

NORTH DAKOTA LEGISLATIVE MANAGEMENT

Minutes of the

TAXATION COMMITTEE

Tuesday, July 28, 2015
Roughrider Room, State Capitol
Bismarck, North Dakota

Senator Jessica Unruh, Chairman, called the meeting to order at 9:00 a.m.

Members present: Senators Jessica Unruh, Brad Bekkedahl, Dwight Cook, Jim Dotzenrod, David Hogue; Representatives Wesley R. Belter, Jason Dockter, Glen Froseth, Patrick R. Hatlestad, Craig Headland, Tom Kading, Jim Kasper, Jerry Kelsh, Vicky Steiner, Marie Strinden

Members absent: Senators Lonnie J. Laffen, Connie Triplett; Representative Alisa Mitskog

Others present: John Walstad, Legal Division Director, Legislative Council
See [Appendix A](#) for additional persons present.

Chairman Unruh welcomed the committee members and described the two study directives the committee is tasked with addressing this interim. She said the committee will be studying secondary and tertiary recovery methods in the Bakken Formation and surrounding fields. She said emphasis will be placed on studying the use of carbon dioxide (CO₂) for enhanced oil recovery. She said the committee will be receiving testimony from various presenters throughout the interim and securing the assistance of a consultant to aid in the committee's analysis of various enhanced recovery technologies and most suitable tax policy for the future of North Dakota oil and gas development.

Chairman Unruh called on Mr. Walstad for review of the [Supplementary Rules of Operation and Procedure of the North Dakota Legislative Management](#).

ENHANCED OIL AND GAS RECOVERY STUDY**Background**

Chairman Unruh called on Ms. Emily Thompson, Committee Counsel, for presentation of a memorandum entitled [Enhanced Oil and Gas Recovery Study - Background Memorandum](#). Committee Counsel reviewed the study directives provided in Section 4 of 2015 Senate Bill No. 2318 and Section 42 of 2015 Senate Bill No. 2015. She said the studies direct a review of the oil extraction tax exemption available for incremental production from a tertiary recovery project that uses CO₂, a review of the potential benefits to various parties of utilizing CO₂ in enhanced recovery projects, the feasibility of using CO₂ and other enhanced recovery methods in the Bakken and Three Forks Formations, the potential environmental and production benefits of using CO₂ for enhanced recovery, and the estimated fiscal impacts that may occur as a result of applying enhanced recovery methods. She provided a brief overview of the primary types of energy infrastructure present in the state and reviewed the history of the oil and gas gross production tax, the oil extraction tax, the coal severance tax, and the coal conversion tax. She reviewed recent legislation related to each tax type and summarized the findings from the most recent Legislative Management study of the future of the energy industry in North Dakota. She said the committee has \$400,000 appropriated to the Legislative Council, for use in securing the assistance of one or more consultants. She said the committee is not required to expend the full amount of the appropriation.

Representative Steiner said the name of the state's newest refinery is Dakota Prairie Refining.

Senator Cook said he reviewed the minutes of the 1951-52 interim committee responsible for developing the 1953 legislation creating the state's oil and gas gross production tax. He said it would be beneficial for the committee members to review these materials. He said the materials indicated committee members found it would be impractical to apply property tax to oil and gas so a gross production tax was developed as an alternative.

Chairman Unruh said she agreed it would be beneficial for the committee to review these materials as the committee needs to have a good understanding of where state tax policy has been before it can determine where future tax policy may be heading. She said the necessity of understanding the relevant history is part of the reason the committee members were provided such an extensive background memorandum. Chairman Unruh directed

Committee Counsel to provide committee members a copy of the materials related to actions of the 1951-52 interim committee.

A copy of the materials pertaining to the 1951-52 interim discussion of oil and gas gross production tax was distributed to the committee members following the adjournment of the meeting. A copy of these materials are on file in the Legislative Council office.

Chairman Unruh called on Committee Counsel for presentation of a document entitled [Draft Request for Proposals for Consulting Services](#). Committee Counsel explained the purpose of the request for proposals (RFP) document. She said the document contains the draft language proposed to be included in the committee's RFP for consulting services. She said the draft language outlines the topics the committee will be seeking a consultant's assistance in studying. She said the draft language provides the closing date for submission of applications, which falls on Tuesday, September 1, 2015, and the date by which a selected consultant would be required to submit a final report, which is Friday, August 19, 2016. She said the language outlines application requirements and provides for certain limitations pertaining to reimbursement rates. She said the language has been provided for the committee's review and consideration before the final language will be forwarded to the Chairman of the Legislative Management for approval. She said after the RFP is approved and posted to the Legislative Council's website, the committee members will be responsible for reviewing application materials and selecting one or more consultants for recommendation to the Chairman of the Legislative Management. She said the Chairman of the Legislative Management has final authority over the selection of one or more consultants to assist the committee.

