

Renewable Energy Program

Application

Project Title: North Dakota Soybean Processors:

Phase 1 Engineering

Applicant: North Dakota Soybean Processors

Principal Investigator: Scott Austin

Date of Application: August 3, 2017

Amount of Request: \$500,000

Total Amount of Proposed Project: \$8.5 Million

Duration of Project: 24 Months to Build.

Point of Contact (POC): Scott Austin

POC Telephone: 701-368-3131

POC Email: scott.austin@mnsoy.com

POC Address: 120 2nd St. SE Jamestown ND

North Dakota Industrial Commission

TABLE OF CONTENTS

Please use this table to fill in the correct corresponding page number.

Abstract	3
Project Description	4
Standards of Success	9
Background/Qualifications	10
Management	11
Timetable	12
Budget	13
Confidential Information	13
Patents/Rights to Technical Data	14

ABSTRACT

Objective: North Dakota Soybean Processors, LLC plans to construct and operate a state of the art fully integrated soybean processing facility in East Central North Dakota (NDSP). The NDSP facility at Spiritwood, North Dakota will consist of a soybean crushing plant with a yearly capacity of 42.5 million bushels of soybeans (125,000 bushels per day), a biodiesel refining and bleaching plant with a yearly capacity of 35 million gallons (800,000 pounds of soybean oil equivalent daily) and a food grade deodorization plant with a yearly capacity of 200 million pounds (600,000 pounds of soybean oil equivalent daily). The biodiesel facility will produce Canadian spec biodiesel that will also qualify that product to go to California. NDSP will be the second biodiesel facility in North Dakota and the first to run off of Soybean oil. With a production of 35 million gallons NDSP expects to serve markets both in North Dakota and in the Western US and Canada.

North Dakota currently produces around 250 million bushels of soybeans per year...a significant majority of which are exported out of the state without any processing. Of this approximately 42 million bushels are grown in the three counties nearest to the proposed plant, Stutsman, Barnes and La Moure...and that is enough to run the entire plant for one year. NDSP does not expect, of course, to get all of the soybeans grown in these three counties, but it does provide an indication of bean availability in our area. The plant will target a sourcing radius of approximately 100 miles around the plant.

The purpose of this Phase 1 project is to perform engineering work prior to and during construction of the plant.

Expected Results: The results of the Phase 1 project will be the completion of detailed engineering

drawings. Once the plant is operating, the company expects to generate

approximately \$600 Million in annual revenue and a net income of

approximately \$10-15 Million per year.

Duration: It is the intent of NDSP to operate in perpetuity.

Total Project Cost: Phase 1 project cost is \$8.5 Million. The entire project cost will be

approximately \$287 Million

Participants: Minnesota Soybean Processors (MNSP) will be the majority owner of NDSP.

PROJECT DESCRIPTION

Objectives: North Dakota Soybean Processors, LLC (NDSP) is preparing to construct, own, and operate a Soybean processing facility in East Central North Dakota. The facility will be located in the Spiritwood Energy Park Association (SEPA) a Stutsman County industrial park, just south of the town of Spiritwood, and approximately twelve (12) miles Northeast of the city of Jamestown, North Dakota. The project site is bound by 93rd Avenue SE on the East and is adjacent to a rail loop owned by SEPA, directly to the Northwest. The property is currently used for agricultural purposes.

The objective of the plant is to be the first biodiesel facility in North Dakota to utilize soybean oil as its feedstock and to produce Canadian spec biodiesel so that the company can export that biodiesel to Canada and also sell into renewable fuels markets in California and the Pacific Northwest.

