

From: Dr Debbie Cowden
To: Edward Hanlon/DC/USEPA/US@EPA
Date: 02/28/2011 04:25 PM
Subject: stakeholder for Scientific Advisory Board meeting March 7 & 8, 2011

Mr. Edward Hanlon
Science Advisory Board Staff Office
US Environmental Protection Agency
(Mailcode 1400R)
1200 Pennsylvania Ave., NW
Washington, DC 20460-4164

February 28, 2011

Dear Mr. Hanlon:

I am a physician in Ohio. I am very concerned about the toxicity of the various chemicals used in fracking. I am a citizen and a landowner in an area that is being leased for fracking near the Mohican forest around Loudonville, Ohio. I respectfully request that you include me as a stakeholder in the study of the "potential impacts of hydraulic fracturing on drinking water resources".

My concerns are as follows:

- 1) There is a lack of data gathering before and after deep hydraulic fracturing in numerous states. (I understand that federal law exempted companies from paying attention to previously enacted air and water laws.) The multitudes of anecdotal reports of water contamination are quite suspicious. Recall that only 3% of water on this planet is fresh and over 5 billion people on this planet depend on this water to sustain life. The human can survive only three days without precious water. Water that is impure with chemicals and toxins will slowly kill us.
- 2) The lack of protection for workers exposed to these toxins. I've seen photos and video and the workers appear to be in t-shirts and hard hats. No respirators were seen. They do not always appear to have gloves on. The hard hats will not protect them from inhaled chemicals nor from skin absorption of water that is sprayed into the air, or chemicals that are evaporated into air.
- 3) The concern of groundwater contamination as they drill down and even more so as they drill laterally and inject toxic chemicals.

4) The equal concern about contamination of groundwater from open pit storage of water that comes back up from fracked wells.
(airborn contamination is likely with open pits as well).

5) Increasing reports in the media of spills, explosions, and fires from these well areas, including the one in Avella, PA just last week. The huge flamees surrounding all those trucks of toxic chemicals were impressive in the video I saw. There was almost certainly airborne contaminantion of surface water with multiple chemicals and ash from that fire. Surface Water in a 5-10 mile radius was likely affected. People live in that affected 5-10 mile area as well.

***Finally, I would like to address the toxicity from the perspective of multiple simultaneous chemical exposures through contaminated water.

6) There is preliminary evidence that when people are exposed to a multitude of chemicals at the same time they experience negative affects at lower doses than if exposed to only one chemical at a time. To understand this,you need to be familiar with the chemical and medical applications of the concept of LD50: This is the lethal dose of a material that causes 50% of lab animals exposed to it to die. LD 50's have been established for numerous chemicals and toxins. The problem is that they were all arrived at by exposing those animals to ONLY ONE chemical at a time.

There have been a few recent studies exposing animals to several chemicals at once. These show that the LD 50's are much lower (animals die at a much lower level of contamination) when there is more than one chemical that they are exposed to simultaneously. This is likely true for people as well and it makes sense. If exposed to 3 (or 300) chemicals at once, likely more than one of them are acting at the same organ or organ system or receptor, so at a much lower dose the excretion pathways would be overwhelmed and physiological damage would occur. So if there were 3 or 10 (or more) toxic chemicals in water, even if all were below the "upper limit" of toxicity, they might do significant or irreversible damage even though none of them are actually at the "known" toxic level. Because of the number of chemicals and likely interaction at certain receptor sites and body systems, they are toxic at much lower levels.

This has huge implications for water contaminated with more than one chemical simultaneously, such as with Fracking. Even if the levels were not above the upper limit, there could be significant and irreversible damage occurring due to the increased number of chemicals involved simultaneously. Long term exposure to water that is so contaminated would give a slow but progressive worsening of health over days to years.

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