Representative Kasper said it would be beneficial for the committee to study enhanced recovery methods in addition to enhanced recovery using CO₂ and factor those methods into the committee's review of existing, and potential future, tax policy.

Chairman Unruh said a large portion of the language included in the draft RFP was derived from the language provided within the committee's study directives.

Representative Froseth said CO₂ is currently being transported from North Dakota to Canada for use in enhanced recovery. He said it would be beneficial to contact other states that are using CO₂ for enhanced recovery, such as Wyoming, and review the pertinent legislation applied in those states. He said this information could be collected without utilizing fee-based consulting services.

Chairman Unruh said it is her intention that the committee will continue to obtain as much information as is available in conjunction with the data and analysis provided by a consultant. She said the committee's studies center around two primary areas. She said the first area entails the technological aspects of enhanced recovery to determine which recovery methods may be on the horizon for use in the Bakken and other formations. She said the second area entails an economic aspect in the committee's determination of potential impacts of future policy decisions in terms of state tax revenues and energy industry growth. She said she finds value in expending at least a portion of the available appropriation to obtain outside consulting services to provide objective information regarding the present and potential future tax policy in this state.

Senator Bekkedahl said he agreed with Representative Froseth's suggestion that information be received from states like Wyoming, especially given Wyoming's interests in coal. He said he also agreed with Chairman Unruh in that certain aspects of the study may be unique to North Dakota and that information and analysis needs to be obtained regarding potential impacts to this state's revenues, political subdivisions, and industries.

In response to a question from Representative Kasper, Chairman Unruh said she was open to the committee reviewing all methods used for enhanced oil recovery, in addition to the use of CO₂.

In response to a question from Senator Bekkedahl, Committee Counsel said there is no specific ranking or priority status assigned to one entity over another when studying the impact of current or future tax policy on the state, political subdivisions, and industry. She said the study simply directs an analysis of the impacts on these areas, as well as any other areas the committee deems relevant, during its review.

Mr. Walstad said the RFP was drafted in relatively loose terms in order to allow a consultant to operate both on the consultant's own initiative and within the terms dictated by the committee. He said the committee has the ability to fine tune which items will be explored in greater detail as the study progresses. He said the committee retains ongoing control over the direction of the study.

In response to a question from Senator Cook, Mr. Walstad provided the definition of a qualifying tertiary recovery project pursuant to North Dakota Century Code Section 57-51.1-01. He said the statutory definition provides for a

variety of recovery methods originally drawn from the federal Internal Revenue Code. He said the listed recovery methods include use of miscible fluid displacement, steam drive injection, microemulsion, in situ combustion, polymer augmented water flooding, cyclic steam injection, and various other means.

Senator Cook said the committee should take a close look at the use of CO₂ especially in consideration of some of the changes the legislature made in relation to enhanced recovery using CO₂ this past legislative session. He said it is also important to study the use CO₂ as the state produces a large amount of this substance and would benefit from finding a beneficial use for CO₂.

Chairman Unruh said the committee will be emphasizing the use of CO₂ in its study but will also be looking at all other methods of secondary and tertiary recovery that may be feasible in this state. She said the committee's review of the use of CO₂ may be particularly important in light of the upcoming federal rules expected to be finalized in August. She said the federal Environmental Protection Agency's (EPA) Clean Power Plan, established under the authority of Clean Air Act Section 111(d), will be releasing final rules in regard to mandated reductions in CO₂ emissions in August. She said the committee will be reviewing these rules in greater detail at the committee's next meeting.

Denbury Resources, Inc.

Chairman Unruh called on Mr. Matthew Dahan, Vice President - North Region, Denbury Resources, Inc. (Denbury), for presentation of information ([Appendix B](#)) regarding an overview of the company's operations, the use of CO₂ in enhanced oil recovery, an analysis of North Dakota's taxation practices in relation to the company's operations, and any plans Denbury may have for future expansion in this state. Mr. Dahan said Denbury's core business is CO₂ enhanced oil recovery. He said the company's proven and possible and probable (3P) reserves were approximately 1.2 billion barrels of oil at the end of 2014. He said the company produces very little natural gas and 95 percent of Denbury's production is oil produced from primary or secondary projects. He said Denbury was producing about 74,000 barrels per day during the first quarter of 2015 and roughly 41,000 barrels of that amount were produced as a result of CO₂ enhanced recovery operations. He said over 50 percent of the oil Denbury produces is produced using CO₂ enhanced recovery. He said at the end of 2014 the company had roughly \$8.7 billion in proved reserves. He said the company owns two CO₂ supply sources and operates over 1,100 miles of CO₂ pipelines to transport CO₂ to its fields.