The purpose of this Phase 1 project is to perform engineering work prior to and during construction of the plant. Phase 1 of the project involves detailed engineering design including:

- 1. Process/Mechanical Engineering
- 2. Civil Engineering:
- 3. Structural Engineering:
- 4. Electrical Engineering

Methodology:

This soybean processing plant utilizes proven technology and will be constructed by the design build team of Karges-Faulconbridge Inc. (KFI) and McGough Industrial Construction LLC who have partnered together for several previous design/build facilities oilseed processing facilities. The plant operational equipment is designed and built by Crown Iron Works Inc. (CWIW), proven providers of quality oilseed crushing and refining equipment for many years.

This Phase 1 project will include the detailed engineering for the plant and will involve the following tasks:

- 1. Process/Mechanical Engineering
 - a. Design of hexane and methanol unloading and storage, and design of skim pit for Extraction, Refinery and Biodiesel.
 - b. NFPA 30 code review for Biodiesel area.
 - c. Design criteria and calculations required by NDSP for their PSM documentation
- 2. Civil Engineering:
 - a. Prepare the erosion control plan, and storm water pollution prevention plan (SWPPP) and coordinate these efforts with local Watershed, as required.
 - b. Assist with the preparation of the spill preparation controls and countermeasures plan (SPCC).
- 3. Structural Engineering:

a. Structural design of building footings/foundations, tank foundations, cooling tower foundation, skim pits, truck/rail load out station foundations, stack foundations, pipe/conveyor bridges foundations, and all equipment foundations, base plate, or pad designs

4. Electrical Engineering

- a. Provide design of plant electrical power, grounding, lighting, fire alarm and ancillary electrical systems.
- b. Design heat trace systems for piping and equipment per the PID's.

Project Description

The property is planned to be accessible by truck and car from two access points from 93rd Avenue SE. Employee and delivery traffic will be served by the North entrance. Truck traffic for soybean deliveries, product and byproduct sales as well as chemical deliveries will use the South entrance. It is anticipated that a majority of the soybeans processed will arrive by truck and a majority of the products and byproducts produced will be shipped by rail. Rail service will be obtained through access to an existing rail loop and BNSF mainline switches owned by SEPA and shared with other tenants.

The project has been designed to process a nominal 3,750 tons of Soybeans per day. Major process areas will include Soybean Receiving and Storage, Preparation and Extraction, Soybean Oil Refining, Biodiesel Production, and Product and Byproduct Storage and Load-out.

Electricity and potable water will be provided by local utilities. Medium pressure process steam will be provided by a coal fired power plant, adjacent to the facility. Compressed air, nitrogen, fire water, and other utilities will be provided by on site facilities.

Soybean Receiving/Storage

The Soybean receiving and storage system will include provisions for both truck and rail Soybean receiving, 3,800,000 bushels of soybean storage in four (4) vertical corrugated steel bins. Soybeans will be received via dedicated inbound and outbound truck scales, two (2) dedicated truck unloading bays and one (1) combination rail/truck unloading bay with high capacity hoppers and drag conveyors. Automated sample probes will collect samples from the inbound Soybean trucks, which will be processed in an on-site grain grading lab. Total receiving capacity will be 50,000 bushels/hour. Soybeans will be transferred from receiving to the storage bins and from the storage bins to the Preparation Building via bucket elevators and drag/belt conveyors. All equipment in soybean receiving and meal load-out will be equipped with aspiration systems.

Meal Storage/Load-out

Meal will be conveyed from the Preparation Building to concrete storage silos via bucket elevators and drag conveyors. The meal storage will consist of 8,000 tons of meal storage in two (2) vertical concrete meal silos with conventional mechanical bottom unloaders. Meal load-out will include provisions for both truck and rail loading. Rail loading will include two (2) dedicated rail load-out spots with overhead scales and sufficient capacity to enable unit train loading.

Soybeans will primarily be received by truck at this facility but rail receiving will be an option utilizing a combination rail / truck unloading area. The soybeans will be received over two dedicated scales (one inbound one outbound) and unloaded at two dedicated soybean truck unloading pits. High speed conveying will be used to move these soybeans into four large corrugated steel tanks which will hold a total of approximately 3.8 million bushels of soybeans. Typical sampling and grading processes take place prior to the soybeans being unloaded.

