

# Technical Reviewers' Rating Summary

Proposal Number	<b>G-61-04</b>
Application Title	<b>Injection Testing with Propane to Inform Future Bakken CO2 EOR Pilot</b>
Submitted By	<b>EERC</b>
Request For	<b>\$1,800,000.00</b>
Total Project Costs	<b>\$4,000,000.00</b>

## Section A. Scoring

Statement	Weight	G-61-04A	G-61-04B	G-61-04C	Avg. Score
1. Objectives	9	4	5	4	39
2. Achievability	7	4	5	3	28
3. Methodology	8	4	4	4	32
4. Contribution	8	4	5	4	34
5. Awareness / Background	5	5	4	4	21
6. Project Management	3	4	4	4	12
7. Equipment / Facilities	2	3	4	4	7
8. Value / Industry - Budget	4	4	4	4	16
9. Financial Match - Budget	4	4	4	3	14
<b>Avg. Weighted Score</b>		<b>203</b>	<b>224</b>	<b>189</b>	<b>205</b>

**OVERALL**

FUND	<b>X</b>	<b>X</b>	<b>X</b>
TO BE CONSIDERED			
DO NOT FUND			

## Section B. Ratings and Comments

1. The objectives or goals of the proposed project with respect to clarity and consistency with North Dakota Industrial Commission/Oil and Gas Research Council goals are:  
**“The proposed grant application goals align closely with several of the OGRP’s objectives and purposes, including the following: • Promote efficient, economic, and environmentally sound exploration, development, and use of North Dakota’s oil and gas resources. • Preserve and create jobs involved in the exploration, production and utilization of North Dakota’s oil and gas resources. • Ensure economic stability, growth, and opportunity in the oil and gas industry • Encourage, and promote the use of new technologies and ideas that will have a positive economic and environmental impact on oil and gas exploration, development, and production in North Dakota. ”**  
*- Reviewer: G-61-04A*  
*- Rating: 4 (Very Clear)*  
“”  
*- Applicant*  
**“In the objective, EERC outlines a suite of activities, from laboratory testing to phase behavior and miscibility, reservoir surveillance, along with modeling-based activities to determine optimal injection and operational strategies. ”**  
*- Reviewer: G-61-04B*  
*- Rating: 5 (Exceptionally Clear)*  
“”  
*- Applicant*  
**“The project goals are very clear with the proposal.”**  
*- Reviewer: G-61-04C*  
*- Rating: 4 (Very Clear)*  
“”  
*- Applicant*

2. With the approach suggested and time and budget available, the objectives are:

**“The objectives outlined in the proposal appear achievable within the proposed budget and timeline. The team at the EERC and the proposed industry partners bring extensive experience in planning and executing similar research projects. The only potential timeline concern arises from Task 4 (field propane injection) commencing before the completion of lab tasks 3.2 and 3.3.”**

**- Reviewer: G-61-04A**

**- Rating: 4 (Most Likely Achievable)**

“”

**- Applicant**

**“Prior to the establishment of the federally funded Bakken CO2 EORSFL, the various activities outlined in the objective section appear to be achievable within 12 months with Chord Energy's in-kind contributions and EERC expertise. The proposed effort is a pre-pilot program to gain working knowledge prior to 2026 or early 2027 use of EORSFL.”**

**- Reviewer: G-61-04B**

**- Rating: 5 (Certainly Achievable)**

“”

**- Applicant**

**“Depending on the specifics of the field injection test the objectives may be more difficult to achieve than stated in this proposal.”**

**- Reviewer: G-61-04C**

**- Rating: 3 (Likely Achievable)**

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**- Applicant**

3. The quality of the methodology displayed in the proposal is:

**“The proposed methodology is thorough and follows a logical sequence of tasks and objectives. No major omissions or significant concerns were identified during the review process.”**

**- Reviewer: G-61-04A**

**- Rating: 4 (Above Average)**

**“**

**- Applicant**

**“Tasks and phases are clearly articulated in the methodology section. It is appreciated that EERC and Chord are willing to pull in Liberty Resources Gordon Pospisil, who has extensive experience in reservoir stimulations. This indicates forward looking results that will benefit all of North Dakota's oil and gas industry. ”**

