EPA State and Tribal Partner Webinar on Hydraulic Fracturing Using Diesel Fuels
Monday, May 9, 2011

Meeting Summary

Webinar Purpose

The purpose of the webinar was to engage in outreach with EPA's state and tribal partners on approaches that the Underground Injection Control program may use to develop guidance for permitting the use of diesel in hydraulic fracturing for oil and natural gas extraction. Hydraulic fracturing using diesel fuels is considered a Class II injection activity.

EPA presented background on the Underground Injection Control program and an overview of the guidance approaches. The presentations were followed by a question and answer session in which stakeholders were invited to comment and proposed additional approaches to permitting hydraulic fracturing using diesel fuels. Questions posed by EPA to stakeholders included the following:

- What should be considered as "diesel fuels"?
- What are important siting considerations?
- What suggestions do you have for reviewing the area around the well to ensure there are no conduits for fluid migration?
- What should the permit duration be, considering the intermittent nature of hydraulic fracturing and Class II plugging and abandonment provisions?
- What well construction requirements should apply to hydraulic fracturing wells using diesel fuels?
- What well operation and mechanical integrity requirements should apply to hydraulic fracturing wells using diesel fuels?
- What well monitoring and reporting requirements should apply to hydraulic fracturing wells using diesel fuels?
- What information should be submitted with the permit application?
- What should the time frame be for submitting a Class II diesel fuels hydraulic fracturing permit?
- What are alternatives for authorizing/permitting Class II wells using diesel fuels for hydraulic fracturing?
- How do the Class II financial responsibility requirements apply to wells using diesel fuels for hydraulic fracturing?
- What public notification requirements or special environmental justice considerations should be considered for authorization of wells using diesel fuels for hydraulic fracturing?

Introductory Presentations

Bruce Kobelski (Acting Chief, Drinking Water Protection Division – Prevention Branch, EPA) presented basic information on EPA's Underground Injection Control Program, outlining the history and purpose of the program. Under the Safe Drinking Water Act, the Underground

Injection Control Program is mandated to prevent the contamination of underground sources of drinking water through migration from injection wells. The presenter described the six well classes, including the new Class VI for geologic sequestration of carbon dioxide. The technical requirements of the Underground Injection Control Program fall into several broad categories, including site characterization, area of review, well construction, operation and monitoring, mechanical integrity testing, and well plugging and closure. All injection must be authorized by a permitting agency. Forty states and two tribes have primary enforcement responsibility (primacy) for all or some Underground Injection Control well classes, while other programs are under direct implementation by EPA.

Ann Codrington (Acting Director, Drinking Water Protection Division, EPA) outlined EPA's mandate to create a permitting guidance for hydraulic fracturing using diesel fuels. While most hydraulic fracturing activities are excluded from the Safe Drinking Water Act under the Energy Policy Act of 2005, hydraulic fracturing using diesel fuels is not and is subject to Safe Drinking Water Act requirements. The guidance aims to clarify existing Underground Injection Control Class II regulations, providing recommendations for permit writers so that permitting of hydraulic fracturing activities using diesel fuels provides the required protection of underground sources of drinking water.

Discussion Following the Introductory Presentations

In response to participant questions about the creation of the guidance, EPA emphasized that the Underground Injection Control Program is a prevention program. Because from the Safe Drinking Water Act uses a broad definition for underground sources of drinking water, there are very few areas of the United States without underground sources of drinking water, and therefore EPA has authority under from the Safe Drinking Water Act to regulate injection operations across the country. EPA is developing this guidance to facilitate the writing of effective permits as well as inform owners and operators as they apply for permits. Preliminary results from the concurrent EPA study on the environmental impacts of hydraulic fracturing on underground sources of drinking water will not be available until late 2012, and hydraulic fracturing activities using diesel fuels will require permits before that time.

In response to participant questions about the use of diesel fuels in hydraulic fracturing, EPA clarified that diesel fuels are viscosifiers, act as solvents, and effectively carry proppant and other material into the formation. Diesel-range organics can also be components of other chemical additives. EPA is seeking input from participants on the definition of "diesel fuels" that should be used in the guidance.

