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Statement for the EPA Hydraulic Fracturing Public Informational Meeting

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Thank you for the opportunity to speak, and thank you for taking on this study of hydraulic fracturing. For identification, I am an environmental scientist and have been a professor at Cornell for 25 years. I am here as a private citizen, and not as a representative of Cornell. I have worked on water quality effects from oil and gas development since 1976 and on global warming and the role of trace gases in global radiative forcing since the 1980s.

I commend the EPA and the Office of Research and Development for their comprehensive approach to the issue.

There is a desperate need for more thorough and objective analysis of the environmental consequences of shale-gas development. Earlier this year, the Council of Scientific Society Presidents (CSSP) wrote to President Obama and senior officials in the administration making precisely this point. The Council is an umbrella group representing 1.4 million scientists from 150 different disciplines in the US. I am co-chair of their Committee on Energy & Environment and am authorized by the Council to provide you with a copy of the statement. The Council recognizes the urgent need to address global climate disruption, and urges the government to take urgent actions. However, the solutions to be taken must have a strong basis in objective information. The Council specifically noted that there is no such objective information base for the shale gas, and that shale gas may actually aggravate the release of greenhouse gases while causing other pollution as well, rather than help mitigate global change. The full text of the CSSP letter is available at
http://www.eeb.cornell.edu/howarth/Howarth_Energy%20and%20Environment.html

In the limited time I have, please let me further address the greenhouse gas emissions from shale gas and how this topic intersects with the EPA study on water pollution. I am funded by internal funds at Cornell and by the Park Foundation to critically examine greenhouse gas emissions from Marcellus Shale gas development. Our goal is to submit a peer-reviewed manuscript for publication later this year. One often hears the claim that natural gas is a clean fuel that produces only half the greenhouse emissions as coal when burned, and that gas is therefore a good transitional fuel for the next couple of decades to reduce our use of coal. This claim is technically true, but highly misleading, as it addresses only the emissions from burning the fuel. In our study, we are also looking at the emissions from the fossil fuel energy that must be invested to develop and market the gas – the costs of trucking water and wastes, of running drilling equipment and compressors. And we are looking at the consequences of leakage of

methane. Methane is the main ingredient of natural gas, and is a greenhouse gas that is 72-fold more potent in radiative forcing than carbon dioxide (when compared on a 20-year time frame). As a result, even small methane leakages can have a large influence on the greenhouse-gas footprint of shale gas development. Our preliminary results indicate that this greenhouse-gas footprint of Marcellus Shale gas may be quite large, probably at least twice as great as the emissions from just the burning of the gas, and quite possibly several fold larger. That is, shale gas is not a clean fuel, and appears to be a poor choice as a transitional fuel over the coming decades if the US is serious about addressing global climate disruption. I am happy to share the details of the analysis with EPA.

One of the biggest uncertainties in our analysis of the greenhouse-gas footprint is the flux of methane to the atmosphere from groundwater sources. Shale gas development clearly has the potential to contaminate surficial groundwater with methane, as shown by the large number of incidences of explosions and contaminated wells in Pennsylvania, Wyoming, and Ohio in recent years. This poses a safety and public health concern. But it also represents a pathway for methane leakage to the atmosphere. The concentrations of methane necessary for an explosion are at least 10,000-fold higher than those normally in the atmosphere, and this leakage from contaminated groundwater is probably quite significant in terms of the greenhouse-gas footprint of shale gas. At the moment, we have been unable to compile enough data on the spatial extent of groundwater contamination, and on the flows and fates of associated groundwater, for a robust estimate of this leakage to the atmosphere. I hope that the EPA study can help in this regard.

Finally, I note that although shale gas development has clearly contaminated groundwater and drinking water wells with methane, the mechanism or mechanisms leading to this contamination remain uncertain. Is the contamination primarily the result of poor well construction and cementing? Do the high pressures of hydraulic fracturing aggravate problems with poor well construction and cementing? Is there also potential for hydraulic fracturing to increase flow paths to the surface aside from the well itself, as for example by interacting with natural fractures and fissures? These are topics which should be part of the EPA study.

Again, I commend EPA for the comprehensive and thorough approach they have so far demonstrated in this study. I would be happy to assist with the study in any way I can.

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