Preparation and Extraction

The soybean crushing operation uses a preparation and extraction method of processing. In the preparation stage, the soybeans are conditioned, cracked and flaked to be optimally ready for exposure to solvent in the extraction area. During the prep process, the soybean hull is separated, using aspiration, from the balance of the soybean which is then flaked. The soybean hulls are ground and pelletized for eventual shipment as a high fiber source for animal feed. The soybean flakes, once fully prepared, are sent from the preparation building to the extraction building where they will be exposed to the solvent (hexane) to remove the soybean oil stream from the flake. The soybean flake then travels to the desolventizer-toaster-drier-cooler (DTDC) where the solvent is removed from the flakes as the flakes are toasted. The flakes are dried and cooled before they are shipped back into the preparation building where they will be ground and screened into soybean meal. This meal is then ready for shipment to customers. The soybean oil stream is sent into the distillation process where the oil, water and solvent are separated recycling the oil and water using a continuous distillation process. The crude soybean oil is then ready to be degummed or further processed as soy methyl ester (biodiesel) or refined oil and shipped to customers.

Refining, Bleaching, and Deodorizing (RBD) Refinery

The Refining process is designed by Crown Iron Works and will process the crude Soybean oil into food-grade vegetable oil with three separate stages: neutralizing, bleaching and deodorizing. Neutralizing consists of caustic refining to separate the light (oil) phase from the heavy (soapstock) phase using a centrifuge. The once-refined (OR) oil can be pumped to storage and sold or further refined, while the soapstock can be sold as a byproduct or added back into the meal to increase the meals energy content.

Once-refined oil is bleached by making a slurry of OR oil and bleaching agent and pumping the slurry through a pressurized leaf filter. The RB oil can be pumped to storage and sold or further refined. RB oil is deodorized under vacuum in the deodorizer, cooled, pumped to storage and sold as RBD oil. The distillate from the deodorization process can be pumped to storage and sold as a bi-product.

Biodiesel Production

The continuous methyl ester transesterification (biodiesel) process is designed by Crown Iron Works, and will utilize a two-step transesterification process using a sodium methoxide catalyst and methanol to promote the nearly full conversion of the triglycerides in the feed to biodiesel. The biodiesel is then washed with acid and water. The residual methanol is removed from the biodiesel and glycerin product

streams so that it can be recycled to the transesterification process. The purified water is also reused in the wash process. The biodiesel is then filtered and sent to storage.

Anticipated Results:

Phase 1 of the project will provide detailed engineering drawings including:

- 1. Detailed engineering Drawings
- 2. General Arrangement Drawings
- 3. Finalized Process and instrumentation Drawings
- 4. Structural Drawings
- 5. Shop Drawing reviews
- 6. Construction Administration
- 7. Equipment list
- 8. Instrument list

When finished, the NDSP facility at Spiritwood, North Dakota will have a crushing capacity of 42.5 million bushels of soybeans (125,000 bushels per day), a biodiesel refining and bleaching plant with a yearly capacity of 35 million gallons (800,000 pounds of soybean oil equivalent daily) and a food grade deodorization plant with a yearly capacity of 200 million pounds (600,000 pounds of soybean oil equivalent daily). The biodiesel facility will produce Canadian spec biodiesel that will also qualify that product to go to California.

The company anticipates revenues of around \$600 Million per year with Net Income of approximately \$10-15 Million per year when fully operational.

Facilities:

See Methodology above. Plant layout attached.

Resources:

Techniques to Be Used, Their Availability and Capability:

See Methodology. The technology is available and well known.

Environmental and Economic Impacts while Project is Underway:

A technology process study was completed by KFI regarding multiple facets of the new facility. A number of assessments were included in this study including: environmental site assessment, air permitting, wetlands review, zoning and building permit review, overall construction permitting as well as a site survey. This study showed no areas of significant concern that would impede the project.

