **Note:** It is about *much more* than flaming faucets... (<http://www.gaslandthemovie.com/>)



## Part III: Further Considerations

# *Sociological Impacts*

*“Harvesting this gas promises either to provide Americans with a clean domestic energy source or to despoil rural areas and poison our air and drinking water, depending on whom you ask.”*

– Eliza Griswold, *“The Fracturing of Pennsylvania.”*

**The fractures tend to manifest along the lines of those deriving economic benefit from drilling and those being negatively impacted by it.**

- There is nothing that the Butler Township commissioners can do to forestall the sociological “fracturing” that inevitably accompanies hydraulic fracturing development. Indeed, it has already begun, as was evidenced at the Dec. 7, 2011 township zoning board hearing for the first shale wells to be drilled in the township. A man who trains horses on his property near the wells asked for time to construct noise barriers on his property to protect his horses from excessive truck noise. In his testimony at the hearing he noted that his neighbors “are mad at me” because he wanted to delay the start of the drilling – not to **stop** it, but merely to **delay** it. This follows the typical development of the sociological “fracturing” in the shale gas lands: the fractures tend to manifest along the lines of those deriving economic benefit from drilling and those being negatively impacted by it. I include this phenomenon in this report merely to heighten the commissioners’ awareness of it, and to help them realize that, inevitably, by their actions or non-actions, they will incur the praise and the wrath of those on one side or the other of that sociological divide.
- As mentioned in the “Toxic Chemicals” section of this report, the academic study *Playing for Keeps Along the Susquehanna* by Dr. Simona L. Perry details both the environmental and sociological impacts of hydraulic fracturing on communities in Bradford County PA. ([http://catskillcitizens.org/learnmore/PerryPostDoc\\_FINALREPORT\\_July2011.pdf](http://catskillcitizens.org/learnmore/PerryPostDoc_FINALREPORT_July2011.pdf)) Likewise the book *The End of Country* by Seamus McGraw explores both the positive and negative sociological impacts of this development on rural northeastern Pennsylvania. (<http://www.seamusmcgraw.com/>) For a concise, unblinking look at both sides of the “fracture,” read the *New York Times* article “*The Fracturing of Pennsylvania*” by Eliza Griswold, which focuses on Amwell Township, Washington County PA. (<http://www.nytimes.com/2011/11/20/magazine/fracking-amwell-township.html?pagewanted=all&r=0>)

# Human Rights

*“Human rights are minimal standards. They are concerned with avoiding the terrible rather than with achieving the best. Their focus is protecting minimally good lives for all people.”* – James Nickel, “Human Rights” in the *Stanford Encyclopedia of Philosophy*, 2006.

- As mentioned in the “General Statements” section of this report, a recent **United Nations General Assembly** document (*Document A/HRC/18/NGO/91*, distributed Sept. 19, 2011) informs the U.N. **Human Rights Council** that the environmental damage caused by hydraulic fracturing for natural gas poses “*a new threat to human rights.*”  
The document *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas*, released on Dec. 12, 2011, was prepared for the **New York State Department of Conservation** by the organization **Environment and Human Rights Advisory (EHRA)**. Although this document was prepared for the state of New York, the human rights “norms” contained therein are internationally recognized, and the exploration of how these norms are potentially encroached upon and violated by hydraulic fracturing relate to situations that are part of the general human experience and are not limited to New York State.
- The EHRA document explores 26 internationally recognized “norms of concerns” which are obviously or potentially being violated by the process of hydraulic fracturing for natural gas and the environmental damage and health risks which accompany it. As the document states, “*Human rights standards apply to individuals, not just to majorities. This means that if even one or two persons’ rights are violated, then human rights violations have occurred. Some of the following rights are grounded in legal authority – ADA [Americans with Disabilities Act] rights, protections against chemical trespass, etc. But all of these rights, including those without grounding in domestic law, are recognized as grounded in moral authority. Human rights standards are recognized as trumping other types of policy justifications such as utility, cost-benefit analysis, economic value, social policy, etc. As civil laws represent hard legal boundaries outside of which certain behaviors are not legally permissible, human rights standards represent hard ethical boundaries outside of which certain behaviors are not morally permissible.*”
- From the section of the EHRA document entitled “*Potential liabilities*” (pgs. 4-5): “*Potential economic risks include liability insurance carriers reconsidering their coverage, conditions and premiums for losses related to fracking operations. Other economic risks include potentially costly legal actions... for failure to adequately regulate fracking practices as a violation of human rights, possible legal action with respect to the Americans with Disabilities Act, and possible multiple small claims court actions.*”
- In the section of this report, “Drilling in Proximity to Vulnerable Populations,” I discussed human rights norms related to children’s health and education that were being potentially encroached upon by hydraulic fracturing processes. In this section I will focus on rights that are related to the enjoyment of one’s home and property and also on the right to work.
- Human rights norm of concern #2 in the EHRA document is the “*Right to privacy and home.*” “*This is the right to be secure in one’s home, to be able to enjoy the use of one’s property and to not have one’s property devalued as a result of a state’s failure to adequately regulate. ‘The European Human Rights Court noted that severe environmental pollution may affect individuals’ well-being and prevent them from enjoying their homes in such a way as to affect their private and family life adversely, without, however, seriously endangering their health.’ This means that adverse health effects are not the only kind of adverse effects that violate the right to one’s property and home. Reasons for concern: 1.) Discomfort experienced at home, or a compromised ability to enjoy one’s home and property due to air and water contaminants, as well as noise and light pollution, associated with hydraulic fracturing operations, even without adverse health effects. 2.) Potential adverse physical health effects from exposures to air*

