

Before the Public Service Commission  
of  
The State of North Dakota

In the Matter of the Application of  
BASIN ELECTRIC POWER COOPERATIVE

Consolidated Application to the North Dakota Public Service Commission for a  
Certificate of Corridor Compatibility and Route Permit  
Pioneer Generation Station to Judson Substation 345-kV Transmission Line Project  
Williams County, North Dakota

Case No. PU-23-338

Pre-filed Testimony  
of  
Bobby Nasset

**I. Introduction**

**Q.1. Please state your name, business address, and your occupation.**

A.1. My name is Bobby Nasset. I am employed as a Senior Civil Engineer for Basin Electric Power Cooperative, 1717 East Interstate Avenue, Bismarck, North Dakota.

**Q.2. Please state your educational and professional background.**

A.2. I received a bachelor's degree in Civil Engineering from North Dakota State University in 2005. I am a licensed professional engineer in North Dakota.

**Q.3. What is your employment history and work experience with Basin Electric?**

A.3. I have been employed with Basin Electric for eight years and 18 years as a civil engineer. My experience includes the routing, design, and construction administration of numerous high voltage transmission projects throughout the Midwest and design support for operations and maintenance of existing transmission lines.

**Q.4. What have been your responsibilities in connection with the Pioneer Generating Station (PGS) to Judson Transmission Project (Project)?**

A.4. I am the Project Coordinator and member of the design team. I am responsible for coordination of budgeting, scheduling, routing, right-of-way acquisition, engineering, permitting and construction.

**Q.5. Before we discuss the Project, would you please describe Basin Electric?**

A.5. Basin Electric is a regional wholesale electric generation and transmission cooperative organized under the laws of the State of North Dakota, and headquartered in Bismarck, North Dakota. Basin Electric provides power to 141 member cooperatives serving three million consumers.

**Q.6. What areas do Basin Electric members serve?**

A.6. Basin Electric has members in nine states: North Dakota, South Dakota, Nebraska, Montana, Minnesota, Iowa, Colorado, Wyoming and New Mexico, with a service territory comprising 550,000 square miles.

Q.7. **Who controls Basin Electric?**

A.7. Basin Electric and its member systems are owned by the members at the end of the line. Each of our Class A members has one seat on the 11- member Board of Directors.

Q.8. **What are the business principles on which Basin Electric operates?**

A.8. Basin Electric follows the cooperative business model, embracing the seven cooperative principles: open and voluntary membership; democratic member control; members' economic participation; autonomy and independence; education, training, and information; cooperation among cooperatives; and, concern for community. Basin Electric pursues a smart and affordable energy strategy, and takes advantage of the benefits of renewables while maintaining baseload that ensures the reliability our members expect. Basin Electric's margins must be used to improve or maintain operations, set aside in reserves, or distributed to the membership.

Q.9. **What will you discuss in your testimony today?**

A.9. In my testimony I will describe the Project design and construction as well as the work Basin Electric performed to comply with the Commission's policy criteria.

## II. **Project Description**

Q.10. **Would you please describe the various people or groups of people that are assisting with the Project?**

A.10. Basin Electric has assigned internal team leads in engineering, environmental/permitting, surveying, right-of-way, legal, procurement, communications and construction management. We have also contracted with ROW and environmental consultants for the Project.

Q.11. **Please provide a general description of the Project.**

A.11. The Project is an approximately 14.6-mile-long electric transmission line built within a 150-footwide easement. A single-circuit connection will run from the Pioneer Generation Station Switchyard (**Pioneer Switchard**) to the Judson 345-kV Substation (**Judson Substation**). Within the PGS property, the Project includes approximately one-half mile of 345-kV double-circuit configuration transmission line connecting to natural gas reciprocating internal combustion engines (**RICE**). In addition, two

combustion turbine generators (**CTGs**) within PGS will be connected to the Pioneer switchyard via 345-kV transmission lines. The Pioneer Switchyard, CTGs, and the RICE were previously certified by the Commission as part of Basin Electric's PGS Phase IV expansion (Case PU-22-380). No other facilities will be constructed as part of the Project and Basin Electric has no plans for further expansion of the Project.

**Q.12. Please describe the general location of the Project.**

A.12. The Project is located in Williams County, North Dakota, a primarily rural, agricultural area. The Project runs in a northwest to southeast direction from the Pioneer Generation station to the existing Judson substation approximately three miles west of the city of Williston. The Project Route, Project Corridor, and study area are entirely within Williams County, North Dakota

**Q.13. Will the Project be owned by Basin Electric?**

A.13. Yes.

