



March, 29, 2010
Mr. Edward Hanlon
Designated Federal Officer
EPA Science Advisory Board (1400F)
US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Re: Science Advisory Board Staff Office; Notification of a Public Meeting of the Science Advisory Board; Environmental Engineering Committee Augmented for the Evaluation and Comment on EPA's Proposed Research Approach for Studying the Potential Relationships Between Hydraulic Fracturing and Drinking Water Resources

Mr. Edward Hanlon:

Noble Energy, Inc. appreciates the opportunity to submit the following comments in response to the Scoping Materials for the Initial Design of EPA Research Study on Potential Relationships Between Hydraulic Fracturing and Drinking Water Resources. Noble Energy, Inc. also endorses the comments of the other oil and gas companies and trade associations that have submitted comments.

Noble Energy, Inc. is a leading independent energy company engaged in worldwide oil and gas exploration and production. We operate primarily in the Rocky Mountains, Mid-Continent, and deepwater Gulf of Mexico areas in the United States, with key international operations offshore Israel and West Africa.

Over the past 60 years, over one million U.S. wells have been safely produced in the U.S. using the hydraulic fracturing (HF) process. Numerous federal and state laws and regulations govern the process, from initial permits to the safe disposal of fluids. The EPA, the Ground Water Protection Council and the Interstate Oil and Gas Compact Commission have all studied HF and found no threat to the environment and public health.

The primary protection of water resources is the proper construction of oil and gas producing wells and the proper surface management procedures. The states in which we operate have rules specifically to address the casing and cementing requirements to ensure groundwater and surface water isolation, reservoir isolation, and cased hole integrity for HF. The process of states regulating hydraulic fracturing has worked for many years. For example, the Wyoming Oil and Gas Conservation Commission reported in July of 2009 that there were "no documented cases of groundwater contamination from hydraulic fracture stimulations in Wyoming."

Noble Energy, Inc. would like to take the opportunity to emphasize that this study is being initiated from a congressional suggestion. We appreciate that Congress has asked EPA to



research the potential relationships between HF and drinking water. In its Fiscal Year 2010 budget report, the U.S. House of Representatives Appropriation Conference Committee identified the need for a focused study of this topic:

“The conferees urge the Agency to carry out a study on the relationship between hydraulic fracturing and drinking water, using a credible approach that relies on the best available science, as well as independent sources of information. The conferees expect the study to be conducted through a transparent, peer-reviewed process that will ensure the validity and accuracy of the data. The Agency shall consult with other Federal agencies as well as appropriate State and interstate regulatory agencies in carrying out the study, which should be prepared in accordance with the Agency's quality assurance principles.”

Noble Energy, Inc believes there are several topics that do warrant research by the EPA to help understand the congressional question regarding the relationship between HF and drinking water. The topics we suggest the EPA study focus on are as follows:

- Comprehensive evaluation of the regulatory structures currently in place for HF activities and the effectiveness of managing environmental risks with HF activities and preventing the movement of HF fluid to drinking water

State regulatory bodies have, and some are currently updating, regulations pertaining to oil and gas extraction, including HF activities. If environmental risks are well managed through these existing rules, the EPA should not waste the time and resources to evaluate the broad scope currently being proposed in the study scoping document in question. If the regulatory structures prevent pathways to drinking water, there is no risk of drinking water contamination.

We recommend that a main focus of the initial research study should include an evaluation of the state regulations implemented to protect groundwater. Collaboration with the state regulatory agencies should be considered vital to the development of this study since these agencies bear the principal responsibility to protect drinking water supplies for the population.

- Risk assessment of exposure

Based on the suggestion from Congress, we believe an evaluation of exposure pathways for drinking water that could potentially be affected by HF should be completed.

- Peer review all HF documents

We believe that government, environmental groups, and the general public's opinion of HF has been misrepresented by inadequate studies. These published papers lack some key elements that are integral to include before they can be considered scientific papers. Some of the key elements we believe are important are a non-biased approach to the study, engagement with experts in the field of the topic being researched, and peer reviews of the authored document. We believe that since some of these documents in question are main factors in the initiation of this study, and are

considered as fact by some, that they should be reviewed by a panel of expert scientists to ensure the validity of the document.

- Root cause analysis of the historical cases that state HF as the cause of drinking water contamination

We propose a root cause analysis to be conducted on the oil and/or gas well that was utilizing the HF technology that caused the alleged contamination. Also, we propose an evaluation be conducted on the water well that produced the contaminated drinking water sample. This should include an evaluation of the well designs, construction reports, maintenance reports, state well permit records, and water sampling protocols to ensure that the allegations are warranted.

- Review and comparison of wellbore design, construction, and maintenance criteria for oil, gas, water (public and private), and UIC wells

One of the main concerns that initiated this study is the contamination of groundwater from HF. Proper oil and gas well design and construction that prohibits the release of HF fluids prior to the intended geologic horizon would eliminate much of this concern. Also, improper water well design, construction, and maintenance can cause the water produced from that well to become contaminated. Lastly, underground injection control (UIC) wells are used to inject waste into underground geologic formations. This practice is commonly used across the U.S. An evaluation of the differences between oil and gas wells and UIC wells to see why HF injection is a greater risk than the injection of waste down a well.

- Field research in all major shale and CBM basins across the US

There are many differences between shale and coal bed methane (CBM) oil and gas exploration and production operation and those operations vary drastically depending on the geography in which the activities are taking place. Based on the above statement, all major shale and CBM basins across the U.S. need to be evaluated in this study.

- Modeling of fractures

Comprehensive geologic engineering models should be used to predict the full extent of fractures created during the HF process. This should include obtaining accurate rock mechanics through physical testing of the geologic formations that experience HF.

- Surface management

One of the main concerns that initiated this study is the contamination of surface water from HF. Proper oil and gas surface management practices would prohibit the unintentional release of HF fluids and would eliminate much of this concern.



- Stakeholder engagement with a large focus on a partnership with HF experts who would be found in industry

As mentioned earlier, the oil and gas industry has been using HF in its oil and gas exploration and production activities for over 60 years. We have made many advances in the science and technology of fluids, equipment, and engineering practices utilized in HF activities. Therefore, experts in the field of HF will be found in the oil and gas extraction industry and should have an integral part in the research, development, and authoring of this study.

On the other hand, Noble Energy, Inc believes there are several topics that are proposed in the HF study scoping document that do not warrant further research by the EPA. Though they are curious topics, they are not part of the congressional suggestion. We suggest the topics to be evaluated for removal from the HF study scope are:

- Full Life Cycle Assessments

We do not believe utilizing a LCA approach is an effective use of time and resources pertaining to the congressional suggested EPA study. Congress has already determined what aspects of the life cycle they want EPA to study. All other aspects of the life cycle of HF are not under question.

- Exposure pathways other than drinking water

We do not believe that evaluating exposure pathways other than the exposure pathway for drinking water contamination is an effective use of time and resources pertaining to the congressional suggested EPA study.

- Emissions

Emissions from HF procedures have very little to no effect on drinking water contamination.

- Produced water

Produced water production and management has minimal to no relationship with HF and possible drinking water contamination.

Noble Energy, Inc. appreciates the opportunity to comment on the Scoping Materials for the Initial Design of EPA Research Study on Potential Relationships Between Hydraulic Fracturing and Drinking Water Resources. Please feel free to contact Noble Energy Inc. to utilize any of our employees as resources in this upcoming study.

Very Truly Yours,

Bob Bemis
Vice President of Environmental, Health, and Safety