Mr. Dahan reviewed a brief history of the use of CO₂ in enhanced oil recovery. He said Denbury secures CO₂ from both natural and manmade sources and transports CO₂ via pipeline at high pressure. He said the CO₂ is moved at high pressure because it is much easier to pump in a liquid state. He said any CO₂ extracted during the enhanced recovery process is recycled and reinjected. He said a portion of the injected CO₂ will remain permanently stored within the reservoir. He discussed the three stages of production within an oil field. He said during the primary production stage, oil is produced under its own natural energy and roughly 20 percent of the original oil in place will be recovered. He said during the secondary phase of recovery, water flooding is generally used and an additional 18 percent of the original oil in place will generally be recovered. He said during the tertiary or "enhanced oil recovery" phase, CO₂ is injected into the reservoir and up to an additional 18 percent of oil can be recovered resulting in a total recovery amount for all three phases of 56 percent of the original oil in place. He said injection of CO₂ allows additional oil to be recovered because, at a certain temperature and pressure, the oil and CO₂ become miscible. He said the combined oil and CO₂ swell within the reservoir and the resulting lower viscosity substance can be more easily drawn to the surface. He said enhanced recovery resurrects oil fields that may have otherwise been abandoned.

Mr. Dahan said there are 137 billion barrels of technically recoverable oil in the United States. He said approximately one-half of that number, 67 billion barrels, is economically recoverable at an oil price of \$85 per barrel. He said it is estimated the Bakken Formation contains 7.5 billion barrels of recoverable oil. He said the use of CO₂ in economically feasible recovery projects would allow for enough CO₂ storage capacity to hold the emissions produced by 93 large one gigawatt size coal-fired power plants over 30 years. He said the use of CO₂ for enhanced oil recovery provides an opportunity for storing a significant amount of CO₂. He said the CO₂ used for enhanced recovery is either naturally occurring or produced from industrial sources.

Mr. Dahan said Denbury first entered North Dakota in March 2010 with the acquisition of Encore Acquisition Company. He said the acquisition included roughly 300,000 acres of the Bakken Formation, the Cedar Creek Anticline field, the Bell Creek field in Montana, and several other smaller oil fields. He said as of December 2014 Denbury has invested roughly \$1.18 billion in North Dakota. He said the company's capital investments in 2014 amounted to \$72 million and its lease operating expenses totaled \$64 million. He said Denbury employs 41 permanent employees in this state and has an annual payroll of over \$4 million. He said \$27 million in tax has been remitted in North Dakota and nearly \$19 million in the form of royalty payments has been remitted to North Dakota residents. He said these figures are based of a gross average daily production amount of 13,000 barrels of

oil per day. He said roughly one-half of this production is derived from the Cedar Hills South field in Bowman County. He said Denbury is planning an extension to its Greencore Pipeline up to the Cedar Creek Anticline. He said Denbury is in the process of permitting that pipeline for construction. He said Denbury estimates the Cedar Creek Anticline contains roughly 260 million to 290 million barrels of recoverable oil using CO₂ enhanced recovery. He provided statistics relating to the Cedar Hills South field and said peak production obtained from this field by using CO₂ enhanced recovery would likely last for six years before production would begin to decline.

Mr. Dahan illustrated the differences between the production methods used in the Bakken Formation and the enhanced oil recovery methods employed by Denbury. He said Denbury's business model is very capital intensive. He said the majority of Denbury's capital investments are made before even one drop of oil is produced. He said it will cost roughly \$30 million to construct the 15 miles of pipeline needed to transport CO₂ to Denbury's fields in North Dakota. He said a field's existing flow lines and injection lines typically need to be replaced to handle the corrosive qualities liquefied CO₂ can take on when it is exposed to water. He said additional plants will also need to be constructed to separate CO₂ from recovered oil so it can be reinjected back into the reservoir. He said Denbury would need to invest approximately \$550 million to bring CO₂ enhanced oil recovery to North Dakota. He said operating in North Dakota is different from operating in the Gulf Coast region because all the required equipment needs to be housed in buildings due to the extreme winters. He said the length of time it takes to develop these types of projects and the intense amount of capital expenditures that are required, makes tax certainty in a state an important consideration in the company's decisionmaking process. He said Denbury currently has projects in seven different states and all of those projects compete for a limited amount of funds. He said Denbury has to consider which projects will deliver the best return on investment for its shareholders.

Mr. Andrew Springer, Tax Director, Denbury Resources, Inc., commented on the tax environment in North Dakota as compared to other states in which Denbury operates. Mr. Springer said Denbury appreciates the legislation passed during the 2015 legislative session that exempts CO₂-related expenses from sales tax. He said this recent legislation puts North Dakota on par with states like Texas and Louisiana that offer manufacturing exemptions. He said in terms of property tax, other states may have a lower rate than North Dakota, but the tax is comparable when you consider the 10-years in lieu of tax payments offered by this state. He said, in regard to severance tax and oil extraction tax, the severance tax in Texas is 4.6 percent and Texas does not have an extraction tax. He said Texas also offers a 50 percent tax exemption on enhanced oil recovery for the first 5 years. He said Louisiana employs an interesting system where a company is not liable for any severance or extraction tax until the company yields a profit net of its operating expenses. He said in terms of modifications to North Dakota's tax system, Denbury would appreciate an extension of the exemption for a duration longer than five years.