and water contaminants associated with hydraulic fracturing operations and suffered in the home.” ([http://www.earthworksaction.org/files/publications/EHRA\\_Human-rights-fracking-FINAL.pdf](http://www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf))

Note: Please remember that these are internationally recognized human rights norms, and quotes from non-domestic sources (e.g., the European Human Rights Court) do not denote non-applicability in the United States or in Pennsylvania.

- The human rights norm mentioned above is discussed in **legal terms** in the article *Homeowners and Gas Drilling Leases: Boon or Bust?* published in the **New York State Bar Association Journal**: “American culture traditionally favors land use that keeps heavy industrial activity out of residential neighborhoods. The reasons range from safety to aesthetics. A home represents a family’s most valuable asset, financially and otherwise. In legal terms, home ownership or “fee simple absolute title” means a bundle of rights encompassing the air space above and the ground below the land surface. It entitles homeowners to build up and out, pledge the house and land as collateral for a mortgage loan, and lease or sell the property. Part of a home’s purchase price pays for this bundle of rights. Another bundle of rights attributable to home ownership consists of the actual roof over one’s head; clean, running water; and access to utilities. A third bundle of rights is attributable to the intangibles that make a house a home, such as peaceful sanctuary, fresh air, and a safe, secure haven for budding children. Residential fracking challenges all of these attributes of home ownership.” (<http://www.nysba.org/AM/Template.cfm?Section=Home&ContentID=57132&Template=/CM/ContentDisplay.cfm>)
- Despite the tongue-in-cheek title, Andrew Reinbach’s article “*Stop Gas Drilling – Sue Your Neighbor*” in **Huffington Post Green** covers much of the same ground as the statement directly above. “When you bought your house you didn’t buy just dirt and bricks; you bought what your lawyer calls a bundle of rights. That includes what he or she calls the right of quiet enjoyment.” He goes on to discuss two separate Pennsylvania lawsuits against drilling companies. “Two recent Pennsylvania lawsuits filed separately against Southwest Energy Co. and Chesapeake Energy Corp., claim

**Human rights standards apply to individuals, not just to majorities. This means that if even one or two persons’ rights are violated, then human rights violations have occurred.**

that their gas drilling has contaminated local water supplies and harmed the related property values. That first claim -- that gas drilling contaminated the local water -- is the hot button issue for anti-drilling activists. But Peter Cambs, the partner in Parker Waichman Alonso LLP fighting the suits, likes the property value issue better. ‘It’s the stronger claim,’ he says. ‘I don’t think there is a defense’ against it. Nationwide, the statistical case that gas drilling depresses property values is practically bullet-proof.” ([http://www.huffingtonpost.com/andrew-reinbach/stop-gas-drilling-sue-you\\_b\\_787881.html](http://www.huffingtonpost.com/andrew-reinbach/stop-gas-drilling-sue-you_b_787881.html))

