

Minutes of the  
**RENEWABLE ENERGY  
COUNCIL**

Tuesday, June 26, 2018 – 1:30 p.m. (CDT)  
Icelandic Room, North Dakota Department  
of Commerce, Bismarck, ND

**CALL TO ORDER**

**Members Present:** Jay Schuler (phone), Al Christianson, David Douglas (phone), Randy Schneider, Rod Holth (phone), Terry Goerger (phone), Mark Nisbet

**Others Present:**

Andrea Pfennig, ND Industrial Commission  
Karlene Fine, ND Industrial Commission  
Denise Faber, ND Department of Commerce  
Adam Dunlop, Midwest AgEnergy Group  
Jeff Zueger, Midwest AgEnergy Group

Al Christianson called the Renewable Energy Council meeting to order.

**WELCOME AND OPENING  
COMMENTS**

Christianson welcomed everyone.

**APPROVAL OF MINUTES**

April 9, 2018, meeting minutes were reviewed.

Schneider moved to approve the minutes as presented. Nisbet seconded the motion. All in favor. Motion carried.

**PRESENTATION OF FINANCIAL  
SUMMARY**

Fine presented the financial summary, which was also posted on the website. The financial statement shows that we received all the revenues we were to receive from the Resources Trust Fund as of April 30. We've had some expenditures and outstanding

project commitments. As of April 30, 2018 uncommitted dollars available for this grant round and future grant rounds in this biennium are \$3,821,613.81. Fine noted that the commitment made to the "Novel Approach to Reduce the Energy Consumption of Residential Homes" project has been returned and has been included in these numbers.

Schneider asked if it was shared why that project didn't advance. Fine answered that the first phase that was being funded through a Department of Commerce program wasn't completed. Pfennig added that the main problem was the developer. They would have needed to look at a different developer and they did not go through the first phase with State Energy Program (SEP) because they were having so many problems with that developer. If they would have switched developers, it would have changed the scope completely. They were also having trouble with the Public Service Commission with permitting, so they wanted to figure that out first before they moved forward.

**CONSIDERATION OF GRANT ROUND  
37 APPLICATION**

Pfennig stated that this was a special grant round. We received one application for this grant round and it was sent to technical reviewers for peer review.

**R037-A: "Barley Protein Concentrate";**  
**Submitted by Midwest AgEnergy Group;**  
**Principal Investigator: Jeff Zueger;**  
**Project Duration: 4 months; Total Project**  
**Costs: \$167,620; Request for: \$83,810.**

Pfennig gave an overview of the project. The total amount requested is \$83,810. The project title is Barley Protein Concentrate (BPC). Total project costs are \$167,620,

which includes \$66,410 cash from Midwest AgEnergy Group, and \$17,400 in-kind (\$12,000 Montana Microbial Products (MMP); \$3,000 ND Barley Council, and \$2,400 Dr. Burrows).

The project's objectives are to demonstrate the feasibility of scaling up the technology owned by MMP and integrating it into Dakota Spirit AgEnergy (DSA); to determine the feasibility of securing barley that meets the quantity and specifications required; and to analyze the market potential for advanced biofuel and barley protein.

All reviewers recommended to fund (212, 193, and 209). Average weighted score was 205 out of 250.

Two reviewers felt that the project was achievable. One reviewer had significant concerns about the ability to complete the engineering study in the timeframe proposed.

In regards to the methodology, one reviewer felt limited detail was provided for the feedstock study and products study. One reviewer felt a survey of producers regarding their willingness to shift production from other crops to barley is needed. It was noted that crop insurance will also be a decision factor for producers and should be considered. One reviewer stated that BPC is not superior to fish meal or soy protein concentrate as suggested. Studies with trout resulted in lower growth and nutrient digestibility, which is important when considering the value of BPC in the aquaculture feed market.

All three reviewers felt the scientific/technical contribution could be very significant if successful.

One reviewer noted that the applicant has a strong reputation for biorefinery development. One stated that while BPC value and utilization are not the Principal Investigator's strength, Dr. Rick Burrows is an expert in that arena.

One reviewer felt the proposal failed to discuss the relative performance and value of competitors. The same reviewer noted that some estimates of the potential carbon balance for barley should have been included.

One reviewer noted that the proposal would have been strengthened by letters of support from MMP and Dr. Burrows. One reviewer again questioned the ability to complete the engineering study in the timeframe.

For the management plan, one reviewer felt that the "checkpoints" referenced was very vague and should be fully described with actions to be taken, and how outcomes will dictate movement forward.

None of the reviewers had significant concerns regarding the budget.

Overall comments included one reviewer feeling there could be multiple benefits from the project, including increase in barley production which could benefit soil fertility by reducing salinity, and development of protein isolates from barley is synergistic with the development of pulses.

One reviewer supported the project but had three main concerns – 1) ability to achieve the objectives in the proposed timeframe; 2) no data regarding the lifecycle carbon intensity of barley ethanol versus traditional corn ethanol (conducting the necessary life cycle analysis (LCA) would be a significant study in itself); and 3) no data on the composition and performance of the BPC in

the fish trials was referenced. Some estimate of economic value in comparison to fish meal and other alternatives could be provided on this.

