IPAMS
Independent Petroleum Association of Mountain States

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Via email: hanlon.edward@epa.gov

Edward Hanlon
Designated Federal Officer
U.S. Environmental Protection Agency
Mail code: 1400F
1200 Pennsylvania Avenue NW
Washington, DC 20460

RE: Comments on the Scoping Materials for the Initial Design of EPA Research Study on Potential Relationships Between Hydraulic Fracturing and Drinking Water Resources dated March 2010

Dear Mr. Hanlon:

The Independent Petroleum Association of Mountain States (IPAMS) represents over 420 companies engaged in environmentally-responsible exploration and production of natural gas and oil in the Intermountain West. IPAMS appreciates the opportunity to provide written comments to EPA on the scoping materials for the Initial Design of the EPA Research Study on Potential Relationships Between Hydraulic Fracturing and Drinking Water Resources.

IPAMS believes that the proposed scope is much too broad, as it goes far beyond the intent of Congress when it appropriated the funding for the study "..on the relationship between hydraulic fracturing and drinking water..." While many of the research topics proposed are directly on point, several would expand the scope of the study extensively to air quality, wildlife, social analysis, and other tangential topics. IPAMS believes EPA should focus its study on likely pathways of exposure and whether the environmental risk is being managed properly. By focusing the study on likely pathways of exposure, protection of the surrounding environment is assured within an acceptable risk at a reasonable cost to society. Focusing on miniscule risks and potential but unlikely exposure routes could result in an overly broad study and subsequent regulation that imposes inordinate cost for negligible environmental gain.

Hydraulic fracturing (HF) typically takes place thousands of feet below underground sources of drinking water (USDW). The pressure of intervening rock layers means that fracture fluids cannot migrate to USDW except over geologic time periods. Any migration over a geologic time period would include the

hydrocarbons found naturally in the rock layers, which are much more toxic than fracturing fluids. In the case of coalbed methane (CBM), gas is extracted from coal seams at less depth and in rock layers that are often already in communication with non-potable aquifers naturally rendered outside the drinking water standard. This is the case with several CBM locations in the West, and this difference in hydrology and geology must be considered in the study. These variances across the country point to the states remaining the proper jurisdiction for regulating HF.

IPAMS strongly believes that the study should draw extensively on the input and contributions of state regulators who have experience regulating HF for over sixty years without a single case of contamination of drinking water. State regulators already have the processes and procedures in place to ensure well integrity and prevent a path for HF fluids to reach aquifers. IPAMS recommends that organizations such as the Interstate Oil and Gas Compact Commission (IOGCC) and the Ground Water Protection Council (GWPC), as bodies of regulators who have worked tirelessly to ensure that regulations in the states are strong, should be key participants in the study.

IPAMS would also like to draw EPA's attention to the work of Dr. Jennifer Miskimins, professor at the Colorado School of Mines. She has extensive research experience in HF and the analysis of fracture migration and the potential for communication of fluids between underlying formations and USDWs.

Specific comments are detailed below by major section of the scoping document.

Characterization of the HF Lifecycle

IPAMS recommends that state regulators, IOGCC and the GWPC be given the lead in this portion of the study. These experienced regulators can answer most of the questions posed in this section of the scoping document, and can demonstrate how existing regulation prevents routes of exposure to USDWs. Their lead on this portion of the study would enable EPA to efficiently employ its limited budget for the study.

IPAMS provides comments on the following questions in this section as follows:

Do site preparation and well construction activities have potential to impact water resources? Site construction and drilling/well construction are beyond the scope of this study, which is supposed to be on HF.

What criteria should be considered in evaluating the proximity of drinking water resources (underground and surface) and water availability to siting HF activities? The study should consider the extreme distance, in most cases, from the formations being hydraulically fracture stimulated to USDW. The fact that communication between those rock layers and aquifers that sit at less than 1,000 feet would occur over geologic time is the main consideration for determining whether there's a pathway of exposure. Where migration occurs, as in the case of natural seeps of oil and gas to the surface, the toxicity of the hydrocarbons is much higher than of any of the HF fluids, which are mostly common household chemicals that break down naturally much quicker than over a geologic timescale.

To what extent may other nearby well penetrations, especially abandoned wells, affect potential impacts from HF activities? Again, state regulators have been handling spacing of wells and plugging of abandoned wells for decades. They should have the lead in answering these types of questions. For states with less regulatory history, the State Review of Oil and Natural Gas Environmental Regulations (STRONGER) program of the IOGCC is available to help implement strong protections. State regulators ensure that wells are constructed so that there's not communication outside the wellbore, much less with nearby wells. States regulate the plugging and abandoning of wells to ensure they are properly cemented and that all flows are halted.