- EHRA human-rights norm-of-concern #5 revolves around the right to work and the ways in which hydraulic fracturing might encroach upon that right. The document lists four reasons for concern: “1.) Citizens who become unable to work because of disabilities resulting from exposures associated with hydraulic fracturing practices. 2.) Citizens who are unable to work because their place of work is located in or near hydraulic fracturing operations. 3.) Citizens who may be unable to transport themselves to work due to their need to avoid exposure to contaminants associated with hydraulic fracturing practices. 4.) Workplaces that have been contaminated by hydraulic fracturing practices enough that some workers are unable to perform their work or keep their jobs would be an encroachment on this right.” Human-rights norm-of-concern #1, the right to life, liberty and security of person, lists a reason for concern that ties into the right to work: “If any citizens consider that injury or threat of injury from exposure to contaminants resulting from fracking practices will require them to move out of the area, particularly if that would result in documentable economic loss, that would be an encroachment on this right.” ([http://www.earthworksaction.org/files/publications/EHRA\\_Human-rights-fracking-FINAL.pdf](http://www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf))

## Economic Considerations

**Q**uestion: What are the potential downsides of a drilling ban for Pittsburgh?  
Doug Shields: “*I can’t think of one. Not a single one at all.*”

**“You may have a lot of tax money coming in, but you also have to provide additional people with services -- public health, public safety, roads, schools -- and when the bust comes, you lose that population, but you still may have [to pay for] the infrastructure that you built up,”**

- Despite Councilman Shields’ optimistic outlook re: the potential downsides of a drilling ban for Pittsburgh, the Butler Township commissioners might not share that perspective. For one thing, as Bradford County commissioner Mark W. Smith mentioned in his April 2011 letter to Gov. Corbett, “The economic benefit of this development is unquestionable.” Even with reports of shale drilling jobs creation claims having been exaggerated, citing data from the PA Dept. of Labor and Industry and the U.S. Bureau of Labor Statistics (see reports “*Marcellus Shale Boom Adds Almost 10,000 Jobs in 3 Years*” from the Keystone Research Center, and “*Fracking Nonsense: The Job Myth of Gas Drilling*” from the Center for Economic and Policy Research), still, communities that have hosted shale gas drilling have derived economic benefit from it that no doubt would have been absent otherwise. Communities that have banned drilling have had to weigh these economic opportunities against the environmental, safety and public health risks that also accompany this development. (<http://keystoneresearch.org/media-center/media-coverage/report-marcellus-shale-boom-adds-almost-10000-jobs-3-years>) (<http://www.cepr.net/index.php/blogs/cepr-blog/fracking-nonsense-the-job-myth-of-gas-drilling>)
- Much has been written of the “boom-bust cycle” of shale gas extraction: short-term economic benefit followed by hidden long-term costs re: environmental damage and human health impacts. A report in the **Cornell University Chronicle** discusses the work of Susan Christopherson, a Cornell professor of city and regional planning who is leading a team of researchers in analyzing the economic consequences of natural gas extraction in the Marcellus Shale. Typically, resource extraction industries go through boom-bust cycles and produce costs to communities that remain after the boom is over, says Christopherson. During the boom, “*you may have a lot of tax money coming in, but you also have to provide additional people with services -- public health, public safety, roads, schools -- and when the bust comes, you lose that population, but you still may have [to pay for] the infrastructure that you built up,*” Christopherson says. “*Once you extract all the gas from a particular county, it’s done; all the drilling rigs leave, and it appears that communities may be worse off than when they started.*” Christopherson’s report likewise states that recent figures on actual employment in Pennsylvania have been much lower than the industry estimates. “*We are trying to develop a model with more accurate and transparent assumptions, and also educate the public about how to evaluate any model used to project jobs numbers.*” She also says that a natural resource extraction operation moving into a region “*may crowd out other industries by raising labor costs or creating conditions adverse to industries such as tourism or*

*dairy farming.*” Christopherson’s research is supported by the **Park Foundation** and the **Heinz Endowments**, who “*wanted the broader economic consequences to be part of the conversation, and to inform policymakers and the public about what they could expect,*” she says. (<http://www.news.cornell.edu/stories/Sept11/ChristophersonNYgas.html>)