In response to questions from Senator Bekkedahl, Mr. Dahan said Denbury does not have any production facilities utilizing a well's associated gas production to maintain reservoir pressure. Mr. Dahan said it is possible to get natural gas to be miscible with oil but that process requires the use of much higher pressure than is required for CO₂. He said one of Denbury's competitors had an air injection process in South Dakota but noted the use of air injection can be detrimental to the reservoir. He said Denbury generally requires a return on investment of over 20 percent to make a project work.

In response to a question from Senator Cook, Mr. Dahan said the length of time it takes to realize a positive return on investment varies greatly depending on the price of oil and the amount of the initial investment. He said it could take as long as five years before Denbury begins to see a positive return on its investment.

In response to questions from Representative Headland, Mr. Dahan said Denbury expects production in the Cedar Hills South field to last for approximately six years. Mr. Dahan said the length of production varies based on where the well is operated. He said Denbury's production profile is very different from what is seen in the Bakken Formation. He said in the Bakken Formation, a company will realize peak production on day one of operations and then production will begin to decline. He said Denbury's operations may take years to ramp up and then production will stay flat for five to six years and begin to taper off. He said one-half of the total amount of oil that can be recovered using enhanced recovery methods will typically be recovered after that five to six year plateau period. He said remaining oil can continue to be recovered but this recovery process spans over a long period of time. He said he is not aware of a "fourth phase" of oil recovery beyond tertiary recovery but said as long as there is oil in place there will be individuals trying to develop new ways to recover it. He said there are some projects in which the election to use one particular recovery method will preclude an operator from using a different type of recovery method in the future.

In response to a question from Senator Dotzenrod, Mr. Dahan said Denbury does not operate in any shale plays and he is not aware of any other commercial shale projects that are using CO₂.

In response to a question from Representative Kasper, Mr. Dahan said the cost of CO₂ is generally 1.3 percent of the New York Mercantile Exchange price of oil. He said transportation costs must also be factored into the cost of CO₂. He said if the price of oil is \$100 per barrel, the cost of CO₂ would be \$1.30, plus an additional dollar or more for transportation costs. He said Denbury calculates the operation's net utilization factor when analyzing the potential for a successful CO₂ enhanced recovery operation. He said the net utilization factor is a calculation of how many thousand cubic feet of CO₂ would be needed to recover one barrel of oil. He said the average project requires 9,000 to 10,000 cubic feet of CO₂ per barrel of oil recovered. He said a poor project would be one that averages upwards of 20,000 cubic feet of CO₂ to recover one barrel of oil.

In response to a question from Representative Froseth, Mr. Dahan said Denbury would pipe CO₂ into North Dakota from outside sources for use in enhanced recovery in this state. He said Denbury would consider using other sources of CO₂ as those sources became available.

In response to a question from Representative Kading, Mr. Dahan said Denbury plans to continue to bring CO₂ up to the Cedar Hills Anticline but the decision to go forward with a CO₂ enhanced recovery project in North Dakota would depend on a variety of factors. He said these factors include the price of oil, a state's tax environment, and other opportunities that may arise. Mr. Dahan invited the committee members to visit Denbury's Bell Creek facilities to get a first hand look at the company's operations.

Department of Mineral Resources

Chairman Unruh called on Mr. Lynn Helms, Director, Department of Mineral Resources, for presentation of information ([Appendix C](#)) on the various phases of oil production, the current methods utilized in oil and gas recovery, and future recovery methods that may be employed in this state. Mr. Helms said the natural pressure within an oil reservoir begins to decline on the very first day of production. He reviewed a common production decline curve showing a rapid decline at the outset of production and slowing decline as production continues. He said in a conventional reservoir, primary recovery using the reservoir's natural pressure will yield anywhere between 10 to 30 percent of the total oil in place in a reservoir. He said in an unconventional or shale reservoir like what is seen in the Bakken Formation, primary recovery will yield between 2 and 12 percent of the original oil in place. He said the only way to reach the top end of that recovery range in an unconventional reservoir is to drill a large number of wells in very close proximity. He said 95 percent of the production in North Dakota is primary production. He said only 5 percent of the oil produced in this state is produced using enhanced recovery methods. He said over the next decade or so, only 5 to 10 percent of the production in this state will be impacted by policies relating to enhanced oil production. He said in terms of tax policy, making changes only to the production related to enhanced recovery may result in large production yields without impacting any revenues derived from the state's larger share of primary production. He said the ratio of primary production to enhanced recovery production may shift over time but for the foreseeable future the scales will be tipped heavily towards primary production.