Webinar Discussion Summary

The statements made during this discussion do not represent the views or opinions of EPA. The claims made by participants have not been verified or endorsed by EPA.

What should be considered as "diesel fuels"?

- EPA clarified that hydraulic fracturing, per the decisions of the Legal Environmental Assistance Foundation (LEAF) cases, is classified as a Underground Injection Control Class II activity and fits in the sub-class of enhanced recovery wells. State participants discussed whether Class II enhanced recovery wells are injection or production wells.
- State participants suggested several possible approaches for defining diesel fuels for the purposes of the guidance:
    1. Define diesel fuels according to Chemical Abstracts Service numbers.
    2. Set a threshold or minimum amount of diesel fuels that must be present for a permit to be necessary.
    3. Define diesel fuels as the sum total of all diesel components in the fracture fluid.
    4. Require a permit when any amount of diesel fuels is used (whether as carrier fluid or part of a chemical formulation).
- One participant expressed concern that using the ASTM International (originally known as the American Society for Testing and Materials) standard or Chemical Abstract Service numbers may not cover biofuels.

What are important siting considerations?

- Some state participants suggested that EPA specify a minimum protective vertical distance below the lowermost underground sources of drinking water. Some state participants also agreed with the first three considerations included on the slide for this discussion question: determining the integrity of the confining layers around the injection zone, determining the integrity of the injection zone, and identifying existing fault or fracture patterns in the project area. One participant raised the objection that requiring identification of existing faults or fractures is impractical due to the short-term nature of hydraulic fracturing activities. The participant noted that operators gather data on the length and axes of fractures while running geophysical logs during the fracturing event.
- One participant suggested a tiered set of requirements based on varying levels of risk at different zones in the subsurface.
- A participant suggested that a performance-based approach could be effective, especially under from the Safe Drinking Water Act section1425 programs.
- A participant suggested that siting considerations be limited to coalbed methane formations, which were the subject of the LEAF litigation. The participant suggested that siting considerations are not applicable in other formation types.

What suggestions do you have for reviewing the area around the well to ensure there are no conduits for fluid migration?

- Some participants mentioned that service companies already implement practices that are useful for determining the area of review, such as calculations that look at the extent of fractures. The participants noted that, from an economic standpoint, the operators must site wells and laterals so that the fractures do not intersect with fractures or laterals from another well.
- State production regulations often include requirements regarding the location of aquifers and water well depths. Some participants suggested that this is unnecessary for hydraulic fracturing operations because hydraulic fracturing generally occurs hundreds or thousands of feet below underground sources of drinking water.
- A participant suggested that the tiered approach based on potential risk to underground sources of drinking water mentioned in response to the previous question could also be applied to reviewing the area of review.
- Some participants mentioned that an important consideration would be whether the well to be fractured is within a source protection zone.

<u>What should the permit duration be, considering the intermittent nature of hydraulic fracturing and Class II plugging and abandonment provisions?</u>

- Several participants stated that the role of the Underground Injection Control Program ends when a well is put into production and clarified that they see hydraulic fracturing activities as temporary injection activities occurring in production wells.
- Specific suggestions provided by the participants included:
    1. Permit by rule could cover hydraulic fracturing with the term of coverage being the duration of each separate fracturing activity. In this case, EPA would rely on the state's plugging and abandonment requirements for completed production wells.
    2. A single permit for hydraulic fracturing activities using diesel fuels could be issued to cover the life of the well, with the well entering a "temporary abandonment" state when it is in production.
    3. Permits issued for the life of the well could be reviewed every five years.

<u>What well construction requirements should apply to hydraulic fracturing using diesel fuels?</u>

- Participants suggested that construction, siting, and plugging of wells that undergo hydraulic fracturing using diesel fuels should be regulated by existing state production well requirements.
- EPA expressed concern that different states have different requirements; because of this, it could be difficult to determine whether existing requirements are effective at preventing endangerment of underground sources of drinking water during hydraulic fracturing.