- In an op-ed piece from May 2011 re: **state impact fee legislation**, (<http://www.senatorsarnati.com/press-2011/0511/052611.htm>) PA Sen. Joe Scarnati stated that “*communities that choose to ban drilling will not collect money from the impact fees.*” This statement at once shows that state government acknowledges communities who have enacted drilling bans and also penalizes them for having done so by making them ineligible for impact fees. In a private conversation with Pittsburgh City Councilman Doug Shields at the Butler County Democratic Committee fall dinner at Conley Resort, I asked Mr. Shields about this subject. He feels that the ineligibility stipulation is unfair, since communities that have banned drilling still suffer impacts from drilling operations in adjacent communities, such as increased truck traffic and air and water pollution. The latter was the reason for the introduction and eventual passage of Pittsburgh’s “**toxic trespass**” **legislation**. (See “Who and How?” section under “ballot referendum”) At the same time, Mr. Shields stated that the formulas dictating the amount of impact-fee moneys a community receives have nothing to do with the actual costs of drilling impacts. For one thing, a comprehensive environmental impact study was never performed in the state of Pennsylvania, and even states like New York which have conducted such studies have not figured the impacts on **human health** into the equation (see letter from **250 healthcare professionals** to NY Gov.

**A comprehensive environmental impact study was never performed in the state of Pennsylvania, and even states like New York which have conducted such studies have not figured the impacts on human health into the equation**

Andrew Cuomo, “Health Impacts” section). Nonetheless, Butler Township will be ineligible for state impact fee money if it bans natural gas drilling. This is another factor to be taken into consideration.

- In the section “*Measures to Reduce Liabilities*” of the document *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas* (pg. 29), EHRA outlines measures that the New York State Department of Environmental Conservation should require before any plans to license hydraulic fracturing operations are agreed to. Included among those measures are: 1.) “*a comprehensive study of human health impacts related to fracking operations,*” and 2.) “*full cost accounting, including costs for externalities*

*such as impacts on local infrastructure, roads, social services, human and environmental health, etc., the results of which should be made public and easily accessible.*” ([http://www.earthworksaction.org/files/publications/EHRA\\_Human-rights-fracking-FINAL.pdf](http://www.earthworksaction.org/files/publications/EHRA_Human-rights-fracking-FINAL.pdf))

Neither of these measures have been undertaken by the PA DEP or the PA General Assembly in determining formulas for impact fee assessment.

## Legal Concerns

The threat of lawsuits is a concern to any municipality seeking to ban or significantly restrict natural gas drilling. According to a **Pittsburgh Post-Gazette** “*Pipeline*” report, South Fayette Township (Washington County) commissioners have approved a \$12.1 million budget for 2012 that “*earmarks \$20,000 for defending the township’s Marcellus Shale regulations against a legal challenge by natural gas driller Range Resources.*”

<http://pipeline.post-gazette.com/index.php/news/politics/24217-south-fayette-earmarks-20g-for-shale-defense>

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**“The US Department of Justice maintains a website with detailed information about ADA requirements. In general, this law requires that everyone who has, or is perceived to have, a disability not be discriminated against in any way.”**

- To date, no municipality that has adopted a **CELDF** community-rights ordinance to ban drilling has been sued by the gas industry. Of course, that could change tomorrow, or may have changed after this report was completed. The outcome of such a court action is far from certain. When asked why the industry had not yet sued a municipality with a drilling ban, Pittsburgh City Councilman Doug Shields cited “*a number of practical constitutional and political questions that would certainly arise in such suits*” as a possible reason. Initially Pittsburgh’s drilling ban was decried by the industry and certain critics in the General Assembly as “illegal” (see **Pittsburgh Post-Gazette** article on ban in “Who and How?” section), but Councilman Shields refers to Sen. Joe Scarnati’s statement about communities that ban drilling being ineligible for impact-fee money (see “Economic Considerations”) as “*a de facto acknowledgement and some level of acceptance of local ban ordinances by leading Republican leadership.*”
- Many times it has been mentioned among advisory board members how much money Butler Township spent in legal fees fighting cell tower construction years ago, and how much money Penn Township has spent recently trying to regulate the natural gas industry beyond what the state’s **Oil and Gas Act** will allow. There are at least two differences apparent from those two situations if the township would choose to ban natural gas drilling via a **CELDF** community-rights ordinance. One is that **CELDF** will write a community-rights ordinance to ban drilling in the township absolutely free of charge, aside from travel expenses and meals if they need to travel to Butler Township. The other is that, if the township were to be sued due to this drilling ban, **CELDF** will write the legal defense of their ordinance for free. The township would still need to hire a lawyer to try said defense; **CELDF** is busy with actions in several states and hasn’t the manpower to try all cases. There is the case where lawyers from **Healey and Hornack, P.C.** in Pittsburgh represented **Peters Township Marcellus Shale Awareness** in court pro bono on behalf of **CELDF** (see

under “ballot referendums” in the “Who and How?” section); whether they would do so for a municipality is something that the township could investigate. Also, non-profit public interest law firms like **Earthjustice** might be interested in trying a CELDF defense. The point being that the legal defense of a CELDF ban on drilling would be available to the township at reduced cost compared to the cell tower fight or Penn Township’s recent regulatory struggles with the gas industry.

