

Denise Lytle

There is a moratorium on all gas drilling, hydraulic fracturing (fracking), water withdrawals for and wastewater treatment and discharges from fracking throughout the entire Delaware River Basin today, since 2010. The moratorium was put in place by the Delaware River Basin Commission (DRBC), the federal interstate agency that manages the water resources of the Delaware River Watershed. The DRBC members –the Governors of Pennsylvania, New York, New Jersey, and Delaware, and the federal government – have the responsibility of protecting the shared waters that provide 15-17 million people in all four of the Watershed states with drinking water, including New York City and Philadelphia.

The Delaware River was designated as a national Wild and Scenic River by Congress because of its outstanding features, irreplaceable resources, exceptional water quality and scenic and recreational value. These prized assets provide important economic benefit to all four states whose tributaries flow to the Delaware River. These values are gravely jeopardized by fracking and its polluting operations and must be protected for the public and future generations. The entire nontidal Delaware River is protected by DRBC's Special Protection Waters regulations that do not allow water quality to be diminished in any way. We are dependent on that protection to keep our water safe.

After exhaustive study, the State of New York prohibited fracking based on environmental and public health analysis. The NY Department of Health concluded that the overall weight of the evidence demonstrated the likelihood that adverse health outcomes and environmental impacts from fracking could not be prevented, leading to the Governor's decision to ban high volume hydraulic fracturing in the state.

The State of Maryland permanently banned fracking after 2 years of study, based on the potential for adverse public health and environmental impacts. The natural gas industry has received unprecedented exemptions from our nation's most important environmental and public health laws, including the Safe Drinking Water Act, Clean Air Act, and the Clean Water Act.

There is significant evidence that natural gas development, and its related operations, which include all the phases of the hydraulic fracturing ("fracking") process, from the first stage of industrial land preparation; to the storage, handling, and use of chemicals and additives for extraction and stimulation; to drilling and fracking; to the withdrawal of and degradation of large volumes of water and its discharge and disposal as waste, has substantial adverse effects on public health, property interests, agriculture, and on our air, water, and land. The most recent statistical analysis of the body of scientific literature by the Concerned Health Professionals of New York and Physicians for Social Responsibility, 685 peer-reviewed papers examining gas drilling and/or hydraulic fracturing ("fracking") were reviewed and the overwhelming majority of studies found evidence of or potential adverse impacts on water, air, and human health.

Pennsylvania Department of Environmental Protection (PADEP) has determined that there are 301 cases of private water well contamination caused by oil and gas

operations in the Commonwealth; over 4,400 water complaints related to oil and gas have been filed by the public with PADEP. Between 2004 and 11.2016, PADEP lists 9,443 public complaints about environmental problems in shale gas drilling areas.

EPA's most recently released fracking study provides scientific evidence that fracking activities can impact drinking water resources and includes water impacts from shale gas in the Pennsylvania community of Dimock.

Fracking pollutes groundwater, destroying the quality of aquifers for generations to come. The chemicals in fracking fluids will migrate to drinking water aquifers and to the surface – it is not a question of "if", but "when". Considering groundwater flow, time, and the corrosive down hole environment created by gas extraction processes, including the lack of durability of the cement sealant and steel well casings, aquifers and surface waters are not sufficiently isolated from the toxic fluids and deep geology pollutants that are distributed by drilling and fracking. Aquifers could be impacted quickly, such as when there is a faulty cement seal or casing during construction, or over time. But it is certain that the life of the cement and/or steel (usually 80 to 100 years or less) is less than the life of the aquifer - so even if there is no evidence in the near term, the eventual pollution likely occur in less than a century-ruining water sources for the generations that will follow. The potential for fracking fluids to move from the production zone of a gas well to water resources "cannot be engineered out of the process" (Gassiat et al. 2013). In other words, the process of injecting fluids into and fracturing the shale causes the potential pollution problem." Contaminated fluids from the fracking process can move from the deep shale to water resources through various pathways including fractures and natural vertical flow, in thousands of years or in less than ten years, polluting groundwater. Natural gas is primarily methane, a greenhouse gas 86 times more efficient at warming the atmosphere than carbon over a 20 year time frame and its effects persist for hundreds of years. The well documented vented and fugitive losses from natural gas systems contribute to atmospheric warming; current technology and practices have not controlled these releases. The emissions from shale gas development are so great that it is projected that their release from the build out of Pennsylvania's Marcellus shale will prevent the achievement of global warming goals in the state, accelerating climate change. Climate change impacts on the basin's water resources include changes in precipitation and runoff that increase flooding and drought, impairment of habitats and water quality (including salt water intrusion to Delaware Estuary water supplies) and sea level rise.

Changes to stream water quality occur where gas drilling and related activities are located. For instance, a publication of the Proceedings of the National Academy of Sciences found streams adjacent to gas wells are negatively impacted by runoff and sedimentation (Total Suspended Solids), harming benthic life, fish and wildlife and causing streams to be eroded and destabilized. Substantial damage is caused by the toxic wastewater produced by fracking which contains many dangerous pollutants, including naturally occurring radioactive materials, that cannot be fully removed by treatment and those damages can substantially harm the water quality of our streams and the life in them. Pollutants will inevitably spread downstream to negatively impact all of the watershed states, the habitats, fish, wildlife, and recreational values of the river and our vulnerable drinking water supplies.

Fracking uses proppant such as silica sand that is mined in the Midwest, states such as Wisconsin, Minnesota, and Iowa, to prop open the fractures in the rock

caused by the fracking process. The sand mining activities are having devastating impacts in the sand regions and pose serious health impacts for workers. The sand is primarily transported by rail, often on heavy, mile-long trains, and then offloaded onto trucks to be carried into the well site.

For the local region, fracking and its activities will cause increased truck traffic. Every gas well results in at least 1400 truck trips to bring in and take out chemicals, fracking proppants, equipment, water and wastewater. As well bores lengthen, the number of truck trips increase up to 2200 per well. Air emissions and water pollution have greater adverse health impacts on those who reside, work, go to school, or frequent the zone within approximately 2 miles from the gas operation. Studies show that those closest have greater exposure and are more likely to develop disease and other health problems. Noise, lights, and changes in quality of life occur in areas where gas drilling and related operations occur. Drilling of a gas well, for instance, takes many days and cannot be interrupted, causing round the clock noise and lights.