Oral Comments to the SAB-Drinking Water Committee, US EPA
Re: Draft Assessment of the Potential Impacts of Hydraulic Fracturing for Oil and Gas on Drinking Water Resources

Center of Excellence in Environmental Toxicology-University of Pennsylvania

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My name is Dr. Trevor M. Penning, I am the Director of the Center of Excellence in Environmental Toxicology (CEET) at the University of Pennsylvania. CEET is the only Environmental Health Sciences Core Center in the Commonwealth of Pennsylvania funded by the National Institutes of Environmental Health Sciences (NIEHS).

CEET investigators have been concerned about the potential public health effects of hydraulic fracturing in the Marcellus Shale since this activity began in the Commonwealth. In 2012, CEET led the formation of an Inter-Center Working Group on Hydraulic Fracturing comprising of 16/20 of Environmental Health Sciences Core Centers in the nation. The working group submitted written comments to the SAB on their draft assessment on August 25, 2015, which we would like to be part of the public record. Those comments addressed concerns relating to each chapter of the draft risk assessment and will not be revisited here.

I will make a general comment and then focus on wastewater management in the Marcellus Shale region. These views are not those of NIEHS but the views of CEET investigators who have examined these issues.

General Comments

EPA states in their draft assessment that they found specific instances where water resources were contaminated but this was neither widespread nor systematic. The EPA acknowledges that significant gaps exist in knowledge. These deficiencies include a lack of pre- and post-fracturing water quality data and knowledge of the composition of the hydraulic fracturing fluid itself due to Confidential Business Information. The lack of such data makes it difficult to attribute water contamination or absence thereof to the hydraulic fracturing process. Based on this significant data gap, the EPA does not have sufficient analytical data to claim that water contamination was neither widespread nor systematic.

The EPA states that its draft assessment will not be used to set federal regulatory policy; however, it is highly likely that it will be used by policy makers to justify a "no-action" policy. We believe that the executive summary should be modified to read: *"The EPA found specific instances where water was contaminated. This was not widespread nor systematic but, since there is a lack of base line water quality data and complete disclosure of the composition of the hydraulic fracturing fluid, we find that the potential for a broader impact on drinking water resources may exist."*

I will now deal with wastewater management as it pertains to PA.

Wastewater Management

Wastewater management in PA is a major concern since there is a dearth of deep-injection wells for wastewater disposal. Of the seventy-three Centralized Water Treatment (CWT) facilities in the US identified by the EPA that treat HF wastewater, thirty-nine are located in PA. Of these, thirty are zero-discharge facilities; however, the 9 non-zero-discharge facilities handle 42% of the waste. Since the constituents of the wastewater many contain proprietary chemicals, it is not feasible to determine the effectiveness of non-zero-discharge CWT facilities in treating the waste. Because of the large volumes of wastewater processed, it is incumbent upon the EPA to establish that discharge CWTs are effective in removing all contaminants. This can only take place if there is full disclosure of the composition of the hydraulic fracturing fluid to either the EPA or a designated state authority.