- As mentioned in the “Human Rights” section, the document *A Human Rights Assessment of Hydraulic Fracturing for Natural Gas* details “potential liabilities” for the New York State government if it allows hydraulic fracturing operations to go forward, including “potentially costly legal actions brought against the New York State DEC for failure to adequately regulate fracking practices as a violation of human rights, possible legal action with respect to the Americans with Disabilities Act, and possible multiple small claims court actions.” Human rights norm-of-concern #23 in the document discusses the **Americans with Disabilities Act (ADA)**, the ways in which hydraulic fracturing operations can effect the disabled and the people who would be most severely affected by these operations. “*The US Department*

**Individuals with asthma or other respiratory conditions, chemically sensitive persons, pesticide sensitive persons, people with certain allergies, immunocompromised people, the elderly, the very young, pregnant women, any place-bound persons (in hospitals or elder care facilities, for example), to name a few vulnerable sub-sets of residents, may be reasonably expected to experience more serious adverse effects from exposure to fracking operations than the general population.**

*of Justice maintains a website with detailed information about ADA requirements. In general, this law requires that everyone who has, or is perceived to have, a disability not be discriminated against in any way.*

*Discrimination occurs when any sub-group is disproportionately impacted by a policy or practice and no sufficient accommodations are made for them. Individuals with asthma or other respiratory conditions, chemically sensitive persons, pesticide sensitive persons, people with certain allergies, immunocompromised people, the elderly, the very young, pregnant women, any place-bound persons (in hospitals or elder care facilities, for example), to name a few vulnerable sub-sets of residents, may be reasonably expected to experience more serious adverse effects from exposure to fracking operations than the general population. Have reasonable accommodations been*

*developed for persons in those groups to insure that they can avoid being unfairly impacted by fracking practices?” It is entirely possible that Butler Township could be included in a lawsuit against the state of Pennsylvania for failure to adequately protect any of the aforementioned “sub-groups” from the toxic hazards of hydraulic fracturing described elsewhere in this report.*

# Part IV: Final Statements and Recommendations

**I recommend that this report be made public, so that township residents can have a greater awareness of the hazards and issues associated with hydraulic fracturing**

On July 18, 2011, a most remarkable conversation took place in the Butler Township Municipal Building, at the regularly scheduled meeting of the Board of Commissioners. It began with one of the commissioners commenting that he would like to contact the **Community Environmental Legal Defense Fund (CELDF)** to learn more about community-rights ordinances that would ban drilling in Butler Township. The participants in the ensuing conversation were two of the four commissioners in attendance that night, the township zoning officer and the township solicitor. They discussed the ordinances already in place which regulate drilling in the township (i.e., relegating it to manufacturing and agricultural zones), and whether those ordinances were sufficient, or would they need to be strengthened or perhaps even relaxed. But always the conversation returned to the option of banning drilling altogether. Amazingly, not once was that option summarily dismissed. Equally amazing was that, among the conversation's participants, there was an understanding that a community-rights ordinance was not your typical zoning regulation; it was, as one participant put it, "a different animal altogether..." Out of this conversation the idea for the Butler Township Marcellus Shale Advisory Board was born, and because of the concerns of the participants in that conversation, the topic of drilling bans was included in the advisory board's agenda of inquiry.

As I write this section, the advisory board is waiting for the **Pennsylvania General Assembly** to complete its deliberations on proposed impact fee legislation. Part of that legislation could potentially affect the township's ability to zone for drilling – either preempting all current zoning ordinances in the Commonwealth regarding drilling or subjecting those ordinances to the rulings of the state Attorney General. Such language in the impact fee bills of both the state House and Senate could render null and void any discussion of whether to strengthen or relax current drilling ordinance or whether even to maintain the status quo; even the latter option may be taken out of the township's hands.