What data and information are needed to demonstrate the effectiveness of best management practices (BMPs) for the storage, treatment, and disposal of produced water? What are the constraints on recycling the produced water rather than disposal? Produced water varies dramatically among basins, and plays, and even among individual wells within an area. Therefore, BMPs must be tailored to the basin. Likewise, water resource issues vary greatly from region to region. Again, states are closest to the water issues on the ground, and the best jurisdiction for handling produced water. Note: Industry already must comply with the Safe Drinking Water Act (SDWA) for handling HF fluids on the surface including disposal.

What tools and analytical methods are needed to characterize emissions from HF and associated gas production operations? What data and information are needed to optimize BMPs for vapor emissions during HF operations? These questions are clearly outside the scope of the study. Water, not air quality, is the focus of this study. Introducing an evaluation of air emissions is not appropriate.

IPAMS would like to suggest the study address the following questions related to the HF lifecycle:

- What state regulations are in place to ensure well integrity so that there is no communication of frack fluid with USDW?
- What is the safety record for fracking in the United States? Have there been any cases of fracking impacting USDW?

Potential Relationship to Drinking Water Resources

Several questions in this section address impacts of natural gas development on water supplies. While industry continues to improve technology and practices to reduce water needs and increase the reuse of water, it's important to understand that water usage for developing natural gas is not excessive compared to other agricultural and industrial uses, and compared to other energy sources. The US Department of the Interior and the US Geological Survey recently released *Estimated Use of*

Water in the United States in 2005[i] which includes water use comparisons economic sectors.

- Thermoelectric power: 41 percent
- Irrigation (agriculture): 37 percent
- Public supply: 13 percent
- Industrial: 5 percent
- Aquaculture: 2.51 percent
- Domestic (self-supplied): 1 percent
- Livestock (agriculture): less than 1 percent
- Mining (including natural gas and oil development): less than1 percent

Further, a paper presented at a the GWPC Water/Energy Sustainability Symposium in September 2009 compared the water use per 1 million British thermal units of energy sources, and found the following[ii]:

- Deep shale natural gas, including HF 0.60-1.80 gallons
- Natural gas 1-3 gallons
- Coal without slurry transport 2-8 gallons
- Nuclear 8-14 gallons
- Conventional oil 8-20 gallons
- Coal with slurry transport 13-32 gallons
- Synfuel-coal gasification 11-26 gallons
- Coal 13-32 gallons
- Oil shale 22-56 gallons
- Tar sands/oil sands 27-68 gallons
- Fuel ethanol from corn 2,510-29,100 gallons
- Biodiesel from soy 14,000-75,000 gallons

IPAMS requests that EPA consider relative water use in the study.

What components of the HF lifecycle could potentially lead to the contamination of drinking water sources and hydraulically connected ground and surface waters? The study should focus on likely scenarios, not all possible scenarios no matter how unlikely. Actual risk must be studied, not all potential scenarios. If the study focuses, as it should, on the key question of whether existing regulatory structures effectively manage the environmental risks of HF, then EPA could focus limited resources appropriately.

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[i] Kenny, J.F., Barber, N.L., Hutson, S.S., Linsey, K.S., Lovelace, J.K., and Maupin, M.A., 2009, *Estimated Use of Water in the United States in 2005*, U.S. Geological Survey Circular 1344, http://www.gwpc.org/e-library/documents/general/Estimated%20Use%20of%20Water%20in%20the%20United%20States%20in%202005.pdf

[ii] Mantell, M.E., 2009. Deep Shale Natural Gas: Abundant, Affordable, and Surprisingly Water Efficient. http://www.energyindepth.org/wp-content/uploads/2009/03/MMantell_GWPC_Water_Energy_Paper_Final.pdf.

To what extent does surface water withdrawal for HF purposes potentially affect drinking water and/or impact flow regimes in streams and their role in maintaining ecosystem services? To what extent does ground water withdrawal for HF purposes affect water levels and the usability of smaller aquifers for water supplies, both through availability of water, and geochemical changes caused by lowered water levels? Concerns about water withdrawals should be balanced with the low water use of natural gas development compared to other economic activity. The study must account for regional variability, and again highlights the advantage of state regulation of HF.

What types of monitoring and modeling tools are needed to determine if there is sufficient capacity available and/or feasible for wastewater treatment or underground injection? What treatment technologies are effective for managing HF flowback and/or produced fluids? What are the impacts of these contaminants on wastewater treatment plant facility operations? These questions indicate broad expansion of scope from the fundamental focus on pathways of exposure of HF fluids to a broad analysis of all water issues surrounding HF. These activities are already federally regulated, for example by the SDWA.

