North Dakota Transmission Authority

North Dakota Industrial Commission

# BIL 40101(d) Application

Project Title: Merricourt Area Sub-Transmission Upgrades

Applicant: Montana-Dakota Utilities

Date of Application: 1 June 2025

Date of Application Revision: N/A

Amount of Grant Request: $2,800,000

Total Amount of Proposed Project: $7,455,000

Duration of Project: 27 Months

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# Applicant Description

*Montana- Dakota Utilities Co. (MDU), a 100-yr vertically integrated northern great plains electric utility, currently serves 145,000 customers across four states (ND, SD, MT, and WY). MDU has extensive experience designing, permitting, and constructing transmission projects and has established policies, procedures, work methods and standards to effectively plan, manage and execute the proposed work. MDU focuses on minimizing risk while containing costs without compromising quality.*

# Project Description

*Background*

*MDU operates a 46 kilovolt (kV) sub-transmission system to serve smaller communities and rural areas across North Dakota. This sub-transmission system is served from transmission substations connected to the bulk electric, above 100 kV, transmission system. These transmission substation sources can be located far apart, resulting in long 46 kV lines. One area lies between Wishek and Ellendale. The Wishek to Ellendale sub-transmission system serves the communities of Ashley, Fredonia, Kulm, Lehr, Merricourt and Venturia. Several rural electric cooperative (REC) loads are also served by this sub-transmission system.*

*MDU currently owns and operates the Merricourt Transmission Substation located between Wishek and Ellendale on MDU's 230 kV transmission system. The Merricourt Transmission Substation was constructed for a wind farm interconnection but has the capability for expansion. MDU has plans to construct a 230/46 kV addition to the Merricourt Transmission Substation to interconnect two new 46 kV sub-transmission lines, providing an additional transmission source to the Wishek to Ellendale sub-transmission system. The new 46kV lines will be routed from the Merricourt Transmission Substation generally north to Hwy 13*

*(Merricourt-Fredonia 46 kV line) and generally south to Hwy 11 (Merricourt-Ashley 46 kV line), connecting to the existing Wishek to Ellendale 46 kV lines.*

*The purpose of this project is to improve reliability of the sub-transmission system in this area. By constructing new lines from a source in the center of the system, reduces circuit miles under normal conditions and offers the flexibility of additional sources during emergencies. This reduces outage frequency and outage duration to North Dakota citizens in this area, improves service, and allows for future load growth and development. MDU is requesting funding in this grant application for the Merricourt to Fredonia 46 kV line project.*

*The new Merricourt to Fredonia 46 kV line will be of monopole design utilizing horizontal line post insulators and a pole tope shield wire. Horizontal line post insulators eliminate the need for crossarms and bracing. Crossarms are more susceptible to breaking under ice load and during storm events. Crossarms also provide avian perch locations that can cause additional outages and possible raptor takings. Shield wire improves line performance during lighting storms, reducing momentary customer outages due to lightning strikes. The existing lines were not originally constructed with a shield wire, exposing the upper phase conductor to lightning.*

*<u>Project Tasks</u>*

*Route Selection*
*MDU's routing criteria for sub-transmission lines is to parallel existing section lines, township roads, or county highways. This reduces the impact to property owner's development or farming operations and simplifies access for future construction and maintenance activities. Meetings are conducted with property owners and local, state, or federal government entities. These meetings are to gather feedback on route selection and determine requirements of the project. MDU performs desktop reviews and in-field surveys to identify and avoid any environmental or culturally sensitive areas. All this information is then compiled to identify the shortest route possible.*

*Easement Acquisition*
*Easement acquisition involves negotiations with property owners to obtain land rights to locate the project on their property. Land rights required are permission to survey, electric line easements, and possible access easements. The easements are acquired by providing just compensation to the property owner and added to the public record.*

*Engineering & Design*
*Transmission line design and engineering runs concurrently with route selection, as both tasks must take into account landowner input, environmental considerations, other infrastructure, terrain, wetlands, residences and land use. The design is also verified with applicable engineering standards and codes.*

*Material Procurement*

*Once a preliminary design is complete and a route secured, material items are ordered for the project. Some material items may have lead times of 12 months, delaying project construction.*