Mr. Helms explained the differences between an enhanced recovery project and a primary recovery project in terms of investment costs and production yields. He said with primary recovery, about 20 percent of all the oil that will be produced is realized within the first year and up to 30 percent of the total will be realized within the first two years. He said high investment costs associated with primary recovery operations are offset by tremendous cash flow early on. He said with CO₂ enhanced oil recovery projects, the first barrel of oil will not be realized for up to two years and peak production may not be realized for up to five years. He said this results in the operator incurring substantial costs for several years before the operator will begin to see any return on investment.

Mr. Helms described the use of water flooding in conventional reservoirs and in the Bakken Formation. He said in conventional reservoirs, water flooding serves to increase the pressure in the reservoir and can lead to the recovery of 30 to 50 percent of the original oil in place. He said there are currently 71 active water floods in North Dakota and nearly all have been formed within the last 20 years. He said the use of water flooding involves a large capital investment up front. He said costs essentially double and entail expenses relating to installing twice the number of wells, costs to acquire and transport water, and costs to pressurize and inject water into the reservoir. He said there have been three water flood projects in the Bakken Formation and all three were unsuccessful. He said the water essentially just flows through the fractures. He said in most cases, water flooding in the Bakken Formation actually caused production levels to decline.

In response to a question from Representative Froseth, Mr. Helms said the 71 water floods referenced in his handout represent 71 separate pools. He said water flooding moves oil from one unit to another so a pool must be unitized prior to water flooding to allow the individuals with water injection wells to share in the profits with individuals with producing wells. He said North Dakota allows for statutory unitization, which requires 60 percent of the owners to agree in order to unitize.

Mr. Helms described recovery using high pressure air injection. He said high pressure air injection is used in low permeability conventional reservoirs. He said it is difficult to push oil or water through reservoirs containing rocks with low permeability. He said air injection involves taking air from the atmosphere and injecting it into a reservoir at about 5,000 pounds per square inch. He said the air produces hot water and CO₂ and moves oil up out of the reservoir. He said the use of air injection requires investing in twice as many well bores as well as large air compressors. He said there are currently six active high pressure air producers in this state. He said one company using air injection discovered the use of air injection increases the well's injectivity to water, allowing the producer to eventually switch over the cheaper method of water production. He said air injection is not only more costly than water flooding, but it also introduces nitrogen into the reservoir which contaminates the reservoir's natural gas stream to the point where it can no longer be sold. He said this usually results in the natural gas being flared or vented which reduces a producer's cash flow. He said there are some real downsides to air injection but this method may be the producer's only recovery option when starting out in a very tight reservoir. He said air injection will only yield 25 to 30 percent recovery rates compared to the 30 to 50 percent recovery rates yielded using water flooding.

Mr. Helms said the only place a horizontal fire flood has ever been used was in North Dakota. He said Continental Resources, Inc., conducted the fire flood. He said the tricky maneuver was getting the fire started without blowing up all the wells in the process. He said Continental Resources, Inc., ended up purging the wells with water ahead of time and then getting the fire started out in the reservoir rather than the well bore. He said this highlights the comment made by the previous speaker that where there is oil to be had, entrepreneurs will find a way to recover it. He said when the committee is considering different incentives, it may be good to keep in mind that enhanced recovery methods require much higher up front investment costs. He said the committee may wish to receive testimony from a representative of Continental Resources, Inc., regarding the differing capital investment and operating costs involved from one project to another.

In response to a question from Senator Bekkedahl, Mr. Helms said oil recovery using rich gas injection is practiced in Alaska. He said almost as much oil can be recovered by injecting produced gas back into a well as can be recovered by injecting CO₂. He said at one point there were two projects using this type of recovery method in North Dakota. He said both projects are currently inactive because the company found a cheaper way to recover the oil. He said the Department of Mineral Resources has approved one permit for a company to test rich gas injection in the Bakken Formation. He said the company was able to develop a rich gas mixture that functions like CO₂. He said the project is set to commence this summer and will be the best field test available to determine whether CO₂ injection would be a feasible recovery method in the Bakken Formation. He said producers are currently flaring 18 percent of all the gas that is produced in the Bakken Formation. He said taxation related to this method of enhanced oil recovery is something the Tax Department has wrestled with. He said it becomes a question of whether natural gas is taxed on a "first in first out" basis or if the company should receive a tax break on the natural gas being injected into the reservoir. He said if the committee decides to incentivize this type of recovery method it may need to determine whether the producer will be paying tax on the natural gas upfront, thus excusing tax liability for gas recovered later as that gas will be considered to be the gas that was injected, or if some other taxation structure would be more appropriate.

In response to a question from Senator Cook, Mr. Helms said the question as to how royalties are handled is a question that has been litigated. He said it was determined that the gas being injected was the gas being produced so a "first in first out" analysis was applied. He said a deduction was allowed for the gas that was injected as the gas that was initially produced was deemed to have already be subjected to royalty payments.