**Q.14. What is the schedule for the Project?**

A.14. Basin Electric intends to commence construction in the spring of 2024 pending permit approvals. Basin Electric anticipates that construction will be complete by the end of 2024, with reclamation extending into 2025 as needed. Most activities will take place during the North Dakota construction season, generally beginning in March or April and ending in November or December. Basin Electric will utilize winter construction to the extent required.

**Q.15. What is the estimated cost of the Project?**

A.15. The total cost of the Project is estimated to be \$31 million.

### **III. Project Design**

**Q.16. Please describe the proposed transmission structure design.**

A.16. The Project will consist of a 345 kV transmission line with approximately 81 single-pole transmission line structures. The Project will use galvanized steel monopoles with three steel davit arms for the conductor phases, one steel davit arm for overhead ground wire, and one steel davit arm for optical ground wire (**OPGW**). Double-circuit poles will use six steel davit arms for the conductor phases. Detailed structure

configurations are included in Appendix B.

The OPGW will provide lightning suppression and fiber optic communications between the Pioneer Switchyard and Judson Substation for systems control. All structures, including tangent structures, angle structures (used where the transmission line changes direction), and dead-end structures (used to provide longitudinal stability along the length of the line), will be constructed on drilled concrete pier foundations. All structures will be self-supporting and permanent guy wires will not be used.

**Q.17. Please describe the Pioneer Switchyard and Judson Substation.**

A.17. The Pioneer Switchyard is located adjacent to the Pioneer Generation Station owned by Basin Electric. The new four terminal switchyard is under construction as part of the PGS Phase IV project and will provide a 345-kV connection for two combustion turbine generators (CTG), and a reciprocating engine generation facility. The Judson Substation includes an existing terminal for the new transmission line. Project activities that will be required at the Judson Substation include upgrading the existing line relays to match the new installation at the Pioneer Switchyard.

**Q.18. What factors determine the height of the structures?**

A.18. Structure height is selected to meet minimum electric clearances and optimized for the topography and road and utility crossings. For this project, the structures will range in height from approximately 105 feet to 165 feet with an average of 120 feet, depending on the required span distances between structures and area topography. The span between structures will range from 200 to 1,250 feet and average approximately 900 feet.

**Q.19. What conductor is Basin Electric proposing to use for the Project?**

A.19. The project is using an aluminum conductor with a composite carbon fiber conductor core. The conductor size is 1.72 inch diameter. The circuit configuration will be vertical for the length of the double circuit portion of the line and delta for the single circuit portion of the line.

**Q.20. What type of foundation will be used for the structures?**

A.20. All structures will require reinforced concrete drilled pier foundations. The pier diameters will range from 7 to 13 feet and extend to depths from 20 to 40 feet, depending on structure loading and soil properties. Each tangent structure will require a foundations of 7 to 8 feet in diameter. Angle structures and dead-end structures will be larger, with 10 to 13 foot diameter foundations. The transmission line will require approximately 19 angle and dead-end structures.

Q.21. **What standards did Basin Electric use to design the Project?**

A.21. Basin Electric designed and will construct the Project Project in compliance with the requirements of the National Electrical Safety Code (**NESC**) for the Heavy Loading District, U.S. Department of Agriculture (**USDA**) Rural Utilities Service (**RUS**) design criteria, other applicable local and national building codes.

Q.22. **In addition to the aforementioned standards, what other factors did you consider when designing the Project?**

A.22. Basin Electric now designs all 345kV transmission circuits to meet the minimum design standards from Southwest Power Pool (**SPP**) for current-carrying capacity, which is 3,000 amperes.

Q.23. **What are the minimum clearances over cultivated land, pasture, roads, and other utility lines?**

A.23. Basin Electric adheres to the NESC requirements plus a buffer to develop minimum design clearances. The minimum clearances for this Project are 30 feet over agricultural land, paved roads, rural roads and railroads.

#### **IV. Route Selection**

Q.24. **What was Basin Electric's philosophy when routing the Project?**

A.24. Basin Electric routed the Project to minimize impacts to the environment and to accommodate existing and planned land uses while managing construction and maintenance costs. Specifically, Basin Electric evaluated the following criteria/objectives in routing the Project:

- Compliance with the Commission's Avoidance and Exclusion criteria;
- Minimize disturbance to cultivated croplands;
- Avoid areas with identified recreational significance when possible;

- Limit interference with oil and gas development;
- Decrease construction and maintenance hazards;
- Span wetlands when possible; and
- Avoid areas less suitable for construction and operation, including river valleys, rugged terrain, steep slopes, areas requiring unusually long spans and areas lacking reasonable access.

**Q.25. How have landowner concerns influenced the structural design of the Project?**

A.25. Basin Electric has adjusted the route where possible to address landowner requests for structure locations, even where it increased project costs. Basin Electric selected structure locations to minimize impacts to cultivated areas, such as placing structures at the field edge or property divisions when possible. Landowners generally prefer transmission lines with self-supported steel structures and no guy wires. Using self-supporting single pole structures on foundations without guy wires reduces the structure footprint and minimizes the impact to their land use.