Ultimate Technological and Economic Impacts:

Ultimately the new facility will produce up to 35 million gallons of biodiesel per year for use in North Dakota as well as for export outside the State. In addition to the economic results that the plant expects

to achieve, the local area, within an approximately 100 mile radius, may see a better return to local growers who will have a local market for their beans rather than having to transport them greater distances. The economic impact of 55 additional jobs in the local area will also be a key outcome of the project. Please see the table below with a list of jobs to be added. Finally with the availability of readily available soybean meal the local area may see a renewed interest in raising chicken and hogs, two key applications for soybean meal.

		Hourly or Annual
Job Title	# Hired	Salary
Plant Manager	1	125 K
Production Manager	1	75k-80k
Controller	1	60k-70k
Maintenance		
Manager	1	60k-70k
Commodity Manager	1	60k-70k
CMO	1	55k-70k
Lab/Quality Manager	1	65k-75k
Supervisors	4	40k-60k
Admin Clerk	1	12-14
Accounts Payable		
Clerk	1	12-14
Invoicing Clerk	1	12-14
Shift Operators	22	14-16
Load Out/ Rec	7	14-16
Electrician	1	20
Rail Tech	1	14-16
Janitor	1	12-14
Shift Maintenance	4	16-18
Allied Trades Tech	1	18-20
Merchandiser	1	40k-50k
EHS	1	55k-70k
Maint Clerk	1	12-14
IT	1	55k-70k

55

Why the Project is Needed:

This project is needed because proper engineering design is fundamental to the successful construction of the plant. There is only one biodiesel facility in North Dakota and it utilizes canola oil as its feedstock.

The NDSP facility will run off of Soybean oil. Additionally at the present time a great majority of the soybeans grown in North Dakota are exported out of the state. This project will enable the value added of those beans to occur within North Dakota.

STANDARDS OF SUCCESS

The success of the Phase 1 project will be measured by the following key metrics:

- 1. Engineering: Delivery of:
 - A. Detailed engineering Drawings
 - B. General Arrangement Drawings
 - C. Finalized Process and instrumentation Drawings
 - D. Structural Drawings
 - E. Shop Drawing reviews
 - F. Construction Administration
 - G. Equipment list
 - H. Instrument list
- 2. Once the plant is operational, key success metrics will include:
 - A. Bushels processed: the plant is expected to process approximately 125,000 bushels per day.
 - B. Revenue: revenue at full production is expected to be approximately \$600 Million per year.
 - C. Net Income: net income is expected to be approximately \$10 15 Million per year.

There will be a number of values that accrue to North Dakota from the building and operation of the NDSP plant. In particular:

- 1. NDSP will create 55 quality, full time jobs in Spiritwood ND.
- 2. NDSP will enable growers within a 100 mile radius of the plant to deliver their beans to a nearby facility for processing.
- 3. North Dakota will benefit, through NDSP, by participating in the value added of its locally grown soybeans.
- 4. Other North Dakota businesses will benefit by having a local source of soybean oil, meal and biodiesel.

The potential for commercial use is 100% as the company will be a for-profit processing facility selling 100% of its production commercially.

The overall project will enhance the marketing of North Dakota's renewable energy resources by utilizing a resource that is currently not used to make renewable fuel: that is soybeans and soybean oil. This should pave the way for additional R&D in the biodiesel arena.

The project will meet the following additional stated goals of the program:

- Promote efficient, economic and environmentally sound development and use of North Dakota's vast renewable energy resources, particularly in the areas of wind energy, biofuels (ethanol & biodiesel), and biomass.
- Ensure economic stability, growth and opportunity in the renewable energy industry.

