Technical Reviewers' Rating Summary

Proposal Number G-030-06 Application Title Program to Determine the Submitted By EERC Request For $8,000,000.00 Total Project Costs $115,230,000.00

Section A. Scoring

Statement	Weighting Factor	G-030-06A	G-030-06B	G-030-06C	Average Weighted Score
1. Objectives	9	**3**	**4**	**4**	**27**
2. Achievability	7	**3**	**4**	**4**	**21**
3. Methodology	8	**5**	**5**	**4**	**32**
4. Contribution	8	**5**	**4**	**4**	**32**
5. Awareness / Background	5	**4**	**5**	**5**	**20**
6. Project Management	3	**3**	**4**	**5**	**12**
7. Equipment / Facilities	2	**4**	**4**	**4**	**8**
8. Value / Industry - Budget	4	**5**	**4**	**5**	**16**
9. Financial Match - Budget	4	**5**	**4**	**5**	**16**
Average Weighted Score		**205**	**213**	**216**	**211**
	Total: 50				**250 possible points**

OVERALL RECOMMENDATION

FUND	**X**	**X**	**X**
FUNDING 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 wide scope of the project makes a very precisely defined and measurable goal difficult, but the overall goal is clear and consistent with the ND OGRC goals. Reporting goals are well defined for the project, and timely reporting will be critical to the optimal dispersal of completion data and incremental results acquired during the project.
   - Reviewer: G-030-06A

- Rating: 3

The goals were well defined and repeated throughout the documentation. I thought it was very well prepared. The objectives are relevant current topics in the development of the Bakken in ND.
- Reviewer: G-030-06B
- Rating: 4

the goals very clear. But phase V looks more like a "best practices" process, which is a little different than the prevvious phases.
- Reviewer: G-030-06C
- Rating: 4

“The Principal Investigators thank the reviewers for their time, careful consideration, respectful comments, and constructive suggestions regarding project complexity and attendant challenges in program management.”
- Applicant

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

A project involving the drilling and completion of up to 11 new horizontal wellbores is a difficult logistical operation and likely to experience some delays, some from within the project, and others involving resources from outside the project, that are difficult to predict. However, the main operator, Continental Resources, Inc., has extensive experience drilling and completing wells in the Williston Basin and should be able to bring sufficient resources to bear to keep the project on or close to schedule, and with their experience level, has likely risked the timing sufficiently to accommodate some level of delay and still stay on schedule, overall.
- Reviewer: G-030-06A
- Rating: 3

Continental has a lot of experience in drilling and completing wells and EERC has the experience in the analyzing portions. It looks to be well thought out and justified and is certainly achievable.
- Reviewer: G-030-06B
- Rating: 4

No comment
- Reviewer: G-030-06C
- Rating: 4

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

This project will employ technology that is well beyond that which has been normally employed within the Williston Basin, or the oil and gas industry development of unconventional resources, and could be considered a state of the art experiment. The EERC is assigning several well qualified researchers and high-tech research equipment resources.

Continental Resources, Inc., is employing many data acquisition logging tools, seismic and micro-seismic, pressure monitoring, and coring operations that are normally not utilized in a typical Bakken or Three Forks well, to assist in quantifying the reservoir and production results.
- Reviewer: G-030-06A
- Rating: 5

I haven't seen any that are better presented than this one.
- Reviewer: G-030-06B
- Rating: 5

No comment
- Reviewer: G-030-06C
- Rating: 4

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:

   This project has the potential to produce results that will be of significant benefit to the oil and gas industry in North Dakota. A project of this type has never been attempted within North Dakota, if anywhere within the world, and potentially could produce new, previously unknown, and valuable information about hydraulically fractured, multi-stage, horizontal wellbore completions involving multiple stacked producing horizons.
   - Reviewer: G-030-06A
   - Rating: 5

   It is targeting some of the biggest problem areas when addressing trucking, fresh water use, flaring issues, and optimum well density as well as the number of producing zones in the Bakken and whether they are all connected or independent. The technical contribution is likely to be very high.
   - Reviewer: G-030-06B
   - Rating: 4

   the research aspect of the proposed work will be valuable for continued develpment of the Bakken.
   - Reviewer: G-030-06C
   - Rating: 4

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:

   John Harju, with the EERC, has substantial credentials in regard to oil and gas production research, and the Bakken/Three Forks petroleum system. Mr. Harju has been responsible for supervision of prior work involving research analysis of completion databases of Bakken and Three Forks wells performed by the EERC. Stan Wilson has extensive experience overseeing the development of Continental Resources' extensive acreage in the Bakken and

Three Forks in the Williston Basin, and has already been involved with Continental Resources' groundbreaking exploration into the potential of the lower intervals of the Three Forks formation.
- Reviewer: G-030-06A
- Rating: 4

John Harju and Stan Wilson are very familiar with current research and literature. The proposed methods section was using leading technology and trying to develop more.
- Reviewer: G-030-06B
- Rating: 5

No comment
- Reviewer: G-030-06C
- Rating: 5

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:

   A broad timetable indicating the major phases within the project is provided. Several wells will likely be in different stages of drilling, completion, and production throughout the duration of the first 6 to 9 months, making a very detailed timetable difficult to produce for the entire duration of the project. It is likely, due to unforeseen issues, that the order of drilling, completion and producing individual wells is likely to change as the project advances.
   - Reviewer: G-030-06A
   - Rating: 3

   Very well defined and I especially liked the emphasis on the dissemination of results - how and when it would be done. This results information/data can be used industry wide.
   - Reviewer: G-030-06B
   - Rating: 4

   No comment
   - Reviewer: G-030-06C
   - Rating: 5

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

   It appears the purchase of any materials by the NDIC share is limited to primarily research, office, and laboratory supplies necessary for the project. Continental Resources, Inc., will fund the purchase of those materials necessary for the construction of the wellbores, production facilities, locations, and all other normal oil and gas well operations and equipment.
   - Reviewer: G-030-06A
   - Rating: 4

   Again, the principal players are well qualified and know what it will cost and what is needed to accomplish this project.

- Reviewer: G-030-06B
- Rating: 4

No comment
- Reviewer: G-030-06C
- Rating: 4

8. The proposed budget "value"1 relative to the outlined work and the commitment from other sources is of:

   It is difficult to place a relative value on the proposed research into optimizing hydraulically fractured completions in horizontal wellbores within multiple stacked producing horizons, since it is unlikely this type of partially public-funded project, funded and performed in concert with private oil and gas industrial partners, has ever been attempted before on this scale, to address the area of research involved. It is likely that the value will be high regardless of the results of the project, as even a perceived failure to economically produce oil and gas from a wellbore will still generate significant technical data on horizontal wellbore fracturing and completion methods.
   - Reviewer: G-030-06A
   - Rating: 5

   My personal thought is it is very reasonable. Only thing I'm not sure of is if the OGRC has $3MM, $2MM, & $2MM to give over a three-year time frame.
   - Reviewer: G-030-06B
   - Rating: 4

   No comment
   - Reviewer: G-030-06C
   - Rating: 5

9. The "financial commitment"2 from other sources in terms of "match funding" have been identified:

   The ND OGRC funding amounts to a total of $8,000,000, or less than 7% of the entire project, with industry providing $107,230,000 of matching funds as cash and in-kind contributions from Continental Resources, Inc., and Bakken producer consortium partners.
   - Reviewer: G-030-06A
   - Rating: 5

   Most of the funding in the end is coming from others. Much more than 50% if the final cost ends up in the circa $115-million range.
   - Reviewer: G-030-06B
   - Rating: 4

   bascially operating company allowing for additional data gathering in the course of their drilling and completion process--in valuable ..
   - Reviewer: G-030-06C
   - Rating: 5

- Applicant

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.

General Comments

The project has great potential to generate fracturing and completion data that, prior to this project, had never been produced on this scale. While some generated data will be immediately useful, it is important to properly qualify any early results to prevent inadvertent use of results to promote value. Early results may be not always be representative of the long-term results. This project has built into it, a strategy to evaluate completion results for a sufficient time to alleviate most of those issues, but patience will be needed to prevent misuse or misrepresentation of preliminary results.
- Reviewer: G-030-06A

This proposed project was very well presented. It is obvious that EERC has been around for awhile and knows exactly what and how to present. The project has a lot of high-powered involvement and the results could be very valuable to North Dakota.
- Reviewer: G-030-06B

the project is massive in its reach, but if any or all goals succeed , it will have major impact to the industry in ND. The only observation , as noted above, was phase V. Phase V certainly would be valuble, but just seemed not to "fit" within the rest of study.
- Reviewer: G-030-06C