**Q.26. Has Basin Electric filed the structure locations for the Project?**

A.26. Yes. The structure locations were filed with the application on October 18, 2023.

**Q.27. Would it be reasonable or feasible to place the transmission line underground?**

A.27. Basin Electric procured a consultant report on current practices and costs for high voltage underground transmission for evaluation for this Project and other upcoming transmission projects. At the 345kV voltage class for this ampacity, estimated costs are over 20 times higher than overhead construction. Due to the significant costs and complexity of installing and maintaining underground high voltage transmission, it is generally not used in the industry unless overhead transmission is not feasible. Further, underground cable requires extensive excavation which would create significantly more ground disturbance than overhead construction.

## **V. Construction**

**Q.28. Please describe the construction sequence, work force, and equipment required to construct the Project?**

A.28. Transmission line construction will generally follow a sequential set of activities performed by crews proceeding along the length of the line.

- Structure site clearing and vegetation management is expected to require four to six personnel, equipment including pickups, all-terrain vehicles and take approximately one month to complete.
- Foundation Installation is expected to take two or three personnel and equipment will include rotary drilling rigs, backhoes, pickups, rubber-tired digging equipment, ATVs, and portable compressors over the course of about two months.
- Structure delivery and assembly will require 6–8 Pickups, cranes, material trucks, rubber-tired crane, and take approximately two months and will overlap with foundation installation.
- Structure setting will require six to eight personnel and will require equipment including rubber-tired cranes, boom trucks, 4x4 pickups and will take approximately two months to complete.
- Ground wire and conductor stringing is expected to require 16 to 20 people using pickups, manlifts and boom trucks, hydraulic tensioning machines, and reel trailers over the course of two months.
- Cleanup will likely take four people with pickups, dump trucks, flatbed trucks and will last the duration of the Project.

**Q.29. How is the clearing of trees during construction carried out?**

A.29. Basin Electric will remove trees that pose a clearance or safety problem to the operation of the transmission line. Stumps will be finished off with a level cut at an elevation not more than three inches above the ground line. If requested by the landowner, mulch will be delivered to the landowner for his or her use. Material that is not wanted by the landowner will be disposed of at an approved disposal area. During operation of the transmission line, Basin Electric maintenance crews will monitor vegetation growth to ensure there are no clearance violations or trees that can fall into the conductor zone.

**Q.30. Describe the steps Basin Electric will take when construction is complete.**

A.30. Basin Electric will complete a final inspection of the Project Corridor upon completion of construction, identifying items which may require corrective action. If required, a contractor will be released from further responsibility upon verification of satisfactory corrective action. Disturbed areas will be graded or re-sloped to their approximate

original contours to minimize erosion and visual alteration. In grassland or pasture areas, disturbed areas will be reseeded with native species unless an alternate seed mix is required by the landowner. Cultivated land will be tilled and returned to production. Rangeland from which vegetation has been damaged will be reclaimed and revegetated. Reclamation activities, weather permitting, will be ongoing throughout construction and possibly the following construction season. The area will be revegetated using a native seed mixture, as recommended by the County Agricultural Extension Service or the Natural Resources Conservation Service unless an alternate seed mix is required by the landowner. Ruts and scars from overland travel will be leveled to break up compacted soils and aid in returning areas to approximate original contours. Cultivated areas disturbed by overland travel will be leveled and tilled to break up compacted soils (if necessary) and returned to production.

**Q.31. Please describe the typical maintenance on transmission lines like those for the Project.**

A.31. The following operation and maintenance activities will be performed throughout the life of the Project.

- Basin Electric's preventive maintenance program for the transmission line includes aerial and ground inspections. Aerial inspections will be conducted at least two times each year. Ground patrols will be conducted annually for the first three or four years, and less frequently thereafter. Climbing inspections of structures will be conducted on a five-year cycle with every fifth structure inspected each year. Inspections and patrols will involve the use of vehicles in areas where there is suitable vehicle access.
- Maintenance activities may include repairing damaged conductor, inspecting and repairing structures, replacing damaged insulators, and tightening hardware.
- Basin Electric will maintain any gates installed if used for access throughout the life of the Project.
- Basin Electric will remove trees that pose a clearance or safety problem to the operation of the transmission line. Specific requirements of the National Electric Reliability Council will be followed. This activity will be completed in accordance with the landowner easement.

