

Before the Public Service Commission
of
The State of North Dakota

In the Matter of the Application of
BASIN ELECTRIC POWER COOPERATIVE
For a Consolidated Certificate of Corridor Compatibility
and Route Permit for the
Neset to Northshore 230-kV Transmission Project

Case No. PU-21-049

Pre-filed Testimony
of
Bobby Nasset

1 **I. Introduction**

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

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

5
6 Q.2. **Please state your educational and professional background.**

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

9
10 Q.3. **What is your employment history and work experience with Basin Electric?**

11 A.3. I have been employed with Basin Electric for five years and 15 years as a civil
12 engineer. My experience includes the routing, design and construction administration
13 of numerous high voltage transmission projects throughout the Midwest and design
14 support for operations and maintenance of existing transmission lines.

15
16 Q.4. **What have been your responsibilities in connection with the Neset to
17 Northshore Transmission Project ("Project")?**

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

21
22 Q.5. **Would you please describe the various people or groups of people that are
23 assisting with the Project?**

24 A.5. Basin Electric has assigned team leads in engineering, environmental/permitting,
25 surveying, right-of-way, legal, procurement, communications and construction
26 management. We have also used environmental, surveying and engineering
27 consultants for the Project.

28
29 Q.6. **Before we discuss the Project, would you please describe Basin Electric?**

30 A.6. Basin Electric is a regional wholesale electric generation and transmission
31 cooperative organized under the laws of the State of North Dakota, and
32 headquartered in Bismarck, North Dakota. Basin Electric provides power to 141
33 member cooperatives serving three million consumers.

1 Q.7. **What areas do Basin Electric members serve?**

2 A.7. Basin Electric has members in nine states; North Dakota, South Dakota, Nebraska,
3 Montana, Minnesota, Iowa, Colorado, Wyoming and New Mexico, with a service
4 territory comprising 550,000 square miles. The Project will provide a new delivery
5 point for Mountrail-Williams Electric Cooperative, the local electric cooperative.
6

7 Q.8. **Who controls Basin Electric?**

8 A.8. Basin Electric and its member systems are owned by the members at the end of the
9 line. Each of our Class A members has one seat on the 11-member Board of
10 Directors.
11

12 Q.9. **What are the business principles on which Basin Electric operates?**

13 A.9. Basin Electric follows the cooperative business model, embracing the seven
14 cooperative principles: open and voluntary membership; democratic member control;
15 members' economic participation; autonomy and independence; education, training,
16 and information; cooperation among cooperatives; and, concern for community. Basin
17 Electric pursues a smart and affordable energy strategy, and takes advantage of the
18 benefits of renewables while maintaining baseload that ensures the reliability our
19 members expect. Basin Electric's margins must be used to improve or maintain
20 operations, set aside in reserves, or distributed to the membership.
21

22 Q.10. **What will you discuss in your testimony today?**

23 A.10. In my testimony I will describe the Project design and construction as well as the
24 policy criteria Basin Electric used in designing the Project and will use during
25 construction.

26 **II. Project Description**

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

28 A.11. The Project consists of approximately 27 miles of 230 kV electric transmission line
29 from the existing Neset substation to the proposed Northshore substation, entirely
30 within Mountrail County, North Dakota. Northshore is a new substation that will be
31 constructed as part of this Project. The Project includes adding a new terminal at the
32 Neset substation.
33

1 Q.12. **Can you please describe the general location of the Project?**

2 A.12. The Neset substation is four miles east of Tioga. The Northshore substation will be
3 eight miles south of Ross, ND. The transmission line generally runs east and south
4 from Neset to Northshore.

5

6 Q.13. **Please describe the two substations that are a part of the Project.**

7 A.13. The existing Neset Substation is approximately 11 acres and the Northshore
8 Substation will be approximately 10 acres. The Northshore substation will contain a
9 230kV to 115kV transformer, circuit breakers, disconnect switches, grounding
10 switches and protection and control equipment.

11

12 Q.14. **Will the Project be owned by Basin Electric?**

13 A.14. Yes.

14

15 Q.15. **Can you describe the schedule for the Project?**

16 A.15. Basin Electric is planning to start construction on the Neset to Northshore
17 Transmission Line in August of 2021 and complete the work by October 31, 2022,
18 with energization by the end of 2022.