- Promote public awareness of the benefits and opportunities provided by North Dakota's renewable energy industries.
- Add wealth for landowners and agriculture producers to build and maintain a robust rural economy.
- Ensure economic stability, growth and opportunity in the renewable energy industry.
- Maximize the market potential for renewable energy resources and the associated byproducts produced therewith.
- Develop baseline information that will lead to other projects, processes, ideas, and activities

BACKGROUND/QUALIFICIATIONS

Minnesota Soybean Processors (MnSP) based in Brewster, MN formed NDSP to construct a state of the art fully integrated soybean processing facility in East Central North Dakota. NDSP is a North Dakota LLC. MnSP has owned and operated a soybean processing and biodiesel manufacturing facility in Brewster, MN since its construction in 2003. MnSP personnel in Brewster in conjunction with the Northern Ag Commodity Consulting (NACC) MnSP subsidiary in Omaha NE will commercially manage both facilities. The plants are designed to operate on a 24/7 basis. The capability of the NACC personnel to utilize their expertise in optimizing gross margins across both facilities by trade, arbitrage, business intelligence and outstanding customer service will provide great value for both the company and stockholders.

This soybean processing plant utilizes proven technology and will be constructed by the design build team of Karges-Faulconbridge Inc. (KFI) and McGough Industrial Construction LLC who have partnered together for several previous design/build facilities oilseed processing facilities. The plant operational equipment is designed and built by Crown Iron Works Inc. (CWIW), proven providers of quality oilseed crushing and refining equipment for many years.

Scott Austin will serve as CEO of North Dakota Soybean Processors. Since January 2015, Scott Austin has served as the general manager for Minnesota Soybean Processors and is responsible for all operational and financial aspects of the company. MnSP is a \$500 million company producing soybean meal, oil and biodiesel as well as several other commodity products. MnSP's meal and oil products are marketed globally, both direct to end users and through distributors. MnSP is a vertically integrated company that handles all marketing, sales, logistics and finance functions internally. MnSP is one of the largest standalone soybean crush facilities in the U.S.; crushing more than 3300 MT of soybeans per day. MnSP employs 87 management and staff.

Mr. Austin's career experience spans over 25 years of leadership and operations management. Through that time he has worked in three main industries, and nine years in the U.S. Army as a commissioned officer. In that role, Mr. Austin served in various front line leadership and staff positions at the company, battalion and brigade levels. Mr. Austin's key positions were as Company Commander and Brigade Chief of Training and Operations.

After the military Mr. Austin spent 6 years as a plant manager in the chemical/plastics industry producing consumer goods. During that time, he managed organizations as large as 400 people and

global operations in Central America and Asia. Through this time he developed a skill for turning non-profitable operations into financially stable, profitable industry leaders.

For the last 10+ years Mr. Austin has worked in the agricultural industry, managing start-up ethanol facility, selling management information systems to Ag processors and advising on grain procurement and risk management strategies. Mr. Austin also served as a senior VP of operations and regional GM for a medium sized manufacturer of liquid CO2. In this role, he prepped the company for sale by restructuring operations, developing regulatory compliance structure and financial due diligence.

Mr. Austin's experience includes working in large publically traded Fortune 500 companies (Tyco & DuPont /Pioneer) as well as large privately held companies (Johns Manville). In his current role, and as an ethanol plant GM for Northstar Ethanol (dba Poet Biorefining, Lake Crystal), Mr. Austin reported directly to the board of directors giving him small company LLC and Cooperative experience.

Mr. Austin received an MBA from the University of St. Thomas, MN and a BS in Biology from Northern Kentucky University. Mr. Austin's training includes Six Sigma Black Belt and Champion training through Tyco's certification program. Mr. Austin has earned the Lean Process Management Certification.

Rob Carstensen will serve as CFO of North Dakota Soybean Processors. Since April 2008 Robert Carstensen has served as an accountant for Minnesota Soybean Processors. Robert started out as a financial analyst and has worked his way up to the Accounting Manager role in the organization. Roberts's duties include preparing monthly financials in accordance with GAAP accounting, analyzing the financial impact of prospective projects, overseeing the accounting for receivables and payables. Robert reports directly to the general manager as well as the board of directors. Robert is also responsible for the annual audit preparation.

