An Overview of Trends within Hydraulic Fracturing in Louisiana with a Focus on Haynesville Gas Play

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GCAGS Explore & Discover Article #00311*
http://www.gcags.org/exploreanddiscover/2018/00311_carlson.pdf
Posted September 29, 2018.

*Article based on an abstract published in the *GCAGS Transactions* (see footnote reference below) and delivered as an oral presentation at the 68th Annual GCAGS Convention and 65th Annual GCSSEPM Meeting in Shreveport, Louisiana, September 30–October 2, 2018.

ABSTRACT

For 70 years, hydraulic fracturing has occurred but only in the last decade has it come to public attention due to the massive amounts of water used for development of unconventional hydrocarbon deposits as a result of long horizontal holes. There are few general studies that have considered the volumes of water used and the chemistry of fracturing water throughout the United States. In these studies, time periods considered are broad, decades. For this study, hydraulic fracturing trends are considered on a year-by-year basis primarily for the Haynesville Shale Gas Play (HSGP) but also for a few other units in Louisiana.

Data from two sources have been analyzed: (1) The Louisiana Department of Natural Resources data of volumes of water used, source type, and source location; and (2) FracFocus who have data for the chemistry of water used within the fracturing solution. Their chemical data, including maximum concentrations, is split up by components of fracking by reason of use, such as: acid, acid/corrosion inhibitor, biocide, base carrier fluid (water), breaker, clay and shale stabilization control, cross-linker, friction reducer, gel, iron control, non-emulsifier, pH adjusting agent/buffer, propping agent, scale inhibitor, and surfactant. Often, 10 to 20 different chemicals are used in addition to water and sand for each hydraulic fracturing job, but many of these are not identified for economic reasons. Within the HSGP, there are over 100 different compounds used in fracking solutions. However, for this study focus is on the thirty most commonly used compounds.

Throughout the past decade, the median volume of water used for hydraulic fracturing has increased. The source of that water is nearly always surface waters, generally a nearby natural or artificial pond. Regional sources, such as the Red River, are usually less than 25% of sources by year. Contractors response to general agreements between LA DNR and frackers to use fewer groundwater sources by moving frack water demand from groundwater to local small ponds, indirect withdrawals of local groundwater.

In the past six years, the chemistry of fracture solutions has changed. Concentrations of hazardous compounds, such as methanol, naphthalene, or light/heavy petroleum distillates, are decreasing. By contrast, concentrations of more benign compounds, such

Originally published as: Carlson, D., 2018, An overview of trends within hydraulic fracturing in Louisiana with a focus on Haynesville Gas Play: Gulf Coast Association of Geological Societies Transactions, v. 68, p. 675.