19

20 Q.16. **What is the estimated cost of the Project?**

21 A.16. The total cost of the Project is estimated to be \$57.4 million.

22 **III. Project Design**

23 Q.17. **Please describe the proposed transmission structure design.**

24 A.17. Structures for the 230kV transmission line will be constructed using galvanized steel
25 poles. Segments of the line will utilize both h-frame and monopole structures. The
26 angle structures will be self-supporting and installed on drilled pier concrete
27 foundations. The in-line tangent and small angle structures will be direct-buried. Guy
28 wires will not be used for any angle structures. Approximately 155 structures will be
29 needed for the Project, ranging from 55 to 120 feet above ground, depending on the
30 required span distances due to the topography. Special structure spotting
31 considerations are necessary when crossing roads, other transmission lines, bodies
32 of water, or other challenging terrain.

33

- 1 Q.18. **What factors determine the height of the structures?**
- 2 A.18. The span lengths are optimized for the topography and clearance requirements for
3 the 230kV voltage to ground, roadways, railroad or other utilities. The spans for this
4 project range from 600 to 1200 feet. Topography, conductor sag and required ground
5 clearance are used to determine the required structure height.
6
- 7 Q.19. **On average, how many structures are needed for every one mile of**
8 **transmission line?**
- 9 A.19. This varies throughout the Project, but on average there are approximately six
10 structures per mile.
11
- 12 Q.20. **What conductors is Basin Electric proposing to use for the Project?**
- 13 A.20. The transmission line will have three current carrying conductors with aluminum
14 stranding around a reinforced steel or composite core. The conductors will be 1.345
15 inches in diameter. Above the conductors will be one optical ground wire and one
16 7/16-inch diameter steel wire. These wires provide lightning protection and optical
17 fibers for communications. The minimum conductor clearance to ground will be 26
18 feet at 212° F conductor temperature.
19
- 20 Q.21. **What type of foundation will be used for the structures?**
- 21 A.21. The Project will use direct embedded and backfilled with crushed rock aggregate for
22 tangent (in-line) and small-angle (less than 3 degrees) structures. The embedment
23 depths vary with structure height. Angle and dead-end type structures will be placed
24 on concrete piers. The dead-end structures are capable of having full longitudinal
25 tension. The pier depth and diameter will be based on soil borings. The diameters of
26 a pier can range from six to ten feet and depths can range from 20 feet to 30 feet
27 deep. Piers outside of this size range may be required depending on site conditions.
28
- 29 Q.22. **What standards did Basin Electric use to design the Project?**
- 30 A.22. The Project will be constructed according to standards of the Rural Utilities Service,
31 the National Electric Safety Code, the Institute of Electrical and Electronics
32 Engineers, the American Society of Civil Engineers, the American Institute of Steel
33 Construction and the American Concrete Institute. In addition, Basin Electric has its
34 own standards and design criteria for operational and maintenance consistency.

1 Q.23. **In addition to the aforementioned standards, what other factors did you**
2 **consider when designing the Project?**

3 A.23. The goal of the design is to meet the ampacity requirements in the formal Notice to
4 Construct document from the Southwest Power Pool (**SPP**). After meeting those
5 requirements and the national standards listed above, Basin Electric staff tries to
6 optimize the design in a way that best benefits Basin Electric’s members while
7 ensuring reliability and requirements for long-term operation and maintenance of the
8 transmission line.

9

10 Q.24. **What are the minimum clearances over cultivated land, pasture, roads, and**
11 **other utility lines?**

12 A.24. Basin Electric adheres to National Electric Safety Code (**NESC**) requirements plus a
13 buffer to develop minimum design clearances. The minimum clearances for this
14 project are:

- 15 • Cultivated or Pasture Land: 26’
- 16 • Roads & Highways: 31’
- 17 • Railroad: 38’
- 18 • Transmission Line Crossings: 12’ – 16’ depending on the voltage of the
19 line being crossed.

20 These are the minimum design clearances at the conductor’s maximum operating
21 temperature. During normal operating conditions, the conductor will have less sag
22 and will exceed the minimum clearance values.

