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To: Colorado Oil and Gas Conservation Commissioners

From: Colorado Oil and Gas Conservation Commission Staff

Dated: February 18, 2011

Re: Use of Diesel Fuel for Hydraulic Fracturing in Colorado

This memorandum reports on our investigation to date into the use of diesel fuel for hydraulic fracturing in Colorado.

On January 31, 2011, the House of Representatives Committee on Energy and Commerce notified the Environmental Protection Agency that 12 oil and gas service companies had used about 32.2 million gallons of diesel fuel or fluids containing diesel fuel for hydraulic fracturing during the period from 2005 through 2009 and that about 1.3 million gallons of such fuel or fluids had been used in Colorado. The Committee further reported that these companies had not obtained permits under the Safe Drinking Water Act authorizing the injection of diesel fuel. The Committee stated that it could not determine whether these activities had adversely affected drinking water supplies because it lacked the information to do so.

We are currently reviewing our records to investigate the use of diesel fuel for hydraulic fracturing in Colorado. Our regulations do not require operators to report the constituents of their fracturing fluids unless requested under Rule 205. Rule 308B, however, requires operators to submit a Completed Interval Report, Form 5A, within 30 days after completing a formation. These reports include summary information on the formation treatment, which may include hydraulic fracturing as well as certain types of well maintenance. In their summaries, some operators have reported the use of diesel alone or in combination with other substances. The staff's review of these reports is ongoing, but reports for 65 wells refer to the use of diesel for formation treatments generally. Five of these wells were treated in the 1950s, thirteen in the 1960s, six in the 1970s, twenty-nine in the 1980s, four in the 1990s, seven in the 2000s, and one in 2010. The treatment in 2010 did not involve hydraulic fracturing. None of the treatments involved wells completed in coal bed methane formations, which are generally shallower and therefore might pose a greater risk to drinking water.

With respect to the period from 2005 through 2009 that the Committee investigated, the reports indicate that diesel fuel or fluids containing diesel fuel were used to hydraulically fracture or otherwise treat four wells: two in 2005, and two in 2007. By way of comparison, our records indicate that more than 10,000 wells were hydraulically fractured during this period. However, we emphasize that many operators did not include fracturing fluid

constituents in their completed interval reports because they were not required to do so; therefore, the reports do not provide complete information on this subject as reflected in the difference in fluid volumes between the reports (66,000 gallons) and the Committee's investigation (1.3 million gallons).

To obtain additional information, we asked the Committee to provide us with the data it compiled for Colorado, but it has declined to do so because of confidentiality constraints. Therefore, we are requesting this information from the service companies and operators themselves. For this purpose, we have contacted all 13 service companies who could have provided information to the Committee regarding Colorado as well as 15 of the largest operators in Colorado. Our expectation is that the service companies will provide us with the Colorado information that they previously reported to the Committee and that the operators will provide us with additional information that we can use to verify and cross-check the information that we receive from the service companies. We have already received a number of responses, and our collection and review of this information is ongoing. This should help us to determine the extent to which diesel fuel and fluids containing diesel fuel were used for hydraulic fracturing in Colorado during the period from 2005 through 2009, including the volumes of such fluids used and when and where such use occurred.

This information should help us to assess whether this activity had any effect upon drinking water supplies by allowing us to identify and investigate nearby water wells. For some water wells, we may already have collected water quality data that addresses possible diesel contamination; for other water wells, we can seek to obtain such data at a relatively modest cost. If no diesel contamination is identified, then this would indicate that the hydraulic fracturing of the oil and gas well in question did not impact drinking water supplies. If diesel contamination is identified, then this could indicate that hydraulic fracturing of the oil and gas well did impact drinking water supplies and we can seek remediation of such contamination and take further action to ensure that it does not recur. It is important to remember that we have previously investigated numerous complaints alleging impacts to water wells and ground water resources from hydraulic fracturing and other oil and gas operations. Staff believes that if such impacts had occurred, whether due to the use of diesel fuel or other substances, then they would have been identified during our investigations.

As a general matter, we believe that the Commission's regulations should have prevented the contamination of drinking water supplies from the use of diesel fuel or other substances for hydraulic fracturing in Colorado. The fracturing fluids would have been injected into hydrocarbon-bearing formations at depths that often approach 8,000 feet or more, while most drinking water supplies are less than 1,000 feet deep. Rule 317 required the wells to be cased with steel pipe and the casing to be cemented to create a hydraulic seal. This should have ensured that any fluids or hydrocarbons flowing back up the well bore did not come into contact with the shallower aquifers. Other regulations and Commission orders imposed further operational and monitoring requirements, and the 2008 rulemaking mandated additional protections, including cement bond logs, bradenhead monitoring, public water system setbacks, and water well sampling.

After consulting with the Attorney General's Office, we also believe that the mere use of diesel fuel for hydraulic fracturing, in and of itself, would not have violated our regulations. Although Rule 325 required persons to obtain an underground injection formation permit before constructing or operating a Class II well for the underground disposal of fluids, the Commission staff did not construe this requirement to apply to hydraulic fracturing. Nor did the Environmental Protection Agency, which administers the Safe Drinking Water Act, advise the Commission that it should require such a permit for hydraulic fracturing involving diesel fuel. A violation of Rule 324A would, however, have occurred if this activity resulted in a significant adverse environmental impact to water, soil, or biological resources.