

2/28/11

The Environmental Protection Agency  
The Science Advisory Board Office  
Ronald Regan Building  
1300 Pennsylvania Avenue (Suite 31150)  
Washington, DC 20004

Att: Mr. Edward Hanlon  
Designated Federal Officer

email: hanlon.edward@epa.gov

Dear Mr. Hanlon,

The Croton Watershed Clean Water Coalition (CWCWC), Inc., is a not-for-profit coalition of over 50 community, housing, environmental and religious groups. Although protection of the East-of-Hudson (EOH) watershed is our main focus, we are also concerned with developments in the West-of-Hudson (WOH) areas since most of our drinking EOH water originates WOH. The possibility of high-volume hydraulic hydrofracturing (fracking) in those areas is, therefore, a deep concern.

#### Definition of hydraulic fracturing

We are concerned by the lack of a precise definition of "hydraulic fracturing". We assume that it means fracturing with a horizontal component since both the Science Advisory Board's (SAB) June 24, 2010 response to the EPA's request to review its Scoping Materials for Potential Relationship between Hydraulic Fracturing and Drinking Water Resources and the EPA's 2/7/11, Fig. 1 Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources refer to large volume water withdrawals from ground and surface waters. Since vertical wells require a maximum of 80,000 gallons per frack, whereas horizontal wells can require from 3 million to 8 million gallons, we infer that only horizontal wells are being considered although this does not appear to have been made explicit. We urge EPA to include vertical wells. The widespread contamination of drinking water wells in Dimock, PA was caused by vertical drilling.

The EPA and the SAB owe it to their stakeholders to clarify their definitions.

## Scope of Study

The EPA has been allotted minimal funding and minimal time to carry out an extremely complex study. In view of these limitations, in its June 24th 2010 response, the SAB advises that only (1) "The research planning team should consider performance of in-depth studies at five to ten different locations selected to represent the full range of regional variability across the nation" (page 19). SAB also recommends that (2) "The compilation of hydraulic fracturing source fluids, flowback water and produced water that is co-mingled with the flowback water, and the sources of the constituents need to be understood..." (page 20)

It is interesting to note that the SAB recommends that only the composition of the source fluids "needs to be understood". We recommend a far stronger statement, namely: The exact chemical composition and structure of all components in the source (i.e. chemicals in the fracking fluid) fluids must be fully revealed to the EPA prior to fracking.

## Water Quantity Assessment

We agree that " [a]nother important factor to assess is the effect of hydraulic fracturing processes on water quantity". With horizontal fracking, each well within a well-pad may be fracked several times. It is possible to have as many as 10 wells within a well-pad and up to 160 wells per square-mile. That adds up to billions of gallons of water for fracking a one square-mile area. This huge amount of water is usually transported to the area by means of hundreds of heavy diesel-spewing trucks that tear up the roads and pollute the air. Air pollution eventually becomes a component of rainfall that pollutes lakes, ponds, streams, reservoirs etc..

The effects on surface and ground waters of these vast withdrawals should be included in the study. In NYS, many if not most streams are fed by groundwater. If groundwater becomes depleted, this could cause the loss of stream base-flow, an essential prerequisite for healthy stream fauna to survive. Moreover, lakes, ponds and reservoirs that are often largely replenished by streams will lose an important source of water, critical during periods of low rain or drought.

## Fundamental Research Questions

Figure 1 (page ix) of EPA's 2/7/11 "Draft Plan" outlines the scope of the proposed research.

WATER ACQUISITION - already discussed

CHEMICAL MIXING - "What are the possible impacts of releases of hydraulic fracturing fluids on drinking water resources?"

There can be no complete answer to this question until all components of the fracturing fluids are completely and openly revealed. So far, the drilling companies have not complied. The components are inferred only by post-use analysis and testing. However, it is more than probable that some will be missed and, therefore not recorded.

**WELL INJECTION** - "What are the possible impacts of the injection and fracturing process on drinking water resources?"

A horizontal hydrofrack in shale can generate pressures up to 15,000 psi, i.e., a massive explosion. This breaks up the shale rock and creates or enlarges fissures in basically unpredictable ways. Will some of the released gas eventually find its way through new fissures into an overlying aquifer? Such leakages might require only a few months - or several years.

