



**Oral Testimony of Tracy Carluccio, Delaware Riverkeeper Network  
Before the Science Advisory Board Hydraulic Fracturing Research Advisory Panel  
Regarding the review of the U.S. Environmental Protection Agency  
Draft Assessment Report on Hydraulic Fracturing  
October 28, 2015**

The Delaware Riverkeeper Network is presenting testimony today to emphasize concerns included in our written comment, submitted in August 2015, on the U.S. Environmental Protection Agency's (EPA's) Draft Assessment Report on Hydraulic Fracturing (Draft Assessment).

EPA should not issue a Final Assessment based on this Draft Assessment. We ask the EPA instead to start over with a more inclusive scope, to include all necessary data and on-the-ground studies that will provide the information needed for an accurate and reliable assessment.

We see two key areas of failure in the Draft Assessment.

- First, the environmental impacts of hydraulic fracturing (fracking) are ignored.
- Second, EPA's reliance on poorly documented information, industry-supplied information, and the use of built-in, but unjustified, assumptions plague the credibility of the Draft Assessment.

This testimony will provide additional detail on these two areas of failure.

**First**, the environmental impacts of fracking are ignored in the Draft Assessment. Only drinking water effects are assessed and an erroneous conclusion was reached; how the impacts to water supplies were measured is extremely limited and the parameters unjustified. We agree that water supply impacts are crucial but the Draft Assessment fails to meet the charge given by Congress because the EPA narrowed its scope, turning a blind eye to the watershed environment that defines the water quality of water resources, which has resulted in this fatally flawed review. How did this happen?

- EPA acknowledges that too little of what happens underground is actually known. Therefore, it should require extensive groundwater monitoring to detect contamination of aquifers, and then undertake a data-intense assessment before issuing any conclusions about potential or occurring impacts.

- EPA concludes that fracking causes no widespread, systemic impacts on drinking water resources in the U.S., while at the same time acknowledging that they do not have the data to support this conclusion. EPA did not actually analyze for such impacts. In fact, EPA abandoned on the ground case studies in Pavillion, WY, Parker County, TX, and Dimock, PA and did not conduct its planned test site in the Marcellus, which was the cornerstone of its groundwater investigations.
- EPA did not conduct complex analysis of robust data sets. EPA admits very little pre- and post-fracking water quality data is accessible. Few long-term systematic studies have been done, and much of the needed information is inaccessible because it is considered proprietary or sealed in litigation settlements.
- EPA has reached a falsely broad conclusion from an extremely narrowed scope because, as EPA admits, it did not consider all the aspects of fracking such as: well pad development; land use changes; infrastructure development; chemical transport; sand mining and transport; the fate of closed wells; waste products outside of wastewater; fracking or injection well induced earthquakes; and human health effects. EPA should know that a review by Dr. Anthony Ingraffea and his organization of 580 peer-reviewed science, engineering, and public health publications on the actual impacts of shale gas development reveals that 94% find harmful impacts to human health, 69% find harmful impacts on water quality, and 88% find harmful impacts to air quality. The EPA must broaden its scope to include these effects. What EPA did examine was far too limited to be reliable, which leads to me to EPA's second failing we want to highlight.

**Second failing:** EPA's reliance on poorly documented information, industry-supplied information, and the use of built-in, but unjustified, assumptions plague the credibility of the Draft Assessment. Why?

- EPA accepted industry statistics without critique.
- EPA (and industry) relies on the distance between the target formation and shallow groundwater to protect that groundwater despite the fact that in some areas, fracking occurs very near the base of shallow aquifers<sup>1</sup> or in parts of aquifers.
- EPA assumes few out of formation fractures occur but offers no data to support this. Out-of-formation fractures provide pathways for fracking fluid to leave the target formation and reach formations closer to shallow groundwater in more transmissive formations, increasing the potential pathways to groundwater.

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<sup>1</sup> Between 2009 and 2010, 20% of 23,000 fracked wells, or 4600 wells, were less than 2000 feet below shallow groundwater aquifers.

- EPA fails to consider effects from the fracking of multiple wells including changes in permeability over large areas, and changing groundwater flow, including allowing large-scale brine movement upward toward shallow groundwater.
- EPA does not address problems with groundwater contamination from wells that undergo fracking for a second time, which is more and more prevalent.
- Marcellus Shale contains naturally occurring radioactive material (NORM) at concentrations much higher than at background at the earth's surface. In Pennsylvania, Radium-226 concentrations in unfiltered brine samples were elevated, ranging from 40.5 to 26,600 pCi/L, compared to the drinking water standard, 5 pCi/L. EPA has the authority to regulate all Naturally Occurring Radioactive Materials (NORM), yet the agency does not examine or acknowledge the dangers of not knowing the ultimate disposition of these hazardous radioactive materials.
- Some dangerous constituents in fracking wastewater, such as bromide, are not easily removed by existing treatment systems nor are they easily treated at water treatment plants, posing pressing water quality supply problems in fracked regions that are not acknowledged by EPA.
- Onsite "reuse" or "recycling" facilities that use fracking wastewater do not require National Pollution Discharge Elimination System permits, but should because they are point discharges of pollutants and would require monitoring and produce desperately needed data. EPA has the authority to insist on adequate regulation of these facilities which have become more common in Pennsylvania, but has not. Nor does EPA adequately consider this practice as a potential contamination source in the Draft Assessment.

Many other examples of failures of the Draft Assessment are detailed in our August comment, including those based on expert reports by Tom Myers, PhD., hydrogeologist, and Marvin Resnikoff, PhD., radioactive waste expert.

In closing, Delaware Riverkeeper Network respectfully requests that EPA withdraw its unsubstantiated conclusion and not issue a final assessment based on the Draft Assessment.

Thank you for the opportunity to comment on behalf of the members of Delaware Riverkeeper Network.