23 **IV. Route Selection**

24 Q.25. **Why is Basin Electric using a 150-foot and 125-foot corridor?**

25 A.25. The Project corridor is 150-feet-wide and 125-feet-wide, depending on structure
26 configuration and span lengths. Basin Electric selected this width based on how the
27 suspended conductor may be expected to blow out during high wind conditions plus
28 the distance needed to maintain safe electrical clearances. Further, space is also
29 needed for construction and maintenance activities.

30

31 Q.26. **What was Basin Electric’s philosophy when routing the Project?**

32 A.26. Basin Electric routed the Project to minimize impacts to the environment and to
33 accommodate existing and planned land uses while managing construction and

1 maintenance costs. Specifically, Basin Electric evaluated the following
2 criteria/objectives in routing the Project:

- 3 • Comply with the Commission's Avoidance and Exclusion criteria;
- 4 • Minimize disturbance to cultivated croplands;
- 5 • Avoid areas with identified recreational significance when possible;
- 6 • Limit interference with oil and gas development;
- 7 • Decrease construction and maintenance hazards;
- 8 • Span wetlands when possible; and
- 9 • Avoid areas less suitable for construction and operation, including river
10 valleys, rugged terrain, steep slopes, areas requiring unusually long spans
11 and areas lacking reasonable access.

12
13 **Q.27. How have landowner concerns influenced the structural design of the Project?**

14 A.27. Landowners generally prefer transmission lines with self-supported steel structures
15 and no guy wires. The use of single pole structures minimizes the impact to their land
16 use. H-frames allow for longer spans in areas with challenging topography.

17
18 **Q.28. Has Basin Electric filed the structure locations for the Project?**

19 A.28. Yes. Those were filed with the Commission on April 27, 2021.

20
21 **Q.29. Would it be reasonable or feasible to place the transmission line underground?**

22 A.29. No. Placing the transmission line underground is neither feasible nor reasonable for
23 this Project. The cost would be near ten times greater than overhead construction.
24 Further, underground cable requires extensive excavation which would create
25 significantly more environmental disturbance than overhead construction.
26 Maintenance of underground lines causes a considerable amount of disturbance,
27 which landowners dislike.

28
29 **Q.30. Please describe the typical maintenance on transmission lines like those for
30 the Project.**

31 A.30. The normal maintenance on transmission lines revolves around inspection. Every six
32 months, Basin Electric transmission system maintenance (**TSM**) staff inspect the
33 transmission lines in an airplane. TSM staff also perform detailed inspections of
34 individual structures every three years, unless conditions require more frequent

1 inspections.

2 **V. Construction**

3 Q.31. **Would you describe the construction procedures and work force required to**
4 **construct the Project?**

5 A.31. The construction will be done in a sequential manner, consisting of a series of small
6 crews spread out over the length of the line. As one crew completes work in an area,
7 the next crew enters, and proceeds with the next construction activity. Crew size
8 depends on the contractor's means and methods for construction. The actual
9 manpower needs will vary, depending on time constraints, contractor procedures,
10 terrain, seasonal conditions, and other factors.

11

12 Q.32. **Please describe the construction activities for installation of the transmission**
13 **line.**

14 A.32. The construction activities for installation of the transmission line include:

- 15 • Structure Staking
- 16 • Gate installation
- 17 • Tree clearing (if necessary)
- 18 • Foundation installation
- 19 • Structure hauling
- 20 • Structure framing
- 21 • Structure erection
- 22 • Conductor installation
- 23 • Conductor clipping
- 24 • Reclamation

25

26 Q.33. **Please describe the construction activities for the Northshore substation.**

27 A.33. The construction activities for the Northshore substation include:

- 28 • Access approach and driveway installation
- 29 • Installation of erosion and sediment controls
- 30 • Site grading and aggregate surfacing
- 31 • Foundation installation
- 32 • Structure and electrical bus installation
- 33 • Installation of transformer, circuit breakers, control building and electrical

- 1 equipment
- 2 • Testing and commissioning

3

4 **Q.34. Where will gates be installed?**

5 A.34. When crossing existing fence lines, Basin Electric will install barb wire gap gates. If
6 required by property owner or tenants, gates will be locked. Basin Electric consults
7 landowners to determine the most appropriate placement for the gates.