Mr. Carstensen spent 5 years as a public accountant prior to working for Minnesota Soybean Processors, where his responsibilities included preparing individual and corporate tax returns, bank exams, and governmental audits. Mr. Carstensen received a Bachelor of Science in Accounting from Colorado Technical University.

MANAGEMENT

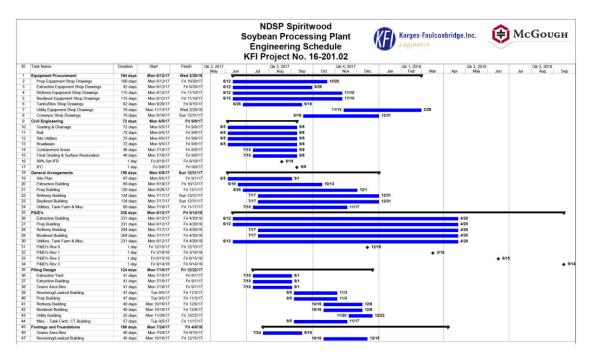
Overall engineering will be performed by KFI under the management of NDSP. During construction McGough and KFI will have overall management responsibility, reporting to NDSP who will have an onsite project manager as well as on-going interaction with the company's General Manager. The project, both engineering and construction, will have weekly project reviews to make sure that everything stays on track and on time. During operations the plant will be run by an on site plant manager with many administrative and marketing functions being handled by the staff at MNSP.

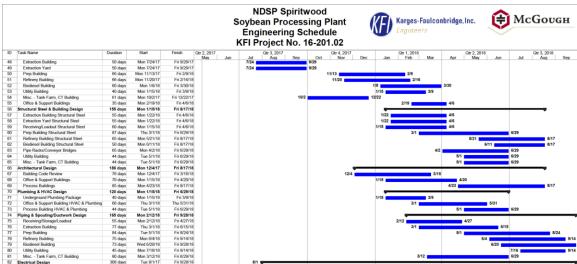
During construction there will be a full project management schedule that will be adhered to with operations commencing approximately 24 months after construction begins. During the course of operations the company will monitor its production and financial results as a way of evaluating the

project. In particular the company will monitor the amount of soybeans processed on a monthly and annual basis and the amount of meal, oil and bio-diesel that the plant produces monthly and annually.

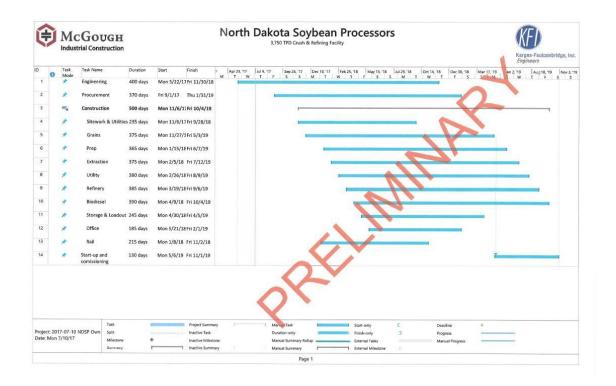
TIMETABLE

Below is an initial proposed engineering schedule for the project. Please note that there is engineering that will be going on during the construction phase of the project.





What follows is an overview schedule for the entire project.



BUDGET

The Phase 1 Engineering budget is:

Engineering Area	Budget
Process/Mechanical Engineering	\$5.5 Million
Structural Engineering	\$3.0 Million
Electrical Engineering	\$1.7 Million
Civil Engineering	\$1.5 Million
Total Engineering Budget	\$12.7 Million

We would anticipate using the NDIC's grant funds toward the process/mechanical engineering aspect of the project.