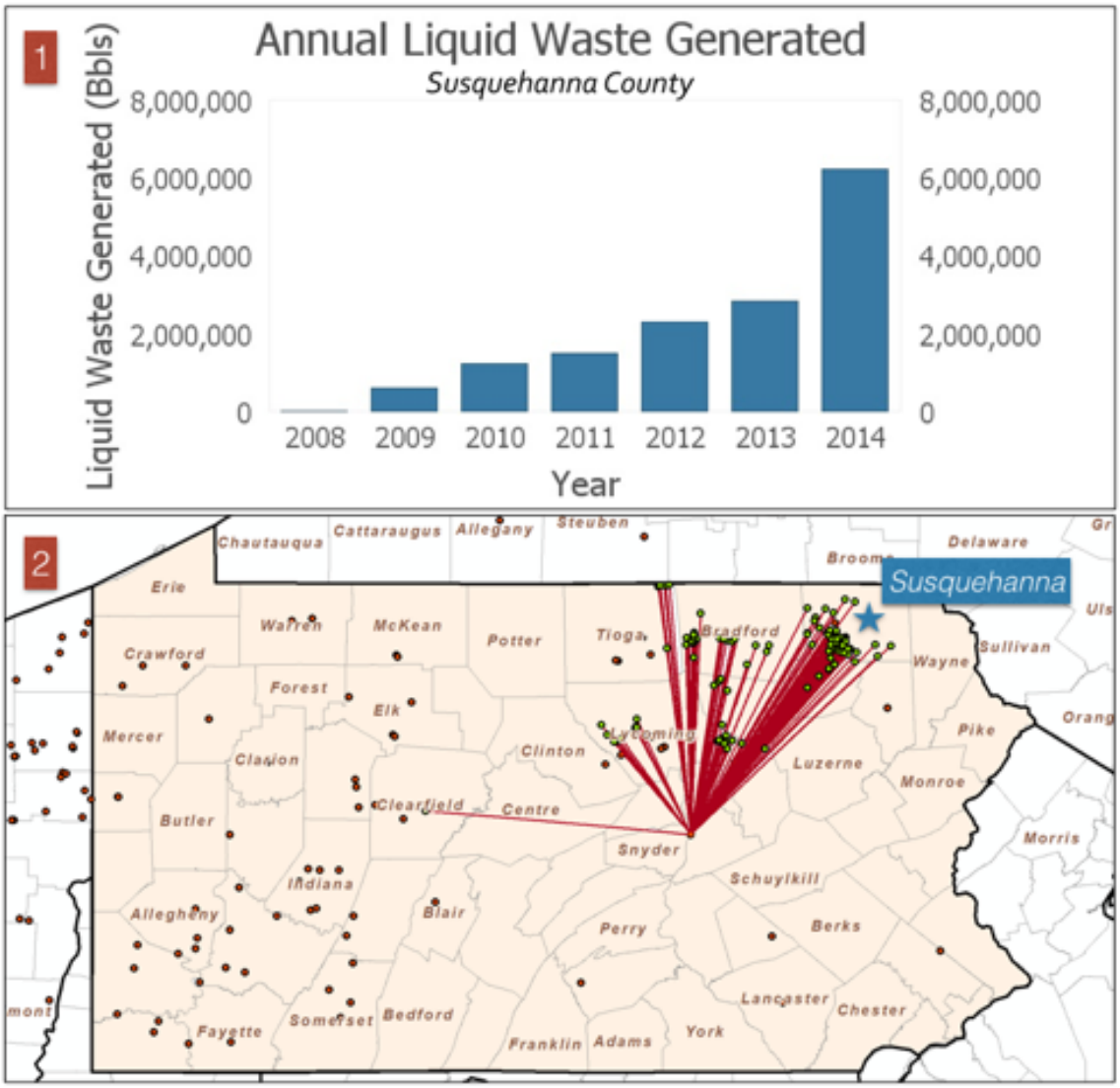

Figure 1 charts how the production of liquid waste has increased annually over the last five years due to the saturating drilling now occurring in Susquehanna County. Figure 2 illustrates that a single CWT facility processes liquid waste from many unconventional wells (green dots with red lines) in Susquehanna (blue star) and neighboring counties. The red dots represent other CWT facilities that also receive liquid waste, emphasizing the magnitude of wastewater transportation and potential exposure to the waste (Data source: PA DEP database.)

The EPA report states*: "that bromide and iodides are precursors of disinfection byproducts (DBPs) that can form in the presence of organic carbon in wastewater treatment plants."*

One common DBP is trihalomethane (THM). EPA's own funded research determined that prolonged exposure to THMs can cause several types of cancers in mice and that a similar mode-of-action exists in humans
http://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.highlight/abstract/22/report/F
For this reason the EPA developed Surface Water Quality Standards based on designated uses of waste receiving waters. The report does not indicate if any of the receiving waters of the Shale waste were impaired and require a Total Maximum Daily Load to be enforced.

The EPA report identified residuals from CWTs as being a major source of solid waste. Solid waste from the Marcellus Shale accounts for 5-60% of waste deposited in landfills. However, no data were provided as to whether these landfills have secondary containment to prevent transport of the waste through the soil in rain storms or when flooding occurs, which could lead to contaminated ground water. The PA-DEP detected radium (a naturally occurring radionuclide) in the leachate from 34 of 51 landfills receiving solid waste that often exceeded their MCLs by 10-100-fold. Information of the proximity of these landfills to residential property should be part of the risk assessment. Without

knowledge of the location of these shale waste landfills, residents could be unknowingly exposed to products of the waste from the hydraulic fracturing process.

PA is a state in which EPA has granted primacy to comply with the Safe Drinking Water Act (SDWA) and the Clean Water Act but the state is only now considering regulations on the construction of holding ponds for wastewater under revisions to Act 13. While we will concede that the use of these holding ponds is on the decline in PA, by failing to act, the EPA allowed the state primacy for enforcement of the SDWA to be compromised. The EPA should state that the potential for contamination of drinking water resources exists from wastewater management in the absence of stricter regulations.

We urge the EPA to exert its regulatory authority under SDWA to protect the nation's drinking water resources. This report presents the opportunity for the Agency to practice the "pre-cautionary principle" until sufficient data are gathered and science is performed to ensure a concerned public that the preponderance of evidence indicates that no environmental risk exists from hydraulic fracturing and the residual waste it generates.

(5 min)