

Robert Myers, Ph.D.
Lock Haven University

I've been studying the environmental effects of hydro-fracturing for 3 years, and, it's clear to me that **this industry represents the biggest environmental threat to Pennsylvania of my lifetime.**

Documentation: <http://www.lhup.edu/rmyers3/marcellus.htm>.

To me the **most serious threat** has been the **endless series of spills and accidents** that spew chemicals into our streams and forests.

Allow me to give just a **few examples**.

- On March 15, 2010 a foamy substance was detected running into Pine Creek, a first-rate trout stream, an excellent kayaking route, and the site of a popular Rails-to-Trails biking and hiking path. The Pennsylvania Department of Environmental Protection determined that the substance was Airfoam HD, a chemical used in the drilling process. The operators of the drilling site run by Pennsylvania General Energy explained that they did not anticipate heavy rains--in March--in Pennsylvania.
- On June 3, 2010, a gas well that was being fracked by EOG Resources in Clearfield County experienced a blowout and raged out of control for 16 hours, shooting fracking fluid and gas 75 feet into the air. EOG, whose spokesperson insisted that protecting the environment is of "utmost importance" to the company, waited five hours before contacting the DEP.
- On August 17, 2010, Atlas Resources allowed used fracking fluid to overflow a waste water pit and contaminate a tributary of Dunkle Run, a high quality watershed in Washington County. Atlas failed to report the spill to DEP.
- On November 22, 2010, the DEP announced that it was investigating a large spill of hydraulic fracturing fluid at a site run by XTO Energy. The spill has been estimated to be 4,275 gallons, which contaminated a unnamed tributary of Sugar Run, a spring, and two private wells. A DEP investigator discovered an open valve that was discharging the fluid from an unattended tank.
- On April 19, 2011, seven families were evacuated from their homes after a Bradford County well that was being fracked by Chesapeake Energy blew out and spilled thousands of gallons of flowback fluid into a tributary of Towanda Creek, which runs into the Susquehanna River. The DEP confirmed that amphibians in a farm pond died as a result of the spill, which took 12 hours to contain.
- On July 29th, August 2nd, and August 10th, Laser Northeast Gathering Co. spilled 1500 gallons of drilling mud into Laurel Lake Creek, an exceptional quality stream in Susquehanna County.

These incidents have become **commonplace in Pennsylvania**.

Last year the **DEP made their records of Marcellus violations available** to the general public. These reports make interesting reading as they reveal the gas industry's attitude toward environmental regulation.

A fairly **typical company** is **Chief Oil & Gas**, whose website promises that they are "proud of our environmental record as well as the way in which we have efficiently and responsibly protected water and natural resources."

In **2010 Chief received 174 violations**. Many of the violations are minor (failure to post permit numbers). However, some of the violations are much more troubling.

- On January 5th Chief was cited for allowing frac fluid, antifreeze, hydraulic oil, and diesel fuel to spill onto the ground at a site in Lycoming Country. They were also cited for not reporting this incident.
- On May 3rd, the DEP cited one of Chief's Bradford County sites for ongoing flowback leaks, for spilling drilling cuttings on the ground, and for 7 petroleum releases. These incidents were not reported to the DEP.
- On May 27th, the DEP agent at a Bradford County site noticed a flowback spill and a large swath of dead vegetation that extended from the well site. The spill may have entered a nearby stream. There were also spills of diesel fuel, cuttings, brine, and an unknown gel. Chief was cited for not notifying DEP.
- On June 10th the DEP noticed an offsite discharge at a Somerset County site. Water samples were taken and the results indicated that the discharge contained greater than 1000 milligrams/liter of hexane extractable material. Hexane is a hydrocarbon that is used as a solvent. Long-term exposure causes a failure of the peripheral nervous system. The operator admitted that three days earlier they had spilled 30 gallons of oil-based mud, and, once again, they did not contact DEP.

I could continue and list more incidents of torn containment liners, discharges of pollution into streams, and failure to contain drill cuttings, but I think you get the picture. Like most of the drillers in Pennsylvania, Chief frequently violates the rules designed to protect the environment, and then just as frequently fails to mention their accidents to the DEP until they are caught. For these violations, **Chief was fined \$20,500**.

But perhaps Chief is a rogue operator, and **we should look instead at one of the responsible drillers**.

Anadarko Petroleum has become the **poster child** of those who want to believe that **hydro-fracking can be done in a safe and responsible manner**. But the DEP's list of violations suggests that Anadarko has had problems following the rules established to protect us. **In 2010 Anadarko was cited for 80 violations**. While many of these violations were for minor infractions, others were of a more serious nature.

The best defense against gas migration is proper cementing of the well bore casing: in 2010, Anadarko was cited **four times for inadequate cementing of their casings**. In

each of these incidents, they were also cited for failure to report the faulty cementing in the proper fashion.

Anadarko's touts its "**closed-loop system**," where no cuttings from a drilling "would ever touch the Commonwealth." This is good news, since Anadarko seems to have had **problems maintaining their containment pits** to DEP specifications. In 2010 they were cited **14 times for various infractions** concerning these pits (insufficient capacity, holes in the liner, the liner subsiding into the pit). The inspectors noted spills of wash water, diesel, oil, grease, and triethylene glycol on the pad or on the ground surrounding the pad.

On three occasions substantial amounts of chemicals touched the Commonwealth.

- On March 26th Anadarko spilled 12,000 gallons of synthetic-based mud at a drilling site in the Sproul State Forest.
- On June 15th, they discharged 150 gallons of hydraulic fluid onto the ground at a drilling site in Centre County.
- And on December 22, at another Centre County site, production fluid was released from a line that was left uncapped by a worker for at least 24 hours.

Politicians and business leaders who want to tap into the financial bonanza of the Marcellus Shale believe that if all of the gas companies were like Anadarko, we could have the benefits of drilling without any of the problems associated with this industry.

But, as these incidents suggest, **responsible drilling is a myth**. While Anadarko is indeed one of the very best of the gas companies, their activities **still represent a serious threat to the people and the environment of Pennsylvania**.

The sad truth is that the **best practices of the industry and the most rigorous enforcement of the DEP rules cannot prevent the human error** that is responsible for the incidents cited above.

The **gas industry's defense** has been that these **accidents are exceptional and are part of the inevitable risk** of producing clean, home-grown energy. They've used the **analogy that cars have accidents, but we don't ban driving**. But if a brand of car had this record of mishaps, I suspect that we might see a **recall**. Furthermore, we **don't allow cars on sidewalks**, but we do allow this accident-prone industry to operate in our state forests next to pristine trout streams. And finally, in Pennsylvania **we pull the licenses of chronically bad drivers**. No operator has been banned from drilling in Pennsylvania.

Allow me to **conclude with a summary of the risks of hydro-fracturing by someone who should know**. In **May 2006, Range Resources Corporation provided the SEC with a prospectus**. In a surprisingly forthright moment, Range Resources explained to potential investors the risks of hydro-fracturing:

"Our business is subject to operating hazards and environmental regulations that could result in substantial losses or liabilities. Oil and natural gas operations are subject to

many risks, including well blowouts, craterings, explosions, uncontrollable flows of oil, natural gas or well fluids, fires, formations with abnormal pressures, pipeline ruptures or spills, pollution, releases of toxic natural gas and other environmental hazards and risks."