But will the proposed legislation affect the validity of the half-dozen community rights-based drilling bans currently on the books in the Commonwealth? Or, to phrase the question in the context of the township's discussions on this topic, will the conditions that were in place on the night of July 18, 2011 be significantly altered by this proposed legislation? The answer would be



that, unless language is introduced into this legislation that specifically targets the legal viability of local drilling bans, then the conditions extant on July 18, 2011 when the township was discussing the ban option would be virtually unchanged. (See **Preface: Act 13.**) As it now stands, the only mention of drilling bans in the proposed legislation is that communities that ban drilling would be ineligible for impact fee money, as was discussed in the previous section.

And so, barring an outright “ban on drilling bans” by the State legislature (and, consequently, barring a failure to overturn such a “ban on bans” in the courts), I have the following recommendations for the Butler Township Board of Commissioners:

1. If the contents of this report have caused the commissioners to have grave doubts about the safety of the hydraulic fracturing process for natural gas extraction, if this report has stirred a deep level of concern for the health and safety of township residents and for the continued financial viability of township properties, if the commissioners are less than confident in the ability of the **PA DEP** to adequately regulate the shale gas industry and to protect township residents from the myriad hazards of said industry as outlined in this report, then I recommend to the township commissioners that they schedule an appointment with a representative of the **Community Environmental Legal Defense Fund (CELDF)**, listen to what that person has to say about community-rights drilling bans, ask questions, get answers, and then proceed with caution as their individual and collective consciences shall dictate.
2. I also recommend that the commissioners’ deliberations on this important issue be **public** – that this issue become an “*agenda item*” at board-of-commissioners meetings until the debate is resolved and an action is decided upon, even if that action is to do nothing. Township residents have a right to know what is and isn’t being done with regard to this issue. They also have a right to know where **each commissioner stands on this issue individually**, and the process by which the board of commissioners arrives at its conclusions.
3. I recommend that this report be made public, so that township residents can have a greater awareness of the hazards and issues associated with hydraulic fracturing for shale gas extraction and so might be compelled to share their thoughts on this matter with the board of commissioners.

## UPDATE: Butler Township and Drilling Bans

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As I write this section in early February 2013, the Butler Township Board of Commissioners has **no interest whatsoever** in a drilling ban for the township and shale-gas drilling has been ongoing in the township for about a year. Not only are the commissioners not interested in considering a ban, but, when I spoke to them about it at the 7-16-12 BTBC meeting, collectively they **could not remember having ever discussed a ban**. In fact one commissioner claimed on record at the next (8-6-12) commissioners' meeting that he had looked at the minutes from the 7-18-11 meeting (referenced in the previous section) and concluded that a "ban was not discussed" at that meeting, tho' the below segment from the minutes of said meeting would seem to indicate otherwise. Regarding said segment, this commissioner recently accused me of "interpreting the minutes the way I want them to read," and so I shall refrain from any further commentary, except to say that I have emphasized in **boldface** those parts of the conversation where a ban was (or **seemed** to be?) mentioned.

*Vice-Pres. Zarnick proposed a Marcellus Shale Advisory Board. He would like input from residents or if there is someone who lives outside the Township but is knowledgeable about the subject.*

*Zoning Officer Davis stated that she thought you would definitely want the Solicitor involved. She reminded the Board that they did do something in 2009, we made an amendment at that time to the zoning ordinance to restrict Marcellus Shale drilling to only industrial and agricultural areas. It is not permitted in residential areas so that is already in place. It is a special exception under both industrial and agricultural areas and would have to go before the Zoning Hearing Board and there are a number of conditions that will have to be met. If you want to do something more or **eliminate it all together** or have more discussions on regulations in the areas where it is permitted the timeline to do that before they start drilling is pretty short so you should move forward.*

*Commis. Simon stated if we don't do something now, it may be too late. He doesn't want to get into a legal battle about regulation, he is talking about what the residents that came here several times have discussed. **Banning it altogether is a horse of a different color. If we want to look into the legalities of that and if we are prepared to take on that type of a challenge.***

*Manager Kirkwood stated we could advertise for any interested participants. He suggested advertising for letters of interest in membership on a Marcellus Shale Advisory Board with the letters being due in by August 3rd. We will be meeting again on August 1st and in the meantime, individually everyone jot down what their concept of what this Committee is and then at the August 1st meeting we can put it all together.*

