EPA Federal Partner Webinar on Hydraulic Fracturing Using Diesel Fuels
Tuesday, May 10, 2011

Meeting Summary

Webinar Purpose

The purpose of the webinar was to engage in outreach with EPA's federal 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 (referred to as Underground Injection Control 101) 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. 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 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. One participant asked about the frequency of diesel fuel use in hydraulic fracturing. EPA clarified that the Agency is hoping to collect this information through the current study on hydraulic fracturing and through input from stakeholders. EPA noted that it can be difficult to obtain estimates of diesel use due to differing definitions of "diesel fuels" among industry and other stakeholders. EPA is seeking input from participants on the definition of "diesel fuels" that should be used in the guidance. A participant suggested that hydraulic fracturing wells be required to meet or exceed the Class II construction and monitoring requirements, thereby ensuring that all hydraulic fracturing wells are protective of underground sources of drinking water regardless of use of diesel fuels.

In response to a participant question about injection pressures associated with hydraulic fracturing activities, EPA clarified that 40 CFR Part 146 provides a performance-based standard that operating pressures cannot propagate existing or new fractures within the subsurface which could provide conduits for fluid movement into underground sources of drinking water.

A participant asked whether states would need to revise their primacy packages after the guidance is issued. EPA clarified that some states may not need to revise their primacy packages but that others, especially states that currently exclude hydraulic fracturing from underground injection, may need to make revisions.

In response to a participant question about the timing of the guidance, EPA clarified that the guidance is being developed 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 USDWs will not be available until 2012, and hydraulic fracturing activities using diesel fuels will require permits before that time.

Webinar Discussion Summary

<u>What should be considered as "diesel fuels"?</u>

- Federal participants suggested several possible approaches for defining diesel fuels for the purposes of the guidance:
    1. Define diesel fuels as compounds having a certain upper or lower boiling point as used in distillation processes.
    2. Use a broad definition to include all hydrocarbon-based components of the fracture fluid.
- A participant voiced concern that a narrow definition of diesel fuels could make it economical to design fracture fluid components that are hydrocarbon-based but fall outside of the permit requirement for hydraulic fracturing using diesel fuels.
- EPA noted that state stakeholders saw a potential increase in burden associated with additional permits as a result of a broader definition of diesel fuels.

<u>What are important siting considerations?</u>

- Some federal participants expressed approval of the first three points on EPA's slide for this discussion question, including determining the integrity of the confining layers, determining the integrity of the injection zone, and evaluating the project area to identify existing fault or fracture patterns. A participant suggested adding consideration of the fracture gradient of the confining zone.
- A participant suggested that a performance-based approach may be appropriate, and that the first three points could be used for compliance with a performance-based approach. A participant noted that monitoring would be a key component of a performance-based approach.
- A participant suggested that siting considerations should focus on surface siting issues, rather than the subsurface. Another participant noted that nearby abandoned wells could blow out in the subsurface during fracturing activities and suggested microseismic monitoring to ensure that fracturing does not extend beyond the fracture zone.
- A participant noted that post-hydraulic fracturing monitoring is important.

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

- Federal participants commented that some Regions use a modified version of the fixed one-quarter mile radius for the area of review that takes into account the lateral extent of wells that use horizontal drilling. In these cases, the area of review is ellipse-shaped rather than circular.
- A participant commented that determining the zone of influence should work equally well for both horizontal and vertical wells.

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

- Some federal participants suggested that permits for hydraulic fracturing cover the life of the well but allow the well to become inactive or temporarily abandoned during production phases. The participants noted that it would be burdensome to repermit wells for every fracture event during the life of the well. A participant suggested that the Underground Injection Control reporting and monitoring requirements could be suspended during the production phases when, under the permit for hydraulic fracturing, the well is not considered active. The owners or operators of wells would need to obtain approval for restimulation but would not need to repermit.
- Other participants noted that the Underground Injection Control Program requires that demonstration of financial responsibility be continued for the life of the permit, and commented on this burden. The participants suggested that wells be repermitted for each hydraulic fracturing event, noting that a six-month permit could allow a sufficient length after fracturing to determine that underground sources of drinking water have not been impacted by that activity.
- Some federal participants suggested a sliding scale for permit duration based on the potential threat to underground sources of drinking water.

