

DEQ EXHIBIT 29



Water: Hydraulic Fracturing

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Hydraulic Fracturing Background Information

Hydraulic fracturing is a well stimulation process used to maximize the extraction of underground resources; including oil, natural gas, geothermal energy, and even water. The oil and gas industry uses hydraulic fracturing to enhance subsurface fracture systems to allow oil or natural gas to move more freely from the rock pores to production wells that bring the oil or gas to the surface.

The process of hydraulic fracturing begins with building the necessary site infrastructure including well construction. Production wells may be drilled in the vertical direction only or paired with horizontal or directional sections. Vertical well sections may be drilled hundreds to thousands of feet below the land surface and lateral sections may extend 1000 to 6000 feet away from the well.

Fluids, commonly made up of water and chemical additives, are pumped into a geologic formation at high pressure during hydraulic fracturing. When the pressure exceeds the rock strength, the fluids open or enlarge fractures that can extend several hundred feet away from the well. After the fractures are created, a propping agent is pumped into the fractures to keep them from closing when the pumping pressure is released. After fracturing is completed, the internal pressure of the geologic formation cause the injected fracturing fluids to rise to the surface where it may be stored in tanks or pits prior to disposal or recycling. Recovered fracturing fluids are referred to as flowback. Disposal options for flowback include discharge into surface water or underground injection.

Surface water discharges of the flowback are regulated by the [National Pollutant Discharge Elimination System](#) (NPDES) program, which requires flowback to be treated prior to discharge into surface water or underground injection prior to discharge. Treatment is typically performed by wastewater treatment facilities. Underground injection of flowback is regulated by either EPA [Underground Injection Control](#) (UIC) program or a state with primary UIC enforcement authority. Injection of natural gas production wastes would be considered a [Class II Injection well](#).

EPA Hydraulic Fracturing of Coalbed Methane Reservoirs Study (2004)

Prior to 1997, EPA considered hydraulic fracturing to be a well stimulation technique associated with production and therefore not subject to UIC. The Legal Environmental Assistance Foundation (LEAF) challenged EPA's opinion on hydraulic fracturing regulation in 1994, and the 11th Circuit Court of Appeals ruled that hydraulic fracturing of coalbed methane wells was indeed subject to the SDWA and UIC regulations under Alabama's UIC program in 1997.

EPA began a study on hydraulic fracturing used in coalbed methane reservoirs in 1999 to evaluate the potential risks to USDWs. The study focused on coalbed methane reservoirs because they are typically closer to the surface and in greater proximity to USDWs compared to conventional gas reservoirs. EPA published the coalbed methane study, entitled [Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs](#) (EPA 816-R-04-003) in 2004. The published study received both internal and external peer review, and public comment on study design and incident information. EPA concluded that there was little to no risk of fracturing fluid contaminating underground sources of drinking water during hydraulic fracturing of coalbed methane production wells. EPA retained the right, however, to conduct additional studies in the future. As a precautionary measure, the Agency also entered into a [Memorandum of Agreement in 2003 \(PDF\)](#) (9 pp., 331 K, [about PDF](#)) with companies that conduct hydraulic fracturing of CBM wells to eliminate use of diesel fuel in fracturing fluids.

- [Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs Study \(2004\)](#)

The 2005 Energy Policy Act amended the SDWA definition of "underground injection" to exclude underground injection of fluids or propping agents, other than diesel fuels, in hydraulic fracturing activities related to oil, gas, or geothermal production activities.

- [Natural Gas Extraction and Hydraulic Fracturing](#)

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