Are there viable fracturing alternatives that may have less potential for impacts to drinking water resources? If so, are they economically viable? What are the tradeoffs? It's hard to imagine another process that has less impact to drinking water, since there hasn't been a case in the sixty year history of HF where a USDW have been contaminated. HF is not an optional process - 95% of wells are fracked in the mountain states. Our members simply could not continue producing 27% of the nation's natural gas from unconventional resources, which are the vast majority in the West, without HF.

IPAMS suggest the following questions be addressed by the study:

- What naturally occurring elements in the soil and geology are found in the aquifers being tested?
- What residential and other industrial activities could be potential sources of any compounds found in USDW?
- How does natural gas development water use compare to other industries and agriculture?

Potential Health and Environmental Risks

The introductory paragraph to this section in the scoping document, if remaining through to the study design, would further explode the scope of the study. Air and food exposures are extremely outside the scope as intended by Congress, as is the spread of invasive or non-native species, wildlife, crops, and livestock. If EPA focuses on the key question of whether existing regulatory structures effectively manage the risk of pathways of contamination from HF, then it does not have to expend time and resources on evaluating the impact further removed from the well head on food, livestock, wildlife, etc.

What are the socioeconomic considerations that communities bring to perceptions of environmental impacts? Are there social/behavioral science research approaches that could be developed to generate increased awareness of the potential environmental benefits and potential risks of HF in

the context of community and environmental protection? Socioeconomic evaluation and social/behavioral science research are completely outside the scope of an objective study intended to gather scientific data. Perceptions of environmental impact have been fanned by environmental groups with an agenda of halting energy production in the United States. Despite the fact that state regulators have a 60 year exemplary safety record, perceptions based on unfound fears continue. The best way to put to rest those perceptions are through an objective scientific study with clearly scoped boundaries. The public does not always have a good understanding of the safety of industrial processes nor an understanding of regulatory processes, and it is the job of regulators to provide objective scientific data to help the public understand the relative risks, not let those perceptions drive the science.

What community health and environmental justice issues may be associated with HF activities? Again, analyzing environmental justice issues has no place in an objective scientific study and should be beyond the scope of the study. IPAMS believes a better way to address environmental justice is to ensure regulatory risks are properly balanced with benefits, so that onerous regulations are not put in place that take productive resources away from creating jobs and economic activity for negligible environmental benefit. Environmental protection has historically risen as wealth increases in a society, and as the nation has the economic means to devote to environmental protection. Natural gas not only helps to power our economy at reasonable cost, but it provides high-paying jobs in communities where development occurs that lead to a rise in living standards. IPAMS believes economic growth and low-cost energy are the best ways to ensure environmental justice.

What are appropriate biological endpoints that could be used to evaluate ecological risks (aquatic, semi-aquatic, terrestrial; surface and subsurface) and establish biomonitoring methods for detecting unacceptable levels of exposure in target populations? Again this is far beyond what the scope should be. If the regulatory structures prevent pathways to drinking water, there is no risk to wildlife, livestock, humans, etc.

IPAMS suggests the following questions be included:

- What is the cost benefit of additional regulation?
- How will any additional cost of regulation reduce capital available for developing natural gas?
- How will that cost be born by consumers?
- Is the cost and resultant reduction in energy development worth the incremental reduction of risk resulting from additional regulation?

Potential Elements of Research Study

Determine the potential range of chemical constituents that make up HF fluids. GWPC has already gathered that data.[iii] Several state regulators already list all potential compounds on their web sites.

Evaluate and characterize the potential for community health and environmental justice issues associated with HF activities. Again, IPAMS strongly believes that this type of analysis should not

[iii] *Modern Shale Gas Development in the United State: A Primer*, Ground Water Protection Council and ALL Consulting, April 2009, p. 63.

be included in this study. By providing the credible, objective data on the risk to drinking water contamination, community health is protected. Environmental justice is served by affordable energy and the good jobs the come with development of natural gas.

Assess the state of green chemical design for HF fluids. Recognition must be made of the fact that HF fluids vary by geology, so what works in one formation in a particular area does not necessarily work in that same formation within a different field, or in different formations. Regulation should focus on reducing and controlling risk, not specifying the composition of HF fluids.

Thank you for your consideration of IPAMS' comments. If you have any questions please contact me at (303) 623-0987, ksgamma@ipams.org.

Sincerely,

Kathleen M. Sgamma
Director of Government Affairs