

OIL WELL REFRACTURING STUDY - BACKGROUND MEMORANDUM

STUDY OVERVIEW

The 2017 Legislative Assembly approved House Concurrent Resolution No. 3027 ([Appendix A](#)), which provides for a Legislative Management study of a study of the refracturing of existing oil wells. The study must include consideration of the estimated fiscal impact to refracture existing wells along with the estimated costs and benefits related to tax collections and any potential tax incentives for refracturing existing oil wells.

PRIOR STUDIES RELATED TO ENHANCED OIL RECOVERY Energy Development and Transmission Committee

During the 2015-16 interim, the Energy Development and Transmission Committee received information regarding enhanced oil recovery as a part of its study of the oil and gas tax allocation formulas. Under current techniques, approximately 3 to 10 percent of the available oil can be recovered, but a small increase in the recovery percentage can result in billions of barrels of additional production according to information from the Energy and Environmental Research Center. Enhanced oil recovery with water may not be effective in North Dakota because of the geology of the Williston Basin. Enhanced oil recovery using carbon dioxide is still in the process of being tested for the Williston Basin. The length of time before oil production starts, after injecting the carbon dioxide, is unknown, but could range from a few days to a few years. The committee learned the additional oil production from enhanced oil recovery could result in an increase in oil tax collections as well as an increase in economic activity.

Taxation Committee

During the 2015-16 interim, the Taxation Committee selected IHS Energy for consulting services related to a study of oil and gas tax incentives and oil and gas recovery techniques. The final report from IHS Energy indicated enhanced oil recovery with carbon dioxide could yield 1.2 to 1.8 billion of incremental oil production in the state in the next 20 years. Direct revenues to the state from combined enhanced oil recovery activities in the Bakken Formation and in conventional fields could range from \$6.3 to \$9.7 billion. However, enhanced oil recovery with carbon dioxide is not currently economical because of technology limitations, low oil prices, and the high cost of carbon dioxide.

The Taxation Committee received information from the Department of Mineral Resources, regarding primary, secondary, and tertiary phases of oil production and various recovery methods. Currently, 95 percent of the production in the state is primary production that uses a reservoir's natural pressure for recovery. In an unconventional reservoir, such as the Bakken Formation, primary recovery methods yield approximately 3 to 5 percent of the original oil in place. Potential secondary and tertiary recovery methods water flooding, high-pressure air injection, fire flooding, rich gas injection, and carbon dioxide injection. Estimated oil yields using secondary and tertiary recovery methods are unknown; however, some preliminary conjectures suggest that the development of an enhanced recovery method that could increase recovery by 1 percent would yield 3 billion barrels of oil.

HYDRAULIC FRACTURING PROCESS

The process to fracture a well begins after the oil well has been drilled and lined with casing. The Environmental Protection Agency describes hydraulic fracturing as a process that produces fractures in the rock formation allowing oil and natural gas to flow into the well for extraction. The fractures are created by pumping large quantities of fluid and proppant at high pressure down the well and into the rock formation. The fluid commonly consists of water and chemical additives that open and enlarge the fractures in the rock formation. Proppants include sand, ceramic pellets, or other small incompressible particles that hold open the fractures.

Once the injection process is complete, internal pressure of the reservoir causes the fluid, known as produced water, to return to the well. The produced water contains the chemical additives that were injected along with naturally occurring salts, metals, and hydrocarbons. The produced water is usually injected underground in a disposal well, but may also be treated in as part of a recycling process. With the hydraulic fracturing process is complete, oil and natural gas flow into the well and for extraction at the wellhead located at the surface.

TAX INCENTIVES RELATED TO ENHANCED OIL RECOVERY

When the oil and natural gas are extracted, they are subject to the oil and gas gross production tax and the oil extraction tax. Materials used in the construction of the well, the hydraulic fracturing process, and the extraction of the oil and gas may be subject to sales or use taxes. Pipelines and other infrastructure used to transport the oil

and gas may be subject to property taxes. However, the state provides certain tax incentives related to enhanced oil recovery to encourage the continued development of the oil industry and additional economic activity. During the 2015-16 interim, the Taxation Committee received information on the existing tax incentives associated with enhanced oil recovery, which include the following:

- Oil extraction tax exemptions for incremental production from a secondary or tertiary recovery project.
- A sales and use tax exemption for materials incorporated into specified carbon dioxide systems for use in enhanced oil recovery.
- Sales and use tax exemptions for carbon dioxide used for enhanced oil recovery.
- Property tax exemptions for pipeline property and associated transportation and storage equipment used in enhanced oil recovery with carbon dioxide.

STUDY PLAN

The following is a proposed study plan for the committee's consideration of its study of the refracturing of existing oil wells:

1. Receive information regarding the process to refracture existing oil wells.
2. Receive information regarding the estimated fiscal impact to tax collections related to the refracturing of existing oil wells.
3. Receive information regarding the estimated fiscal impact to tax collections for any potential tax incentives related to the refracturing of existing oil wells.
4. Receive testimony from interested persons regarding the study.
5. Develop recommendations and any bill drafts necessary to implement the recommendations.
6. Prepare a final report for submission to the Legislative Management.

ATTACH:1