*Construction*
*Construction of a new transmission line of this size and length has a typical duration of 6 to 12 months. The schedule is dependent upon weather conditions, permit requirements, or road and railway crossings. MDU typically hires contractors for construction, which requires outside the area manpower, increasing economic activity during the construction period.*

*Commissioning*
*Substation commissioning activities to test line protection and control components, circuit breakers, and other substation components. Verify phasing of the new transmission line and the connections to the substation and existing sub-transmission system.*

## Standards of Success

*The success of this project will be measured by the decrease in SAIDI, SAIFI and CAIDI improvements for MDU customers in Fredonia, Lehr, Kulm and Merricourt. Performance data will be compared before project completion and after project completion. Based on similar projects in other areas of MDU's system, we expect a significant reduction in these metrics.*

*MDU is also in the process of implementing a Distribution SCADA system and an Outage Management System. The addition of this system will enable the company to compile more accurate reliability indices. The enhanced view MDU will have of its system operations can further pinpoint reliability needs and the benefits received from projects of this type.*

**IEEE Indices Report**

| MED | Network | Cause Category | Cause Detail | Detail Subtype | Start Date | End Date |
|---|---|---|---|---|---|---|
| city | None | | | | 1/1/2024 0:00 | 12/31/2024 12:59 |

| Level | CAIDI | CAIFI | SAIDI | SAIFI | MAIFI | CI | CMI | CTADI | MI | N | NI |
|---|---|---|---|---|---|---|---|---|---|---|---|
| system | 101.073 | 1.409 | 54.512 | 0.54 | 2.433 | 87240 | 8817626.101 | 142.45 | 392527 | 162635 | 61900 |
| Fredonia, ND | 111.583 | 2 | 223.167 | 2 | 18 | 122 | 13613.167 | 223.167 | 1083 | 61 | 61 |
| Lehr, ND | 62.375 | 2 | 124.75 | 2 | 16 | 266 | 16591.75 | 124.75 | 2139 | 135 | 133 |
| Merricourt, ND | | | | 0 | 17 | 0 | | | 68 | 4 | |
| Kulm, ND | | | | 0 | 16.994 | 0 | | | 5693 | 338 | |

*In addition to IEEE Indices monitoring to measure customer service, we will also gain microprocessor-based relaying on the source 46kV breaker at Merricourt. The micro-processor devices provide accurate distance to fault and fault type data, which significantly reduces line patrol times and faster transmission line restoration. The fault location data is automatically sent to MDU's control center, who then relay that location to field personnel who can drive*

*directly to that location to remedy the cause of the fault. Future capital projects will add fault location capabilities to the Ellendale and Wishek sources as well.*

## Project Timeline

*Major project milestones listed below.*

*Project kick-off – August 2025*
*Preliminary Route Investigation – September 2025*
*Easement Acquisition - September 2025 to December 2026*
*30% Line Design Milestone – 30 Nov 2025*
*LiDAR and Survey Data Acquisition – October 2025 to November 2025*
*4th Qtr Report Submission for 2025 – Jan 2026*
*1st Qtr Report Submission for 2026 – April 2026*
*2nd Qtr Report Submission for 2026 – July 2026*
*60% Design Milestone – 30 August 2026*
*3rd Qtr Report Submission for 2026 – October 2026*
*Material Procurement – January 2026 to November 2026*
*Contractor Bidding and Award – Oct 2026 to November 2026*
*4th Qtr Report Submission for 2026 – Jan 2027*
*Transmission Line Construction – December 2026 to September 2027*
*1st Qtr Report Submission for 2027 – April 2027*
*2nd Qtr Report Submission for 2027 – July 2027*
*Testing and Energization – Oct 2027*
*3rd Qtr Report Submission for 2027 – Oct 2027*
*In-service Milestone – Dec 2027*
*Final Report Submission – Jan 2028*

## Project Budget

*The project budget is itemized by the project tasks listed in the Project Description Section above. Direct costs, salaries, material, consultant and contractor costs are within these cost items. The Cost Share Request is a percentage of all project tasks.*

| Project Associated Expense | NDIC Grant | Applicant's Share (Cash) | Total |
|---|---|---|---|
| Easement Work | $570,000 | $970,000 | $1,540,000 |
| LiDAR & Survey | $67,000 | $113,000 | $180,000 |
| Design Engineering | $78,000 | $132,000 | $210,000 |
| Material | $785,000 | $1,415,000 | $2,200,000 |
| Construction | $1,300,000 | $2,025,000 | $3,325,000 |
| | | | |
| **Total** | $2,800,000 | $4,655,000 | $7,455,000 |