One reviewer felt this could benefit the economy, noting that although BPC is not a superior feed ingredient to fish meal or soy protein concentrate, it can be part of the solution to reducing reliance on fish meal and reducing the cost of fish production.

The technical advisor's recommendation is to fund. This is an opportunity for both value-added agriculture and value-added ethanol. It could provide additional markets for barley, which has essentially become a specialty crop. It would enhance diversification at a North Dakota ethanol plant. Additionally, this could help North Dakota get a foothold in the aquaculture industry.

The following information would be helpful: 1) preliminary information regarding the market size for protein feed ingredients; 2) preliminary data regarding the lifecycle carbon intensity of barley ethanol versus traditional corn ethanol; and 3) more information regarding the checkpoints and who will be responsible for each of the studies, along with information regarding how fatal flaws will be defined and determined.

Suggested contingencies, if funded, would be that letters of support for the match would be provided from all three.

Jeff Zueger and Adam Dunlop presented the project.

Schneider asked a question regarding the possibility of protein levels at 14 percent. Normally, malting barley needs to have a lower protein. He assumes that for this project, the higher the number the better. Dunlop replied that this would not be malting barley, this would be feed barley and to the producer

that tells them that they can add nitrogen to get the protein higher. Schneider stated that the prices would be closer to feed barley pricing than it would be for malting. Dunlop stated that they need to figure out the pricing.

Nisbet asked what the characteristics are that would qualify as an advanced biofuel. Dunlop replied that to be considered an advanced biofuel, it cannot come from corn kernels, and it has to achieve a 50 percent greenhouse gas reduction versus the hydrocarbon fuel established in 2007.

Nisbet asked where the market is for the advanced biofuels. Dunlop responded that the molecule itself would be identical to a molecule of ethanol created from corn. DSA, in particular, has a pathway into California and there is a market out there for low carbon fuel, which, if you're achieving a 50 percent Greenhouse Gas (GHG) reduction, you're going to be considered a low carbon fuel. He would see that as being the primary destination for this product, just like most of the product produced at DSA already.

Schuler asked when comparing the product to fish meal, how does it compare to soybean meal and is that the most common meal we produce in the US. Dunlop responded that they have been led to believe that soybean meal can constitute about 30 percent of a trout or salmon's diet, which is limited and may have some of the anti-nutritional components to it. Zueger added that better stated would be soybean meal concentrate, soybean meal that's been concentrated to remove of the bad actors could move into carnivorous based fish. Soybean meal itself could be in vegetative fish at any given ration, but as you cycle the ration up it begins to have processing and digestive issues. This is from the resources that we have engaged with, including relying significantly on the Clear Springs' \$1.2 million trout and fresh water trial that they did from fingerlings to filets, this is the superior product to those types of products.

Shuler asked whether they anticipate the market will be domestic or export. Dunlop responded that the license would be exclusive to North America. As to the questions about aquaculture and the world market, and where the protein needs to be grown and delivered to there is a large export opportunity as well. Zueger commented that they have talked with the executives at Clear Springs and they have indicated that they would want first rights to this product if we would be so inclined to start producing it. They would feed it at the highest level of ration that they could because of not only the nutritional components, but the phosphorous component in the water discharge permit that they have in the Snake River in Idaho. This helps solve some of their issues with water contamination, so that represents a 5-10,000 ton per year market just at Clear Springs alone, which is 25-50% of anticipated production.

Pfennig asked if the market for ethanol is in California, if you get approval from EPA do you also need approval from the California Air Resource Board (CARB) as well. Dunlop responded yes. Pfennig also asked if they have had any discussions at all with CARB. Dunlop responded that they have had a series of discussions with California about all types of projects and opportunities. They know that this, among other things, is on our radar, and the good thing is that we already have a pathway to California, so some of the issues that we have encountered in getting that pathway have been overcome. Pfennig commented that the main part of your project here is the fish meal and asked is getting the approval from EPA critical to your project's success or is it secondary. Because your primary objective is to make the fish meal. Dunlop replied that in terms of value of the product, the fish meal is much higher than the alcohol. There is the question of what the renewable energy standard is going to be long-term. He wouldn't say it hinders the project to the point where you wouldn't move forward, but certainly adds a value to the product if we can get to the advanced biofuels. Zueger

further clarified that they anticipate that they would get a pathway to produce RINS as qualified gallons which is whether it is conventional or advanced. That would be the financial implications.

Nisbet asked how much of a value swing there is between the advanced and conventional on the RINS. Zueger replied that the RINS is one component. There is a differential between the conventional and the advanced. We can just call an average of ten cents a RIN. If it carries with it a low carbon component score there is inherent value in that. There are two layers of value that get created.

### ADMINISTRATIVE BUSINESS

There was no other business.

### COMPLETION OF BALLOTS

R037-A: "Barley Protein Concentrate"

Fund: 7

No: 0

There was one conflict of interest.

### ADJOURNMENT

Meeting adjourned at 2:18 p.m.

*for*  10/10/18  
Jay Schuler Date  
Chairman

 10/10/18  
Denise Faber Date  
Acting Recorder