**- Reviewer: G-61-04B**

**- Rating: 4 (Above Average)**

**“**

**- Applicant**

**“The methodology appears to be sound within the proposal.”**

**- Reviewer: G-61-04C**

**- Rating: 4 (Above Average)**

**“**

**- Applicant**

4. The scientific and/or technical contribution of the proposed work to specifically address North Dakota Industrial Commission/Oil and Gas Research Council goals will likely be:

**“The proposal aims to address a critical issue: extending the life of the Bakken oilfields and maximizing ultimate oil and gas recovery. With many parts of the Bakken system nearing or reaching maturity, operators must begin implementing strategies for secondary and tertiary oil recovery. Notably, to date, there appears to be no comparable research in North Dakota utilizing heavier NGLs, such as propane, as a working EOR fluid.”**

**- Reviewer: G-61-04A**

**- Rating: 4 (Very Significant)**

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**- Applicant**

**“Researching the methodologies for successful EOR in the Bakken shale will yield huge dividends for the State of North Dakota in increases of technologically extractable oil and gas production from the resource. More knowledge on underground CO<sub>2</sub> is also likely from this project.”**

**- Reviewer: G-61-04B**

**- Rating: 5 (Extremely Significant)**

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**- Applicant**

**“This project will contribute significantly to the understanding of reservoir properties in the Bakken/Three Forks Formations with respect to further EOR operations.”**

**- Reviewer: G-61-04C**

**- Rating: 4 (Very Significant)**

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**- Applicant**

5. The background of the principal investigator and the awareness of current research activity and published literature as evidenced by literature referenced and its interpretation and by the reference to unpublished research related to the proposal is:

**“The applicant team’s background is incredibly strong, with extensive experience in subsurface research and development, as demonstrated by their prior projects in the Bakken. The EERC and its partners demonstrate a strong understanding of current research activities and literature, along with the ability to leverage a wealth of previous parallel subsurface work. I would argue that no better team is suited to execute the proposed project.”**

**- Reviewer: G-61-04A**

**- Rating: 5 (Exceptional)**

**“**

**- Applicant**

**“EERC has worldclass researchers with extensive experience in Bakken Shale research.”**

**- Reviewer: G-61-04B**

**- Rating: 4 (Better Than Average)**

**“**

**- Applicant**

**“The personnel from the EERC appear to have excellent knowledge of the subject.”**

**- Reviewer: G-61-04C**

**- Rating: 4 (Better Than Average)**

**“**

**- Applicant**

6. The project management plan, including a well-defined milestone chart, schedule, financial plan, and plan for communications among the investigators and subcontractors, if any, is:
- “The project management plan is well-structured, featuring clearly defined tasks, milestones, and a detailed schedule. The financial plan is appropriately detailed, outlining the allocation structure with the proposed project partners and consultants. The communication strategy is expected to align with the proven approach used in past EERC-led research projects.”**
- Reviewer: G-61-04A*  
*- Rating: 4 (Very Good)*  
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- Applicant*  
**“All information requested was provided including a well-defined gantt chart indicating when each task and subtask will be completely. ”**
- Reviewer: G-61-04B*  
*- Rating: 4 (Very Good)*  
“”
- Applicant*  
**“The project management plan is clearly illustrated.”**
- Reviewer: G-61-04C*  
*- Rating: 4 (Very Good)*  
“”
- Applicant*

7. The proposed purchase of equipment and the facilities available is:

**“The proposal does not involve significant new equipment purchases, as it primarily utilizes existing EERC facilities. The facility-related expenses, including those for lab work and computational resources, appear reasonable and well-aligned with the project objectives.”**

**- Reviewer: G-61-04A**

**- Rating: 3 (Justified)**

**“**

**- Applicant**

**“Costs associated with EERC laboratories and Services are well defined and justified. Industry share of \$2.2 million is also specified costs associated with acquiring propane along with Transportation of propane, injection in the field, pumping costs, downhole work and surface work. ”**