CONFIDENTIAL INFORMATION

Any information in the application that is entitled to confidentiality and which the applicant wants to be kept confidential should be placed in an appendix to allow for administrative ease in protecting the information from public disclosure while allowing public access to the rest of the application. Such information must be clearly labeled as confidential and the applicant must provide the following information: (a.) a general description of

the nature of the information sought to be protected, (b.) an explanation of why the information derives independent economic value, actual or potential, from not being generally known to other persons, (c.) an explanation of why the information is not readily ascertainable by proper means by other persons, (d.) a general description of any person or entity that may obtain economic value from disclosure or use of the information, and how the person or entity may obtain this value, and (e.) a description of the efforts used to maintain the secrecy of the information. If there is no confidential information please note that below.

Not applicable.

PATENTS/RIGHTS TO TECHNICAL DATA

Any patents or rights that the applicant wishes to reserve must be identified in the application. If this does not apply to your proposal, please note that below.

Not applicable.





Andrea Holl Pfennig
Program Manager
North Dakota Department of Commerce
P.O. Box 2057
Bismarck, ND 58502-2057

Dear Andrea,

Great River Energy supports the North Dakota Soybean Processors (NDSP) processing facility planned at the Spiritwood Energy Park and its request for grant funding from the Renewable Energy Council.

Great River Energy has been part of the Stutsman County and Jamestown-Spiritwood communities for the past ten years through the building of the Spiritwood Station CHP facility, the Dakota Spirit AgEnergy biorefinery and the Spiritwood Energy Park. With this new NDSP plant, over \$800 million in projects and infrastructure will be invested.

The Spiritwood Energy Park Association, a public-private partnership, welcomed its first tenant, Dakota Spirit AgEnergy a few years ago. The addition of this second tenant will strengthen the Spiritwood Energy Park and enable lower operating costs for both tenants.

The Great River Energy board of directors has approved up to \$20 million for the installation of the thermal energy infrastructure that will supply steam to NDSP from its Spiritwood Station combined heat and power plant. With this third steam user, Spiritwood Station will attain maximum efficiency on the energy it produces.

The addition of the soybean crushing facility is yet another example of the synergies with agriculture and energy working together to strengthen the regional and state economy. The partnerships with and support from state and local partners is integral in developing these type of projects that benefit the entire state.

Thank you for the opportunity to provide this letter of support for the North Dakota Soybean Processors crushing facility at Spiritwood Energy Park.

Regards

Mark Fagan

VP, Business Development & Strategy





September 22, 2017

Andrea Holl Pfenning, Program Manager ND Department of Commerce PO Box 2057 Bismarck ND 58502-2057

Dear Andrea:

North Dakota Farmers Union (NDFU) represents more than 47,500 farm and ranch families and their energy and agriculture supply cooperatives. We are the largest general farm organization in North Dakota.

On behalf of the members of NDFU, I am writing to support the North Dakota Soybean Processor (NDSP) crushing facility planned at the Spiritwood Energy Park and its request for grant funding from the Renewable Energy Council.

We have supported the installation of the Great River Energy thermal energy infrastructure at the Spiritwood Station and believe the addition of NDSP would only strengthen the Spiritwood Energy Park, and allow for lower operating costs for the Spiritwood CHP facility, Dakota Spirit AgEnergy biorefinery and the Spiritwood Energy Park.

The addition of the soybean crushing facility at the Spiritwood Energy Park is a prime example of agriculture and energy working together to strengthen the regional and state economies. These projects, with support from state and local partners, are integral in developing ventures that benefit the entire state.

The members of NDFU and family farmers and ranchers across North Dakota are excellent producers. Our state needs more processing facilities rather than additional production. This soybean facility is a perfect fit. We encourage more facilities of this kind to this to utilize our commodity production.

Thank you for your consideration.

Respectfully,

NORTH DAKOTA FARMERS UNION

Mark Watne

Mark Watne President