<u>What well operation and mechanical integrity requirements should apply to hydraulic fracturing wells using diesel fuels?</u>

- A participant noted that Oklahoma requires pressure testing of the surface casing. Another participant noted that Colorado requires operators to continuously monitor and record the bradenhead annulus pressure during stimulation activities, and to promptly report pressure increases of more than 200 pound-force per square inch gauge (psig).
- A participant explained that in Utah, wells (injection and producing) within source protection zones are considered potential contamination sources and operators must work with water systems to ensure protection of underground sources of drinking water.
- A participant suggested that mechanical integrity testing take place only before (not after) each hydraulic fracturing event. The participant clarified that the operator has an economic incentive to ensure that the casing has integrity once production begins (after hydraulic fracturing activity is complete) so the additional testing is not required.

What monitoring and reporting requirements should apply to wells that are hydraulically fractured using diesel fuels?

- A participant suggested that monthly monitoring is not an appropriate monitoring frequency.
- Participants discussed the issue of baseline monitoring. Some said that it is not a requirement under Class II and therefore should not be a requirement for hydraulic fracturing using diesel fuels. Others said that since EPA is mandated to protect underground sources of drinking water regardless of whether diesel is used, requiring baseline monitoring is appropriate and would be in keeping with requirements under other programs.
- In response to a question on monitoring the composition of injected fluids, EPA clarified that the Underground Injection Control Program Director has the discretion to ask for additional information during the permitting process and could require information on other contaminants of concern in addition to diesel.

What information should be submitted with the permit application?

- A participant suggested that all public water supply wells within the area of review be included in the permit application. The participant recommended that surface activities associated with hydraulic fracturing also be considered.
- A participant mentioned that, depending on the scope of the definition of diesel and the minimum requirements in the guidance, reviewing all of the required information for all wells within a state may not be covered by existing resources.

What should the time frame be for submitting a Class II permit for hydraulic fracturing using diesel fuels?

- Some state participants suggested the permits be submitted a minimum of 90 days before the activity is scheduled to take place. Other states suggested that the guidance include no minimum time frame, due to variations in state public notification requirements.
- Several participants stated that flexibility is best because states will need to integrate permitting for this activity with the permitting that they do for production wells.

- Participants also expressed a concern for preserving a quick turnaround time for permits that fulfill all requirements.

What are alternatives for authorizing/permitting Class II wells using diesel fuels for hydraulic fracturing?

- Participants suggested the use of area permits for all operators in a field, combined with field hearings that would establish additional criteria and requirements in the field. A participant noted that field hearings are common in oil and gas states and are associated with permit by rule.

How do the Class II financial responsibility requirements apply to wells using diesel fuels for hydraulic fracturing?

- Participants did not provide any recommendations for this topic.

What public notification requirements or special environmental justice considerations should be considered for authorization of wells using diesel fuels for hydraulic fracturing?

- State participants reported having 15-day and 20-day public notification periods for Class II injection wells. One state provides a notice of state adoption of the permit by rule for a field.
- Some participants suggested that notification to state drinking water programs and public water systems in the area of review may be necessary.
- A participant stated that the location of producing wells is dependent on the location of the resource, so environmental justice considerations are not applicable.
- A participant suggested that additional requirements might result in a de facto ban on the use of diesel fuels in hydraulic fracturing.

Webinar Attendance

The webinar was attended by individuals representing EPA Headquarters and regional offices, associations, tribal and state Underground Injection Control programs, and state programs regulating oil and gas production. Organizations represented include the following:

Alabama Department of Environmental Management
Arkansas Department of Health
Association of State Drinking Water Administrators
Colorado Department of Public Health and Environment
Colorado Oil and Gas Conservation Commission
EPA Headquarters, Washington, DC
EPA Region 3, Philadelphia, PA
EPA Region 5, Chicago, IL
EPA Region 7, Kansas City, MO
EPA Region 8, Denver, CO
Fort Peck Tribes

Ground Water Protection Council
Interstate Oil & Gas Compact Commission
Kansas Corporation Commission
Michigan Department of Environmental Quality
Nebraska Oil and Gas Conservation Commission
New Jersey Department of Environmental Protection
New York State Department of Environmental Conservation
North Dakota Industrial Commission
Oklahoma Corporation Commission
Oklahoma Department of Environmental Quality
Pennsylvania Department of Environmental Protection
Railroad Commission of Texas
State Oil and Gas Board of Alabama
Utah Department of Environmental Quality
Wyoming Oil and Gas Conservation Commission