US EPA Hydraulic Fracturing Study
Consultation with Industry
Monday, June 21 and Wednesday, June 30, 2010*

**Due to technical difficulties on the webinar scheduled for June 21, 2010, "EPA Hydraulic Fracturing Study – Industry Consultation" was re-broadcasted on June 30, 2010.*

Meeting Summary
EPA held a meeting and concurrent webinar with industry on June 21, 2010. EPA attendees represented the Office of Research and Development, Office of Water, Office of General Counsel, and Region 3. A total of 176 individuals representing various natural gas production and service companies, and industry associations attended the webinars.

Industry participants recommended that EPA inventory and evaluate existing data before conducting new field investigations. Participants also recommended that EPA engage with state agencies and hydraulic fracturing (HF) technical experts to facilitate the sharing of information among stakeholder groups. Participants offered their support for technical areas of the study as well as outreach efforts. Some participants expressed concern that the study timeframe will not be long enough for the necessary data collection, analysis, and modeling. In response to participants' questions, EPA explained and clarified details of the study's scope, focus, and logistics.

The following is a summary of the EPA presentation and discussion between EPA and meeting attendees regarding the EPA Hydraulic Fracturing Study.

Scope of Study

EPA provided an overview of the proposed scope of the study:

- The proposed focus of the study will be the interactions between hydraulic fracturing and water resources. Some participants expressed concern that the study timeframe will not be long enough for the necessary data collection, analysis, and modeling.
- Participants recommended that the study consider gas-producing formations other than shale. EPA has not yet determined whether the study will focus exclusively on shale, or also on other formations.
- Participants recommended that EPA inventory and evaluate existing information at the start of the study. Participants noted that studies have already been conducted by EPA, the Ground Water Protection Council (GWPC), the Interstate Oil and Gas Compact Commission (IOGCC) and other groups. EPA will consider available data and identify data gaps before conducting field research. EPA emphasized that understanding data gaps is an important aspect of the study. EPA may conduct additional research on topics that have already been studied but that require further work.
- EPA expects a draft study plan to be completed in October 2010. The peer review will ideally be completed later in 2010 or by early 2011. Initial results will be reported by the

end of 2012. Depending on the results of the study, EPA may conduct additional work for three to five years.

- EPA staff and possibly contractors will conduct the research for the study. In addition, EPA may collaborate with universities or other outside groups through EPA's Science to Achieve Results (STAR) cooperative grants, as well as other federal agencies. Recipients of STAR grants are selected through a competitive process. EPA has not yet identified any contractors that may work on the study.
- Participants asked how EPA will define "drinking water" for the purposes of the study. EPA will use the Underground Injection Control (UIC) program's definition of an underground sources of drinking water (USDWs) (40 CFR § 144.3). USDWs are aquifers or portions of an aquifer which either supply or have a sufficient quantity of ground water to supply any public water system, currently supply drinking water for human consumption, or have a total dissolved solids (TDS) value of 10,000 mg/L or less. The definition of USDWs includes potential future sources of drinking water as well as current sources.
- EPA recognizes the importance of geophysics to the study and plans to investigate how fracturing may affect potential pathways between contaminants and drinking water sources.
- EPA received $1.9 million for the study in Fiscal Year (FY) 2010. An additional $2.5 million has been requested for FY 2011, but the final amount will be determined by Congress, and the Agency does not know the status of the study's funding after 2011. EPA will not know the specific amounts allocated to the case studies and other portions of the study until research priorities are identified.
- EPA recognizes that HF takes place at a variety of depths and involves a great number of chemicals. EPA encourages stakeholders to submit information that could inform the priorities of the study.

Ongoing Activities

- Participants described ongoing activities relevant to the study and expressed their desire to collaborate. Specific areas of research and data collection include:
    - Microseismic monitoring.
    - Environmentally-friendly drilling technologies.
    - Water quality sampling.

Case Study Selection

- The locations of the public meetings will not necessarily reflect the locations of the case studies.
- Participants asked how EPA plans to select locations for case studies, noting that HF takes place in a wide range of areas with varying geologic and environmental characteristics. EPA will strive to cover a range of geologic, geographic, and hydrologic settings with the case studies. EPA noted that collaboration with stakeholders can be important in completing the case studies.

- EPA encourages stakeholders to submit potential criteria for the selection of case study locations.

Stakeholder Process

- Participants emphasized the expertise of the states and recommended that the study take advantage of state agencies' experiences with HF.
- EPA will continue to engage the states in discussions on pathways of risk.
- EPA described the state and federal partners consultation webcasts. The state meeting had approximately 70 attendees from 21 states. Attendees included representatives from state oil and gas agencies, environmental agencies, and public health agencies. Attendees at the federal partners meeting included representatives from the Bureau of Land Management, U.S. Army Corps of Engineers, U.S. Geological Survey, U.S. Department of Energy, U.S. National Park Service, U.S. Forest Service, Centers for Disease Control and Prevention, and U.S. Fish and Wildlife Service. The slides presented at the state and federal sector meetings were very similar to the slides presented at the industry consultation. All attendees looked forward to opportunities for collaboration with the other sectors.
- A participant noted that the World Shale Gas Conference will be held in Dallas, Texas, on November 2 to 5, 2010. EPA may investigate this event as a potential site for a technical workshop.
- Participants inquired about the opportunities for industry and other technical experts to participate in the technical workshops. EPA expects there will be opportunities for industry experts to assist with technical workshops. EPA will develop agendas for the workshops and solicit input from various stakeholders. Participants noted that industry experts could address EPA's knowledge gaps in petroleum engineering and other technical areas of HF.
- EPA will strive to consider and use public comments to the greatest extent possible, and consider opinions and experiences in addition to data and results. Verbal comments will be limited to two minutes, and EPA expects that many participants at the public meetings will present the highlights of their comments and submit more detailed information in writing. EPA will accept written comments online at hydraulic.fracturing@epa.gov.
- Participants recommended that EPA ensure that verbal comments at the public meetings represent a range of perspectives.
- The public meetings are scheduled to be four hours long. The meetings will begin with brief presentations on proposed ideas for the study. EPA will pose questions to the audience on the study design and criteria for site selection. Verbal comments will have a two-minute time limit.
- Participants asked if there will be invited speakers at the public meetings. EPA noted that there will be no invited speakers, and anyone who wishes to comment may do so, within the time constraints. Individuals who wish to provide verbal comments can preregister online at http://hfmeeting.cadmusweb.com. The Agency does not plan to share a full list of registered attendees prior to the meetings.

