February 28, 2011

Mr. Edward Hanlon
Designated Federal Officer
EPA Science Advisory Board (1400F)
US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: Request for Review of the *Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources*

This statement is submitted on behalf of the Independent Petroleum Association of America (IPAA) and Energy In Depth (EID) with regard to the Environmental Protection Agency (EPA) Office of Research and Development's (ORD) *Draft Plan to Study the Potential Impacts of Hydraulic Fracturing on Drinking Water Resources* (Study Design Draft) document of February 2011.

The IPAA represents the thousands of independent oil and natural gas producers that develop 90 percent of US wells and produce over 74 percent of US natural gas. Approximately 90 percent of these wells now require the use of hydraulic fracturing. EID is a coalition of national, regional and state trade association as well as oil and natural gas companies that is dedicated to providing information on the environmental issues associated with the development of these resources.

As we have stated in comments regarding earlier scoping documents, we believe that the study needs to be framed around a key threshold question – whether the regulatory structures effectively manage the environmental risks of the fracturing process. If these risks are well managed, the other questions are meaningless. If the regulatory structures prevent pathways to drinking water, there is no risk. In this context, we have concerns in several areas regarding the Study Design Draft.

First, we remain concerned about the scope of the study. As we have stated in the past, the study mandate addresses the role of hydraulic fracturing with regard to drinking water. The Study Design Draft continues a pattern of sweeping issues that are not unique to hydraulic fracturing into the study. Second, we believe that the role of state regulators and the inherent protections from state regulations are not being adequately included in the study. Third, the Study Design Draft focus on retrospective analysis relative to prospective analysis raises issues regarding the appropriateness of the retrospective analysis, its structure and the reporting of that analysis while the prospective assessments are incomplete. Fourth, many of the referenced materials in the Study Design Draft are not science based. In fact, the sources are advocates opposing fracturing and the referenced materials are assertions that are not corroborated or accurate. If the Study Design Draft is being influenced by these allegations, it will skew the orientation of the study and diminish its value. These issues are addressed in more detail below.

Study Scope

Natural gas and oil production has occurred in the United States for more than 150 years. Hydraulic fracturing technology developed during that past 60 years. Fracturing is a temporal element of the production process that occurs during the drilling phase. Unfortunately, the Study Design Draft fails to effectively distinguish between those issues that are fracturing related and those that exist at all natural gas and oil production activities.

For example, EPA states in the Study Design Draft:

> The hydraulic fracturing process begins with exploring possible well sites, followed by selecting and preparing an appropriate site.

This is wholly incorrect. The fracturing process has nothing to do with selecting or preparing sites. Site selection is the result of comprehensive geological and geophysical analysis that relies on such technologies as 3-D and 4-D seismic assessments. Preparation of the drilling site must be done for all sites whether fracturing occurs or not. The drilling process begins after receiving appropriate permit authority from the state regulatory agency (or the federal regulatory agency on federal resource land). As the drilling process progresses, it requires the insertion of steel casing that is cemented in place as the well bore penetrates ground water formations (including those that might be drinking water sources). Subsequently, particularly in shale formations, the well bore will be turned horizontally and drilled through the formation. The fracturing process occurs following completion of the well bore and may last from a few hours to a few days. Once the fracturing process is complete, the well is conditioned for production. Wells can be fractured again if the production conditions indicate additional fracturing is necessary. However, in all instances, fracturing is a short term action in the larger drilling and production process – a process that occurs whether fracturing is utilized or not.

EPA proposes to address in the study issues associated with the volumes of water withdrawals from ground and surface water sources. Drinking water volume management has been and continues to be a significant state responsibility. State water rights laws have been constructed over the past two hundred plus years. Water use – for any purpose – will be subject to a legal structure that defines its acquisition. Hydraulic fracturing is no exception. Water use for the fracturing process must be obtained within this system. But, fracturing water use is not the issue; water use generally is the issue. The industry's experience varies widely. As the Study Design Draft observes with respect to water use in the Barnett Shale area:

> During the projected peak shale gas production in 2010, the total water used for gas production in the Barnett Shale was estimated to be 9.5 billion gallons. This represents 1.7 percent of the estimated total freshwater demand by all users within the Barnett Shale area (554 billion gallons)

Clearly, the impact in this area is minimal. In the Marcellus Shale, concerns about water use have drawn more attention, principally because they have been misunderstood and the state had to revise some regulations to reflect the increased demand potential. However, studies indicate that water use in the Marcellus Shale for natural gas production will be approximately 0.1 percent. These assessments suggest that the water demand issue is substantially overstated and correspondingly, the impact on drinking water would be minimal. Diverting precious study time and resources to an issue that is both managed under state laws and limited by impact is not appropriate.