*Zoning Officer Davis suggested that the task needs to be twofold, **first thing you would want the Committee to determine is if you want to ban it completely in the Township, if so then how do we move forward in doing that.** If that is not something this Committee feels is necessary then they have to determine if what we have in the ordinance is adequate, if not, what recommendations would they make to add to the regulations we have.*

*Vice-Pres. Zarnick stated that he doesn't like that idea. Why can't we have the Committee work on it and make recommendations back to us. To him it sounds like if we do it that way, we are looking for a one-sided answer.*

*Zoning Officer Davis stated **you either want it or you don't.** Manager Kirkwood stated that he didn't agree with Zoning Officer Davis' suggestion either. He thinks that **one of the directives of the committee is to go out there and do some research to find out what the pitfalls are associated with total banning.** If you think that we should limit it to agricultural, industrial or any other area, then you need to research that and bring back those findings. He doesn't think we want to the Committee to make the decision for the Board, we want the Committee to go out and look at different options, do the necessary research and bring the findings back to the Board then the Board can go through them and make their decision.*

*Engineer Deiseroth stated that there is property in the agricultural area that has already been leased, we have been given notification that there is a potential for drilling in areas in conformance with the terms of the current ordinance. The Zoning Officer has sent a letter to them and the property owner to let them know about our current ordinance which allows them to drill but has restrictions that they have to comply with. You don't know how much land already leased.*

*Further discussion was held relative to this issue.*

*Manager Kirkwood was directed to advertise for anyone interested in being a member on the committee.*

# Why I Resigned from the Marcellus Shale Advisory Board

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On March 19, 2012, I resigned from the Butler Township Marcellus Shale Advisory Board.

At that time, the PA General Assembly had recently passed Act 13, with its extremely prohibitive zoning provisions which basically took all zoning rights away from PA municipalities regarding natural gas drilling, thus rendering the purpose of the advisory board null and void.

However, a number of PA municipalities banded together to challenge the legality of that zoning provision in court. This meant that current zoning ordinances were still legal until a judgment was rendered regarding the Act 13 zoning provisions. This legal process, with appeals expected from both sides, could take years. The advisory board was therefore placed “on hiatus” until a judgment on this lawsuit was reached.

Meanwhile, I noticed that the drilling companies were not waiting for the courts to settle this issue, nor for any recommendations from the shale advisory board, before moving into Butler Township and setting up shop with drilling permits and well-pad construction. Being on the advisory board meant that I was prohibited from speaking to the township commissioners about the hazards and issues associated with shale-gas drilling and processing – something which I had done regularly prior to being on the advisory board. In the face of the gas industry’s rapid deployment in the township, I felt urgently compelled to balance the perspectives they were presenting to township officials with “the other side of the story.”

Thus, at the March 19, 2012 meeting of the Butler Township Board of Commissioners (BTBC), I resigned from the Butler Township Marcellus Shale Advisory Board. Immediately after my resignation had been accepted by the board, I presented the commissioners with a copy of this report, which I had compiled during my months as a member of the advisory board. I wanted them to know the scope of issues associated with this development, and that it was *not* “just another industry” setting up shop in the township.

In the months that followed, I continued to speak to the commissioners about the problems associated with shale-gas drilling at every BTBC meeting I was able to attend, until that fateful night in July 2012 (see previous page), when the “collective amnesia” exhibited by the board re: having ever discussed a drilling ban led me to believe that further discussions with them would indeed be futile – regardless of all the warnings that there may be something toxically *wrong* with this industry, the matter had already been decided...

## Future Updates of This Report

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The initial online version of this report (March 2013) is pretty much the same one that I submitted to the Butler Twp. commissioners in March 2012, with a few additions. In the year since that submission there have of course been a number of new articles and studies on problems with shale-gas drilling, regulatory agencies, etc. which I have bookmarked for future use. That information will be added to this report in **future versions** of this report. To make it easier to peruse the information that has been **added** in any future version, an **addendum page** will appear at the beginning of each new version, giving a brief description of the additional information and a link to that article, study etc. within that version of the report. The addendum page will contain **only information that is new to that version**. I will try to denote within the text of the report which articles/studies have been added since the initial March 2013 publication and when. Updated versions of this report will be designated by the **month and year** of the update (i.e., this initial version is **Version 2013.03**) and will appear **no oftener than once a month**, with greater gaps at times, depending on my personal schedule.