In response to a question from Senator Dotzenrod, Mr. Helms said it is still an unsettled question as to whether Bakken Formation wells that are not receptive to water flooding will also not be receptive to CO₂ injection. He said CO₂ acts much differently in a reservoir than water because CO₂ is a miscible fluid. He said CO₂ can reach the pore spaces within the rock whereas water cannot.

In response to a question from Chairman Unruh, Mr. Helms said if oil prices fall it can be expected that enhanced recovery projects in the planning phase would be postponed. He said recovery projects that have already commenced would likely continue despite falling oil prices. He said commenced projects would likely continue because once these types of projects are started they cannot be ceased without causing damage to the reservoir. He said the flood front will break down if operations are stopped midway through a CO₂ injection project. He said you rarely see this type of project suspend operations and then start up again because of the damage that would be caused to the reservoir. He said this is part of the reason companies are slow to commence these types of projects. He said once the project gets started it is like a freight train that must keep moving forward. He said these factors may be something the committee wishes to consider when deciding if it would be beneficial to front load the tax incentives related to investments in these types of projects.

Mr. Helms said the Energy and Environmental Research Center (EERC) has identified 28 unitized oil fields in North Dakota that have the potential for enhanced oil recovery using CO₂. He said from those fields, the EERC has estimated the potential for recovering 262 million barrels of oil. He said North Dakota is lacking in the amount of CO₂ needed for enhanced oil recovery. He said all the non-interruptible CO₂ from the Dakota Gassification Company (DGC) is being shipped to Canada. He said DGC has nine gassifiers and on any given day two of those gassifiers will go down. He said this results in DGC overproducing CO₂ to ensure an adequate supply of non-interruptible CO₂ is available for use in Canada. He said the resulting overproduction amounts to roughly 50 million cubic feet of interruptible CO₂, a certain amount of which is being vented. He said the Department of Mineral Resources is pursuing a class six primacy with the EPA to create a storage reservoir to house this vented CO₂. He said if enough CO₂ can be captured and stored, it would amount to non-interruptible supply of CO₂ that could be used in some of North Dakota's conventional reservoirs. He said the Department of Mineral Resources is still waiting for approval for this project.

Mr. Helms described what pore space looks like in a conventional reservoir compared to what it looks like in the Bakken Formation. He said CO₂ moves through the pore space in a conventional reservoir much easier than it moves through a Bakken Formation reservoir. He said when a reservoir is fracked, the CO₂ just flows through the reservoir and back up through the producing wells. He said the EERC is working on a method to allow CO₂ enhanced oil recovery to be successfully used in conditions similar to those found in the Bakken Formation. He said the 3 billionth barrel of oil was just produced in North Dakota. He said an estimated 7 billion barrels of oil could be produced from enhanced recovery methods. He said roughly 300 million tons of CO₂ would be needed each year for enhanced oil recovery.

In response to a question from Representative Steiner, Mr. Helms said he is aware of the process of using extremely cold gas to fracture rock. He said one company was achieving relatively good success using this method in the shallower horizontal gas plays of Alberta but the company went bankrupt as a result of the low price of oil.

In response to a question from Senator Cook, Mr. Helms said North Dakota currently produces 33 million tons of CO₂ per year. He said this production is all derived from power plants. He said CO₂ enhanced oil recovery would essentially require 10 times the amount of all CO₂ emissions produced from all the power plants in this state. He said if producers can get past the hurdles related to technology and costs, the state could actually grow the coal industry. He said the Department of Mineral Resources tracks coal reserves and the state has an 800-year supply of coal at existing consumption rates. He said the state could realistically grow the coal industry ten fold in order to consume coal reserves within the next 80 years. He said there would be a place to store all additional coal-related emissions if CO₂ enhanced oil recovery could be successfully used in the Bakken Formation.

Mr. Helms said, in terms of considering tax incentives to encourage enhanced oil recovery, the committee should keep in mind that a typical water flooding project requires twice the operating costs and twice the investment costs than are required during the primary recovery phase. He said operating and investment costs double again when a project moves from using water flooding to using CO₂. He said producers may be looking for some front end tax relief to cushion large upfront investment costs. He said this is especially true considering the first drop of oil will not be produced for up to two years and initial investment costs will not be recouped for up to five years.

In response to a question from Senator Bekkedahl, Mr. Helms said it may be beneficial to incentivize this type of production method upfront. He said upfront incentives could take the form of sales tax incentives or tax relief on upfront incremental oil recovery that phases out once a project begins to move into more established stages.

In response to a question from Representative Hatlestad, Mr. Helms said it is not necessary to employ water flooding prior to using CO₂. He said reservoirs in Texas have gone directly to using CO₂ and some reservoirs in North Dakota have gone directly to using high pressure air injection. He said many producers will use water flooding to keep a reservoir's pressure up until they are ready to inject CO₂.