While spill events occur for fracturing fluids – like all fluids that are managed – they are infrequent and a regulatory system exists that requires a response. Since spills happen during periods where the well operation is heavily staffed, action to respond and clean up is rapid. Consequently, the likelihood of finding fracturing fluid compounds that linger to the point of doing a fate and transport analysis will be remote.

The Study Design Draft discusses issues associated with the use of fracturing as a technology that "could increase or decrease the mobility of … substances, depending on their properties and the complex interactions of all processes occurring in the subsurface. For example, several of the chemicals used in fracturing fluid (e.g., acids and carbonates) are known to mobilize naturally occurring substances out of rocks and soils by changing the pH or reduction-oxidation (redox) conditions in the subsurface." While fracturing produces these events, they are not unique to fracturing. For example, acid was first used for well stimulation in 1895.[1] The existence of chemicals in produced water has been a known aspect of natural gas and oil production since its earliest days. The control of produced water has been addressed by both regulation and industry management practices for decades before hydraulic fracturing became the significant technology that it is today. While produced water management is an important environmental issue, it is not hydraulic fracturing specific and is not dominated by the fracturing process. It should not be a principal focus of the study.

The Study Design Draft also directs attention to produced water management that is only peripherally involved with hydraulic fracturing. Moreover, much of the attention relates to the use of Publicly Owned Treatment Works (POTWs). The presence of high Total Dissolved Solids (TDS) drives this attention. It is misplaced. First, the presence of high TDS has been a well known aspect of produced water management; it is a produced water issue, not a hydraulic fracturing issue. Second, discharges of produced water (including any component that is hydraulic fracturing) are regulated under federal laws – either the Clean Water Act or the Safe Drinking Water Act). POTW discharges fall under Clean Water Act regulation. Third, the POTW issue is a Marcellus Shale related issue that has been overstated. In May 2010, the Pennsylvania Department of Environmental Protection issued new regulations that require pretreatment of produced water sent to a POTW. Fourth, the industry has shifted its management of produced water in the Marcellus to stress reuse. Fifth, for other formations produced water is managed under the Safe Drinking Water Act Class II Underground Injection Control program. Sixth, these federally driven regulations address all of the environmental issues including drinking water. Consequently, directing study attention toward produced water management is unnecessary.

Unfortunately, while the Study Design Draft raises these peripheral issues that divert attention from the pathways that directly relate to hydraulic fracturing and drinking water, it fails to give attention to a key factor that reduces the risks to drinking water. The combination of horizontal drilling and hydraulic fracturing reduces the number of wells that must be drilled to produce the same amount of natural gas or oil by a factor of at least 20. These sophisticated technologies mean that one well pad not only provides more energy, it means that only one surface disturbance is required and only one well bore is needed where 20 would have been required in the past. In many areas multiple wells can be drilled from the same pad further reducing the footprint of the development in an area. In environmental terms there are three basic pathways

[1] Gray, Forest, *Petroleum Production in Nontechnical Language*, 1995, page 191.

of concern that might create drinking water risks – the producing reservoir, the well bore and the surface management of flowback from the fracturing process. The producing reservoir poses no risk because of its geological isolation from drinking water supply and these advanced technologies mean that the well bore and surface management risks are dramatically diminished. If this study intends to make realistic assessments of risks from hydraulic fracturing, this aspect must also be considered.

State Regulations and State Regulators

In the Study Design Draft, EPA states:

> Hydraulic fracturing for oil and gas production wells is typically addressed by state oil and gas boards or equivalent state natural resource agencies. However, EPA retains authority to address many issues related to hydraulic fracturing under its environmental statutes. The major statutes include the Clean Air Act; the Resource Conservation and Recovery Act; the Clean Water Act; the Safe Drinking Water Act; the Comprehensive Environmental Response, Compensation and Liability Act; the Toxic Substances Control Act; and the National Environmental Policy Act. EPA does not expect to address the efficacy of the regulatory framework as part of this investigation. However, EPA may assess existing state regulations in a separate effort.