**FLOWBACK AND PRODUCED WATER** - "What are the possible impacts of releases of flowback and produced water on drinking water resources?"

The produced water will contain elements dredged out of what were once the ancient seas several miles below the surface, whose bio-systems formed the shale. Besides high levels of brine, the NYS Marcellus shale also contains unusually high levels of Radium 226, an emitter of high-energy  $\alpha$  particles that are extremely dangerous, particularly to children, if inhaled or ingested. The Radium-226 levels are as high as 267 times the safe limit for discharge into the environment and thousands of times the limit safe for people to drink (see Abraham Lustgarten, Scientific American, November 9, 2009, or CWCWC Newsletter, September/October, 2010 at [www.newyorkwater.org](http://www.newyorkwater.org)). High volume fracking in NYS's Marcellus shale would mean that a solution must first be found on how to safely dispose of this highly radioactive waste. Since Radium-226 has a half-life of 1599 years, the problem of its safe disposal will confront many future generations.

**WASTEWATER TREATMENT AND WASTE DISPOSAL**- "What are the possible impacts of inadequate treatment of hydraulic fracturing wastewater on drinking water resources"?

For the most part, wastewater is temporarily held in plastic-lined, shallow open pits. If the plastic gets torn, the wastewater seeps into the ground. During storm events, overflow into neighboring streams, pond, wetlands and lakes can occur. Also, these open, highly polluted ponds are a threat to wildlife. In NYS, there are no sewage treatment plants that are capable of dealing with this type of waste. For the most part, it is trucked out of state. Environmental justice could be a problem. Spills are always a danger during trucking. In order to avoid these problems, some companies leave up to 80% of the frack fluid underground. Since this could lead to an accumulation of billions of gallons of radioactive brine under a square-mile drilling unit, it is essential that an analysis be carried out regarding the eventual fate of this fluid. Will it eventually leach into an overlying aquifer?

Stakeholder Input

(See p.30 of the 2/7/11 EPA Draft Plan)

As already mentioned, CWCWC is a NYS not-for-profit whose main focus is the protection and enhancement of water quality in NYS watersheds. We perceive hydraulic fracturing as an imminent threat to our uniquely high-quality and therefore, irreplaceable water resources.

The Marcellus Shale covers NYS's southern tier that includes both the NYC water supply watershed that serves 9 million people and part of the Delaware River Basin that, in total, serves 15 million people. It is essential for the future viability of this region that these vital water supplies receive maximum protection.

From *Forests, Water & People*, Drinking water supply and forest lands in the Northeast and Midwest United States, United States Department of Agriculture, Forests Service, June 2009, Map 2, page 5 shows the NYS Marcellus Shale area as predominantly either private or protected forest with a smaller area that is mainly agricultural. The Abstract states: "Forests are critically important to the supply of clean drinking water in the Northeast and Midwest portion of the United States. In this part of the country more than 52 million people depend on surface water supplies that are protected in large part by forested lands... Protecting and managing forests in source watersheds is an essential part of future for providing clean, safe drinking water that citizens can afford." As corroboration, Table 6 on "Top scoring watersheds for drinking water supply..." shows that seven out of these fourteen watersheds lie in NYS forested areas (East Branch Delaware; Middle Delaware; Schoharie; Middle Hudson; Lower Hudson; Hackensack-Passaic; Upper Delaware). If forests suffer fragmentation due to the intricate network of roads, pipelines and drilling units that are an inexorable consequence of high-volume fracking, they will no longer be viable. They will lose their unique capability of providing superb quality water. Even if the fracking process itself did not cause a single drop of water to become contaminated, its negative effect on forests would result in a disastrous decrease in water quality.

The EPA should extend its study and include water pollution directly connected to surface activities that are a consequence of fracking.

The areas of NYS's Marcellus Shale that are forested, i.e., those that supply high quality water, should be precluded from drilling for natural gas.

Water is more vital to our lives than natural gas.

Sincerely,

Marian H. Rose, Ph.D.  
Director,  
CWCWC