In response to a question from Representative Headland, Mr. Helms said North Dakota does not have any natural sources of CO₂ like those feeding enhanced recovery in the Permian Basin. He said if CO₂ is used for enhanced recovery in this state it will either need to be piped in from outside sources or recovered from anthropogenic sources like power plants.

In response to a question from Senator Cook, Mr. Helms said he could provide the committee with a chart showing the amount of CO₂ produced on an annual basis in each state.

Senator Cook asked if a point would ever be reached where there would not be enough CO₂ produced in the United States to supply the demand for enhanced oil recovery. In response, Mr. Helms said that point may have already been reached. He said the natural CO₂ sources in New Mexico and Colorado are already operating at their

maximums so Eagle Ford and some of the new shale plays in the Permian Basin are actually entering into a CO₂ starved state. He said this scenario is not beneficial for North Dakota because, as the previous speaker indicated, North Dakota has to compete for enhanced oil recovery projects with Mississippi, the Gulf Coast, and Wyoming.

In response to a question from Senator Cook, Mr. Helms said there is not much certainty when it comes to the price of CO₂. He said all of the cheap CO₂, priced from 50 cents to 1 dollar, has already been used or is otherwise committed. He said going forward, CO₂ will be more expensive and will need to be captured from anthropogenic sources. He said the Allam Cycle project appears to be a huge breakthrough in terms of CO₂ capture and liquefaction. He said investments similar to the \$5 million the legislature allocated towards this project should be considered when aiming to keep the price of CO₂ at half the cost of natural gas or lower.

In response to a question from Senator Cook, Chairman Unruh said an update on the Allam Cycle project is tentatively scheduled for the committee's next meeting.

In response to a question from Mr. Walstad, Mr. Helms said he was not aware of whether sales tax is applied to CO₂ captured from a coal operation and later sold to an enhanced oil recovery operation.

Chairman Unruh said the committee may need to review the various points of taxation occurring within multiple stages of the recovery process when determining the future of enhanced oil recovery in this state.

Tax Department

Chairman Unruh called on Mr. Joe Morrisette, Deputy Tax Commissioner, Tax Department, for presentation of information ([Appendix D](#)) on tax incentives pertaining to oil and gas recovery and enhanced recovery and an overview of the revenue impacts related to these incentives. Mr. Morrisette said, to address a prior question, gross receipts from the sale of CO₂ for enhanced recovery of oil or natural gas is exempt. He proceeded to review his handout summarizing all of the current oil and gas exemptions, including those expiring at the end of 2015 and those already eliminated as a result of 2015 House Bill No. 1476. He reviewed the exemptions for stripper wells and stripper well property. He said the stripper well property exemption was removed in 2013 to close a perceived loophole in which higher producing horizontal wells were benefiting from an oil extraction tax exemption.

Mr. Morrisette reviewed the history behind the large trigger and said the trigger had not been met in the current fiscal year. He said provisions relating to the large trigger will no longer be in place after November of this year.

In response to a question from Senator Bekkedahl, Mr. Morrisette said he does not believe any wells qualifying for the stripper property exemption prior to its removal in 2013 are still carrying that exemption today.

In response to a question from Senator Dotzenrod, Mr. Morrisette said the fact that there have been no additional wells certified under the expanded definition of a stripper well since July 2013 has to do with the fact that the average daily production thresholds used to qualify a well are measured over a 12-month period. He said that 12-month period of time would have to pass before the qualifying data would be available.

Mr. Morrisette said the exemption that was in place for wells drilled before July 31, 2013, on nontrust lands within the boundaries of a reservation will cease at the end of December. He said as of the end of May 2015 there were 619 wells that qualified for that exemption, which amounted to a \$393 million reduction in revenues. He said not all of the \$393 million reduction was derived from state revenues due to the tribal revenue sharing agreement.

Mr. Morrisette reviewed the exemptions contingent on the large trigger being in place. He said these exemptions have not had any fiscal effect as the large trigger has not been in place since October 2004. He also reviewed the provisions of the small trigger which were based on a different triggering mechanism. He said the small trigger triggered on in February and remained on through the statutory sunset date of June 30, 2015. He said as of the end of May 2015, a revenue reduction of nearly \$23 million had been recorded as a result of the 544 wells qualifying under the provisions of the small trigger. He said this amount is expected to increase to a total of \$82 million once the final reports from these wells are received through the end of December.

Mr. Morrisette reviewed the exemption for wells drilled outside the Bakken and Three Forks Formations and the exemptions for incremental production from a secondary or tertiary recovery project. He said there have only been four secondary recovery projects that qualified for the exemption from July 2008 through May 2015. He said the oil extraction tax exemption for these four projects resulted in a revenue reduction of \$1.9 million. He said no tertiary projects have yet received the exemption.

In response to a question from Senator Cook, Mr. Morrisette said in regard to the tertiary exemption Denbury may qualify for, the exemption would extend for a duration of 10 years because Denbury's operations are located outside of the Bakken Formation.