This statement presents a perspective that raises an almost fundamental question about the value of the study. State regulatory programs – in many cases in concert with federal regulatory programs – define the framework under which hydraulic fracturing occurs and drinking water is protected. As we have stated earlier, the key question related to the fracturing process and drinking water is whether the regulatory structures effectively manage the environmental risks of the fracturing process. The statement above poses substantial concerns about the study being directed toward assessments that are well outside the real regulated circumstances in which hydraulic fracturing occurs.

Similarly, we find it hard to envision a well constructed study that does not embed the state regulators in its design and execution. No one knows the nature of the regulatory structure and the risks associated with natural gas and oil production better than the states. Yet, in reviewing the Study Design Draft, we find it lacking in presenting any clear indication of such extensive state involvement. Consequently, we believe that EPA must aggressively insinuate state regulatory experts into the execution of the study.

Retrospective and Prospective Analyses

The Study Design Draft breaks the effort into two phases. The first appears to be a report on a series of analyses of events that have occurred – the retrospective portion – which will be presented by the end of 2012. The second appears to be a report on a series of prospective analyses that will be completed in 2014. The approach raises four significant issues.

First, each of the retrospective cases is an event that has already occurred. They have already been investigated. The circumstances that led to the event have ended and action has been taken to address any environmental consequences. Why would EPA believe that its involvement at such a site will add to the understanding of the causes or consequences of the event? How can EPA expect to obtain data today that can be related to the event at the time?

Second, investigations of the events were conducted by the appropriate state and federal authorities at the time of the event. How will EPA involve these investigators?

Third, in reviewing the prior EPA and SAB documents, there is no apparent discussion of reevaluating retrospective events. This concept seems to have been created wholly outside of any proposal by either EPA or SAB. More fundamentally, it raises an issue of what further studies of prior events adds to the understanding of the risk management of hydraulic fracturing as it relates to drinking water. To our knowledge, the events that have been identified for inclusion have been addressed. The prior EPA scoping documents and the SAB response envisioned EPA assessing hydraulic fracturing going forward where baseline information has been established to determine the impact of the fracturing process on drinking water – including the effectiveness of the regulatory process to manage any risks of the operation.

Fourth, if the purpose of including the retrospective analyses is intended to provide Congress with some report on the 2012 schedule that EPA initially suggested it would meet, it falls short of a meaningful report. The study should address the issues it was intended to address and not waste funds on revisiting issues that were addressed long ago.

Sources Supporting the Study Design Draft

While many of the sources that EPA uses to describe issues associated with the scope of the study are sound – e.g., reports by state or federal agencies, there are many in the report that fail to meet a standard of being scientific or even based on scientific data. For example, in the Study Design Draft, EPA asserts:

> Fluid leakoff during hydraulic fracturing … may result in fluid migrating into drinking water aquifers (Hess, 2010; Subra, 2010; Bielo, 2010; URS Corporation, 2009).

EPA cites four sources for this statement. The first three are articles or presentations that pose the issue or assert its occurrence, but they do not scientifically document the incidents they raise. The fourth document describes a variety of issues related to its title: *Water-related issues associated with gas production in the Marcellus Shale: Additives use, flowback quality and quantities, regulations, on-site treatment, green technologies, alternate water sources, water well-testing*. But, it does not address or suggest a risk associated with fluid migrating into drinking water aquifers. Moreover, the document appears to be part of the material prepared for the New York Supplemental Generic Environmental Impact Statement On The Oil, Gas and Solution Mining Regulatory Program that addressed hydraulic fracturing – a document that concluded migration of fracturing fluids was not a likely risk.

Consequently, if EPA is using these materials as a basis for framing its study to address the allegation implied in the statement where they are referenced, EPA's basis for action falls woefully short of a scientifically supportable determination. Correspondingly, if the remainder of the Study Design Draft relies on similar documents, it needs to be rigorously reconsidered.

Conclusion

We have consistently been concerned that EPA would not design a study scope that tracks the Congressional direction. The current Study Design Draft significantly exceeds a scope related to hydraulic fracturing and drinking water. Similarly, it raises substantial questions regarding how it will accurately assess the risks of fracturing in the context of the regulatory system that

controls fracturing – including how it will utilize the expertise of the state regulators that manage those risks.

We appreciate the opportunity to provide input to the development of the EPA Research Study and will continue to participate in its execution. If additional information is required, please contact Lee Fuller

Sincerely,

Lee O. Fuller