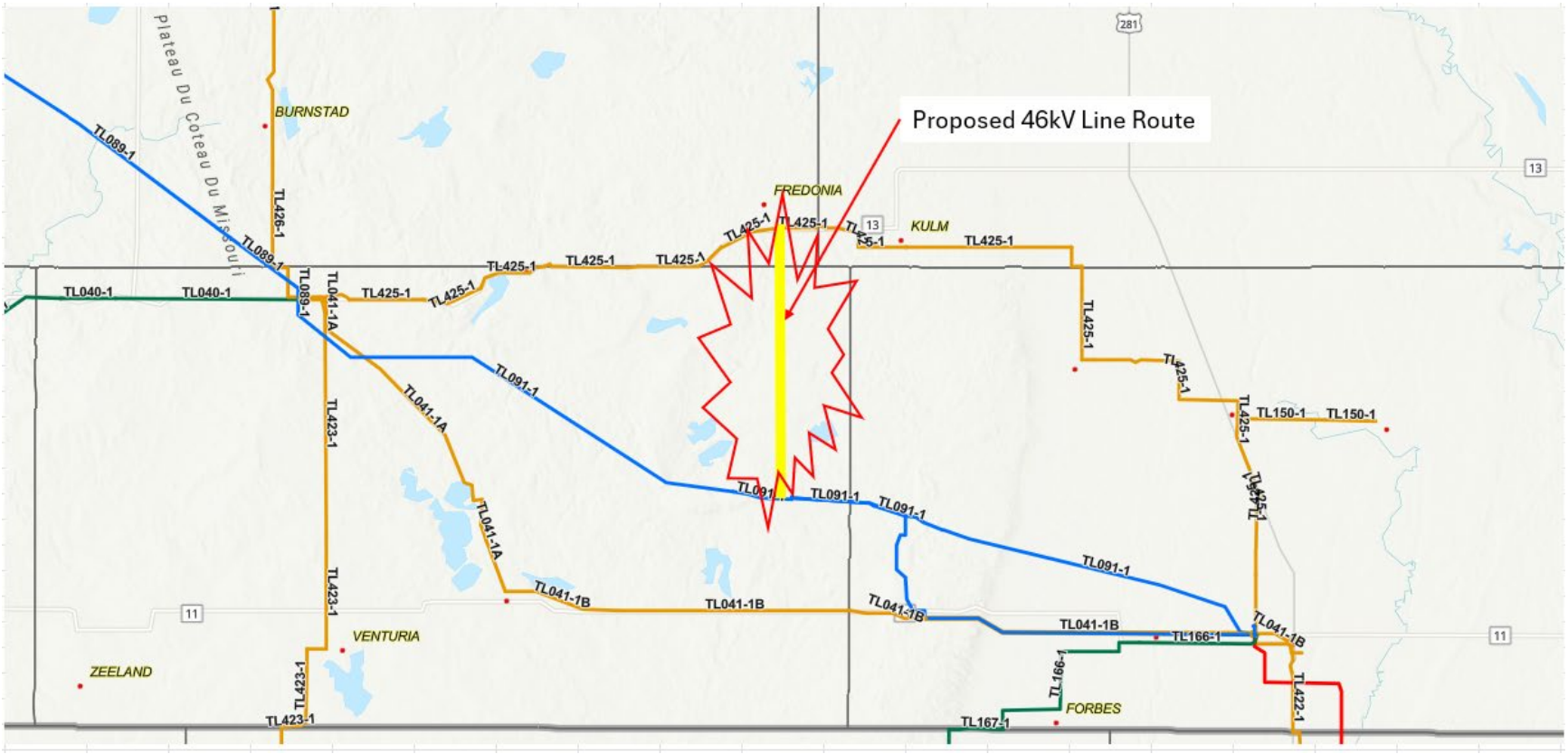


Exhibit A - Location Map of proposed 46kV Transmission Line