In response to a question from Representative Headland, Mr. Morrissette said prior to the changes made during the most recent legislative session, the exemption available for enhanced recovery using CO₂ was not limited in duration. He said following the most recent legislative session, the exemption is now limited to 10 years.

COMMITTEE DISCUSSION AND DIRECTIVES

Chairman Unruh directed the committee to review the proposed language of the RFP for oil and gas industry and economic consultants. She said the committee previously suggested reviewing enhanced recovery methods in addition to methods using CO₂ and Mr. Helms noted a review of water injection methods would also be beneficial over the course of the study. She said by utilizing the services of a consultant, the committee may be able to receive data containing proprietary information that it may not be able to receive on an individual basis from interested companies. She said a consultant may be able to supply the committee with a broader and more accurate view of the information needed to conduct a thorough study of the subject matter. She said in addition to consulting services, she also anticipates receiving testimony from a representative of DGC and information on the Allam Cycle and the Kemper County Project in Mississippi. She welcomed any committee discussion regarding the draft RFP.

Representative Hatlestad said he would like to review the potential for using natural gas for enhanced recovery.

Representative Steiner said she would like the study to include information regarding companies' return on investment, whether this information be received in the aggregate or based on a certain range. She said it would be beneficial for the committee to learn about the types of investments these companies are making and the types of incentives that may factor in to these companies' decisions. She emphasized the importance of receiving information from industry over the course of the study.

Senator Cook said one of the committee's studies mandates that information be received from the EERC on the potential future usage of CO₂ in enhanced oil recovery. He said the other issue the committee needs to focus on centers around tax incentives and future tax policy. He said the testimony received by Denbury highlights the importance of providing certainty in tax policy. He said this state needs to be mindful of the message being sent to companies that have invested, or are planning to invest, substantial dollars in the state when making changes to tax policy. He said decisions need to be made in an informed manner and need to be based on as much information as is available. He said there is much the committee needs to learn in terms of making informed policy decision in this developing area.

Chairman Unruh said she agrees with the need to provide certainty in tax policy and receive as much information as possible in order to make informed decisions. She said the committee has the opportunity to take advantage of the time and resources provided over this interim to learn about the technological and taxation aspects relating to the studies and review the practices being used in other states to ensure a sound taxation policy in North Dakota.

In response to a question from Senator Dotzenrod, Chairman Unruh said the goal of the study is to determine the best tax policy for the state, whether that involves sticking with tax policy that is already on the books or creating something completely new based on what the committee learns over the course of the study.

Senator Cook said the committee should be able to work hand in hand with any consultants who are ultimately selected. He said he does not want the language in the RFP to be too specific as to limit the information the consultant will provide. He said he hopes the consultant will work with the committee throughout the entire process and be flexible in providing additional information the committee may wish to receive.

Chairman Unruh said she envisions having the consultant report to the committee throughout the course of the interim in addition to providing a final report. She said the committee will have the opportunity to include more specific language in the contract that is ultimately executed with any consultants who are selected.

Committee Counsel directed the committee's attention to the portion of the RFP providing for periodic written reports from any selected consultant in addition to the provision of a final report.

In response to a question from Representative Headland, Chairman Unruh said the use of a consultant may be key to receiving data that may otherwise be deemed as proprietary by individual companies. She said the EERC may apply to provide consulting services if they so desire to be involved in that process.

In response to a question from Senator Cook, Chairman Unruh said the committee members will have the opportunity to ask more specific questions of applicants prior to making a recommendation to the Chairman of the Legislative Management. She said the question and answer portion of the applicant review should help the committee better understand what types of services potential consultants may be able to provide.

It was moved by Representative Headland and seconded by Senator Cook that the language of the RFP be forwarded to the Chairman of the Legislative Management for approval and publication.

Mr. Walstad suggested adding the phrase "and directives from," after the language providing for "periodic reports to" the committee.

Chairman Unruh asked if Representative Headland would care to amend his motion to include the addition of this language.

The motion was amended and it was moved by Representative Headland, seconded by Senator Cook, and carried on a voice vote that the language of the RFP be amended to include the language recommended by Mr. Walstad.

It was moved by Representative Headland, seconded by Senator Cook, and carried on a roll call vote that the RFP, as amended, be forwarded to the Chairman of the Legislative Management for approval and publication. Senators Unruh, Bekkedahl, Cook, and Dotzenrod and Representatives Dockter, Hatlestad, Headland, Kading, Kasper, Kelsh, Steiner, and Strinden voted "aye." Representative Froseth voted "nay."

The finalized RFP ([Appendix E](#)) was forwarded to the Chairman of the Legislative Management for signature and posting on the Legislative Council's website following the adjournment of the meeting.

No further business appearing, Chariman Unruh adjourned the meeting at 1:45 p.m.

Emily L. Thompson
Counsel

ATTACH:5