What well construction requirements should apply to hydraulic fracturing wells using diesel fuels?

- A participant commented that many state production regulations require cementing through the base of the lowermost underground source of drinking water. Federal participants suggested that the guidance include a definition of this limit that allows for site-specificity and noted that some state regulations (e.g., Pennsylvania) may be appropriate as examples. A participant suggested mud logging as a method for determining the necessary depth.
- A participant suggested that the casing be completed through the base of the lowermost USDW and into the underlying formation. Another participant suggested a cement bond log to verify good bonding between the casing and the formation.
- A participant noted that some deep wells require staged cementing as opposed to a continuous seal due to circulation issues. Federal participants noted that EPA should keep this in mind when addressing well construction in the guidance.

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

- Federal participants noted that blowout preventers provide a false sense of security and their use should be left to the discretion of state permit writers.
- A participant suggested periodic testing of all equipment, citing ultrasonic testing as a possibility. The participant suggested that EPA contact service companies such as Schlumberger to determine how companies are testing their equipment and with what frequency.

- A participant commented that existing wells should meet mechanical integrity testing requirements that there is no significant leak in the casing, tubing, or packer, and that there is no significant fluid movement into underground sources of drinking water through vertical channels adjacent to the injection well bore. The participant noted that a cement bond log should be run where practical to ensure the second mechanical integrity testing requirement.
- Federal participants noted that requiring mechanical integrity testing every five years could prove onerous to operators who may object to the interference of Underground Injection Control requirements with the production process. A participant suggested that mechanical integrity testing be required a set period of time after the fracture process instead of every five years.

<u>What monitoring and reporting requirements should apply to hydraulic fracturing wells using diesel fuels?</u>

- Federal participants suggested that baseline sampling of underground sources of drinking water may be appropriate.
- EPA noted that within Underground Injection Control regulations, the Director has the discretion to collect any additional information they may feel is necessary. EPA also noted that financial responsibility requirements in the regulations do not cover remediation if a public supply well is harmed.
- A participant noted that some states may allow operators to determine whether to conduct baseline monitoring. The participant explained that this may be coupled with a liability approach which assumes that any contamination of underground sources of drinking water within a set distance results from well operations.
- A participant noted that the American Petroleum Institute may have recommended that operators conduct baseline sampling for hydraulic fracturing.

<u>What information should be submitted with the permit application?</u>

- Participants did not provide any recommendations for this topic.

<u>What should the time frame be for submitting a Class II hydraulic fracturing diesel fuels permit?</u>

- Federal participants commented that state production regulations often include a 30-day public notification requirement. A participant commented that some states may also require notification to landowners located near a well site.
- A participant suggested that the time frame for reviewing a permit could be a minimum of 30 days. EPA noted that some states review permits in a matter of days and want to maintain the flexibility.

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

- Participants did not provide any recommendations for this topic.

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

- A participant suggested that bonding by lease, or by bond could apply to wells using diesel fuels for hydraulic fracturing. The participant suggested requiring the current regulatory minimum under Class II and allowing an increase up to 100% of the liability for plugging and abandonment of a well. The participant noted that under some federal programs, plugging, abandonment, and past unpaid royalties and assessments can all be bonded.

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

- Federal participants suggested a 30-day public notification period.
- A participant noted that hydraulic fracturing operations have not been routinely considered in the past in environmental impact statements prepared for federal lands.

Webinar Attendance

The webinar was attended by individuals representing EPA Headquarters and regional offices and other federal agencies. Organizations represented include the following:

EPA Headquarters, Washington, DC
EPA Region 3, Philadelphia, PA
EPA Region 5, Chicago, IL
EPA Region 7, Kansas City, KS
EPA Region 8, Denver, CO
U.S. Department of Energy
U.S. Department of Energy, National Energy Technology Laboratory
U.S. Department of the Interior, Bureau of Land Management
U.S. Department of the Interior, U.S. Geological Survey