- Treatment of vegetation within the Project Corridor will include the selective removal of trees to prevent contact with the transmission line conductors. Disposal of cut trees and/or shrubs will be in a manner acceptable to the landowner and in accordance with applicable state waste management rules. The need for tree and/or shrub removal is expected to be minimal, as areas with trees and/or shrubs were generally avoided when possible during detailed routing.

**Q.32. When does Basin Electric plan to commence Reclamation?**

A.32. The optimal timing for revegetation success will be spring or fall. Mulching may be required to protect seeded areas from erosion. Other erosion control devices, such as water bars, terracing, or water diversion structures will be constructed where needed. Follow-up inspections will be carried out during the next growing season. If there are areas that did not become revegetated, they will be reseeded again as needed. The reclamation procedures described above will be applied to disturbed areas including temporary workspaces, access, staging areas, and other areas disturbed by Project activities. Basin Electric's Right-of-Way Division will oversee the reclamation work as needed.

**Q.33. What benefits does the Project provide to the local economy?**

A.33. The Project is a result of increased demand for electric service from Basin Electric's member owners and regional economic development. The wages and salaries paid to local contractors and workers will provide personal income for residents and workers in Williams County and the region. Basin Electric's business expenditures for equipment, energy, fuel, operating supplies and other products and services will benefit local businesses as well as amounts paid out as state and local taxes.

**Q.34. What type of labor force will Basin Electric need for the Project?**

A.34. Basin Electric will need a general and specialized labor force to complete the Project. Specialized labor will be required for certain components of the Project. It is likely that this labor will be imported from other areas of the state and other states. Basin Electric has utilized several local firms in developing the Project and compiling this application including a survey firm and geotechnical engineering firm and will continue to use local labor to the extent practicable.

Q.35. **What housing provisions are required for this type of work force?**

A.35. Basin Electric does not anticipate the Project will have any permanent effects on housing. During construction, non-resident laborers will likely use lodging facilities in and around the city of Williston or may bring travel trailers.

Q.36. **What steps has Basin Electric taken or will take to be prepared for an emergency that may arise, either during or after construction?**

A.36. The line route is submitted to local emergency agencies prior to any construction activity taking place. First responders will have the GPS coordinates to each structure location to facilitate prompt navigation to the site. Judson substation and the Pioneer site each have a 911 address and will be communicated to all contractors working on those sites.

Q.37. **What efforts has Basin Electric undertaken or will undertake to ensure the safety of the workforce constructing the Project?**

A.37. All construction and maintenance activities will be carried out in compliance with applicable federal and state worker safety regulations, as defined under the Occupation Safety and Health Administration Act of 1979 (**OSHA**). Worker safety and health is administered by Basin Electric's Transmission Systems Maintenance Division, which is a member of the National Safety Council. Basin Electric has an OSHA-based safety program supported by the Energy Coalition for Contractor Safety (**ECCS**). The program states requirements for contractors, contractor's employees, and subcontractors. All potential contractors will be evaluated against the safety program through a pre-qualification process.

## **VI. Policy Criteria**

Q.38. **What is Basin Electric's policy with respect to maximizing potential benefits through location and design of its facilities?**

A.38. The location is based on landowner participation, field surveys, known environmentally sensitive areas, and adherence to Williams County and the Commission's transmission line requirements. The Project design will meet the requirements of the National Electrical Safety Code for the Heavy Loading District, Basin Electric, USDA, RUS design criteria, and other applicable building codes. The

location and voltage of these facilities is determined by transmission planning experts to maximize the benefits of these lines.

**Q.39. What is Basin Electric's policy regarding labor relations?**

A.39. Basin Electric uses both union and non-union contractors and maintains an equitable and fair relationship with labor unions. No labor relations would be negatively affected by the Project.

**Q.40. What efforts has Basin Electric made to economize the costs of construction and operation of this Project?**

A.40. Basin Electric has an obligation to its member cooperatives to construct facilities to manage costs while maintaining reliability and safety. All materials and services are competitively bid by qualified suppliers. Basin Electric combines purchases with other projects to take advantage of volume pricing. Basin Electric maintains its own facilities, minimizing the cost of contracted services.

**Q.41. What is Basin Electric's policy and what efforts have been made to coordinate facilities?**

A.41. Basin Electric coordinates with Mountrail-Williams Electric Cooperative and other area overhead and underground utility companies along the planned route of the transmission line to meet clearance and operational requirements of existing facilities.

**Q.42. Mr. Nasset, based on your knowledge of the Project, do you believe the location, construction and operation of the proposed facilities produce minimal adverse effects on the environment and upon the welfare of the citizens of North Dakota?**

A.42. Yes.

**Q.43. Will the proposed facility locations ensure continuing system reliability and integrity and that energy needs are met and fulfilled in an orderly and timely fashion?**

A.43. Yes.

**Q.44. Does this complete your testimony?**

A.44. Yes.