- Participants asked about EPA's strategy for selecting public meeting locations. EPA selected the locations for the public meetings based on EPA Regional input in areas where the most extensive hydraulic fracturing activities are taking place.
- EPA is currently discussing options for the peer review of the study plan. Regardless of the process that is selected, EPA expects experts from a variety of technical areas to participate in the peer review process.
- The public will also have opportunities to provide input. Public input may be solicited prior to the peer review, to focus the reviewers' attention, or it may be solicited after the peer review is complete. Participants noted that public input could bring the reviewers' attention to issues they may be unfamiliar with.
- The technical workshops and the STAR grants may be ways for EPA to incorporate the experience of HF experts into the study.
- EPA Region 2, Region 3, Region 6, and Region 8 are key players in the study at this time.

Ongoing and Existing Research

- Attendees suggested EPA take advantage of available microseismic data that directly diagnose fracture orientation and length. EPA is aware of this type of data and hopes to incorporate it into the study.
- EPA requested that stakeholders submit any data or reports that they are aware of to EPA. EPA will work to locate any data sets or studies brought to their attention by stakeholders.
- Participants asked how EPA will handle proprietary information. Data submitted to EPA will be received and processed by staff who are cleared to handle confidential business information (CBI). EPA will follow Agency policies with regard to CBI and will follow up with industry representatives to discuss the appropriate treatment of CBI in the study. EPA hopes to identify approaches that will allow the most effective use of data while protecting companies' information.
- EPA may use a database and contractor support to compile submitted data into a useable format. Data may be submitted directly to Rebecca Foster (foster.rebecca@epa.gov). EPA requested that submissions include the software/program and edition used to submit the data so EPA is better able to analyze the submitted data.
- EPA will apply Agency data quality standards to data used in the study. However, EPA will consider any data submitted, regardless of quality. EPA requested that submissions include a description of any quality assurance/quality control (QA/QC) procedures that have been applied to the data.

Industry Represented at Consultation

Affiliation
AIPRO
American Association of Blacks in Energy
American Gas Association
Anadarko Petroleum Corp.
Anadarko Petroleum Corp.
Apache Corporation
API
ARCADIS
AREVA
Argonne National Laboratory
Ashland Inc.
Badger Mining Corporation
BAE Systems
Baker Botts, for Halliburton
Basic Energy Services
Benson-Montin-Greer
Betty & Wozniak
Bill Barrett Corporation
Bismarck-Mandan Chamber
BJ Services
Black Diamond Minerals LLC
Black Hills Corporation
Black Hills Energy
Black Hills Exploration and Production
BP
BrownFlynn
Burleson Cook LLP
CenterPoint Energy Gas Transmission Company
CF Industries
Chesapeake Energy
Chevron
Colorado Oil & Gas Association
Colorado Oil & Gas Conservation Commission
ConocoPhillips
Consumer Energy Alliance
DCLRS
Delta Consultants

Affiliation
Devon Energy Corporation
Dugan Production Corp.
Dupont
El Paso Corporation
EnCana Oil & Gas
EOG Resources
EQT Corporation
EXCO Resources
ExxonMobil
FTN Associates Ltd.
Gas Technology Institute
General Electric
GolinHarris
Halliburton
Hart Resource Technologies, Inc.
Houston Advanced Research Center
Independent Petroleum Association of America
Industrial Minerals Association
K&L Gates
K.P. Kauffman Co.
Koch Exploration Company
KP Kauffman Company
Linn Energy
Lotus LLC
Louisiana Oil & Gas Association
Marcellus Shale Coalition
M-I SWACO
Natural Gas Supply Association
New Mexico Oil & Gas Association
NiSource
Noble Energy, Inc.
Occidental Oil and Gas
Oklahoma Independent Petroleum Association
Panther Energy
Pennsylvania Farm Bureau
Perkins & Trotter LLC
Pioneer Natural Resources Inc.
QEP Resources, Inc.
Range Resources

Affiliation
Red Willow Production Company
Santrol
SeaJay Environmental LLC
Sepco
Shell
Sil Industrial Minerals
Southwestern Energy
Spectra Energy
State of Oklahoma
Swift Oil & Gas
Targa Resources, Inc.
Tetra Tech
Texas Oil and Gas Association
Texas Railroad Commission
The Dow Chemical Company
The Leadership Institute
The Livingston Group
TIPRO
U.S. Chamber of Commerce
U.S. Silica Company
Unimin Corporation
Unimin Corporation
Weatherford International
West Slope Colorado Oil & Gas Association
Williams
Wyo-Ben, Inc.
XTO Energy
Yates Petroleum Corp.