**- Reviewer: G-61-04B**

**- Rating: 4 (Well Justified)**

**“**

**- Applicant**

**“**

**- Reviewer: G-61-04C**

**- Rating: 4 (Well Justified)**

**“**

**- Applicant**



8. The proposed budget “value”<sup>1</sup> relative to the outlined work and the commitment from other sources is of:

**“The application appears to provide strong value for the proposed work, with a \$1.8 million funding request complemented by a \$2.2 million in-kind contribution from Chord Energy. If successfully completed, the insights gained from this project could substantially enhance oil production from the Bakken/Three Forks system, resulting in significant economic benefits and increased tax revenues for the state, industry, and royalty owners.”**

*- Reviewer: G-61-04A*

*- Rating: 4 (High Value)*

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*- Applicant*

**“This project is key to cracking the EOR code for the ND oil and gas industry with the additional benefits in CO2 storage and reduction of the carbon footprint of production.”**

*- Reviewer: G-61-04B*

*- Rating: 4 (High Value)*

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*- Applicant*

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*- Reviewer: G-61-04C*

*- Rating: 4 (High Value)*

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*- Applicant*

9. The “financial commitment”<sup>2</sup> from other sources in terms of “match funding” have been identified:
- “The applicant's estimated financial commitment from Chord appears adequate, with the requested \$1.8 million representing 45% of the total projected cost.”**
- Reviewer: G-61-04A*
- Rating: 4 (High Value)*
- “”
- Applicant*
- “Chord Energy is providing \$2.2 million while the project is asking for \$1.8 million from the NDIC. This is a 55/45 split in costs, with both sides gaining significant information towards a future of successful EOR in ND. ”**
- Reviewer: G-61-04B*
- Rating: 4 (High Value)*
- “”
- Applicant*
- “Chord energy appears to only be contributing propane to the testing program, this would have been better if the contribution was across the entire project including field testing costs.”**
- Reviewer: G-61-04C*
- Rating: 3 (Average Value)*
- “”
- Applicant*

## General Comments

“The proposed work could provide significant economic and strategic value for North Dakota’s oil industry, and I recommend funding the application in full.

The next five to ten years will be critical for North Dakota’s oil industry as thousands of wells approach the end of their economic primary recovery phase, necessitating strategies to extend their productive life and maximize ultimate recovery. Given that current federal tax incentives favor CO2 sequestration for at least twelve years, research into alternative working fluids, as proposed in this application, is particularly urgent.

While previous EOR efforts in the Bakken have predominantly focused on lighter NGLs (ethane), wet field gas, or dry/residue gas, research and company data from other U.S. oilfields suggest that propane or heavier NGLs may serve as highly effective working fluids in unconventional resource plays. This application offers to further explore such alternatives, taking important steps forward towards unlocking effective enhanced recovery methods for the Bakken/Three Forks.

”

**- Reviewer: G-61-04A**

“EOR is a topic that has been in conversation literally since the beginning of the success of the extraction of the resource from Bakken Shale. It was known that technological advancement was key to being able to extract a larger proportion of oil and gas from the shale. While the industry has been increasing its extraction efficiencies over time, they are still at or below being able to extract 20% of the resource, EOR is key to getting that efficiency up to 50%. ”

**- Reviewer: G-61-04B**

“The project appears to be a necessary step forward in assessing the EOR potential of the Bakken/Three Forks systems. However, the limited financial commitment from Chord Energy beyond the purchase of propane is not ideal.”

**- Reviewer: G-61-04C**

*1 “value” – The value of the projected work and technical outcome for the budgeted amount of the project, based on your estimate of what the work might cost in research settings with which you are familiar. A commitment of support from industry partners equates to a higher value.*

*2 “financial commitment” from other sources – A minimum of 50% of the total project must come from other sources to meet the program guidelines. Support less than 50% from Industrial Commission sources should be evaluated as favorable to the application; industry partnerships equates to increased favorability.*