8

9 **Q.35. How is the clearing of trees during construction carried out?**

10 A.35. Basin Electric will remove trees that pose a clearance or safety problem to the
11 operation of the transmission line. Stumps will be finished off with a level cut at an
12 elevation not more than three inches above the ground line. If requested by the
13 landowner, trees will be cut to lengths and delivered to the landowner for his or her
14 use. Material that is not wanted by the landowner will be disposed of at an approved
15 disposal area. During operation of the transmission line, Basin Electric maintenance
16 crews will monitor vegetation growth to ensure there are no clearance violations or
17 trees that can fall into the conductor zone.

18

19 **Q.36. Describe the steps Basin Electric will take when construction is complete.**

20 A.36. After construction is complete Basin Electric will complete a final inspection of the
21 corridor, identifying items which require corrective action. When corrections have
22 been verified, the contractor will be released from further responsibility. Basin
23 Electric's Right-of-Way Division will oversee the reclamation work as needed.

24

25 **Q.37. What is done with the spoil from any excavation which is required during
26 construction?**

27 A.37. Basin Electric will employ best management practices during construction to monitor
28 soil impacts and segregate top soil. Unused spoils from all excavations will be
29 removed from the corridor unless the landowner requests them to be placed in a
30 specific location off of the corridor on their property for other uses.

31

32 **Q.38. What benefits does the Project provide to the local economy?**

33 A.38 The wages and salaries paid to local contractors and workers will provide personal
34 income for residents and workers in Mountrail County and the region. Basin Electric's

1 business expenditures for equipment, energy, fuel, operating supplies and other
2 products and services will benefit local businesses as well as amounts paid out as
3 state and local taxes.

4
5 **Q.39. What type of labor force will Basin Electric need for the Project?**

6 A.39. Basin Electric will need a general and specialized labor force to complete the Project.
7 We expect that a generally skilled labor force is available in the county or the western
8 area of the state to serve the basic needs of the Project. A specialized labor force will
9 be required for certain components of the Project. It is likely that this labor force will
10 be imported from other areas of the state or from other states, as the relatively short
11 duration of construction does not allow for special training of laborers.

12
13 **Q.40. What housing provisions are required for this type of work force?**

14 A.40. Most workers usually stay in commercial accommodations near their work location in
15 and around the cities of Tioga, Stanley, and New Town. A few workers may bring
16 travel trailers and place them in trailer parks in towns along the route, where these
17 facilities are available.

18
19 **Q.41. What steps has Basin Electric taken or will take in order to be prepared for an
20 emergency situation that may arise, either during or after construction?**

21 A.41. The line route is submitted to local emergency agencies prior to any construction
22 activity taking place. Thus, first responders will have GPS coordinates to facilitate
23 prompt navigation to the site. The Neset and Northshore substations both have a
24 911 address and this will be communicated to all contractors working on those sites.

25
26 Material staging areas and vehicle maintenance and refueling areas will not be
27 located near waterways. If any of the material staging areas include vehicle and
28 equipment refueling or storage of petroleum product in excess of 1,320 gallons, a
29 Spill Prevention, Control, and Countermeasure (SPCC) plan will be developed.

30
31 **Q.42. What efforts has Basin Electric undertaken or will undertake to ensure the
32 safety of the workforce constructing the Project?**

33 A.42. Basin Electric has an OSHA-based safety program supported by the Energy Coalition
34 for Contractor Safety (ECCS) for all contractors that work for the Cooperative. The

1 program states requirements for contractors, contractor's employees, and
2 subcontractors. All potential contractors will be evaluated against the safety program
3 through a pre-qualification process and only contractors that meet the requirements
4 will be allowed to bid on and work on the Project.

5 **VI. Policy Criteria**

6 **Q.43. What is Basin Electric's policy with respect to maximizing potential benefits**
7 **through location and design of its facilities?**

8 A.43. The location is based on landowner participation, field surveys, known
9 environmentally sensitive areas, and review of Mountrail County and state
10 transmission line requirements. The Project design will meet the requirements of the
11 National Electrical Safety Code for the Heavy Loading District, Basin Electric, U.S.
12 Department of Agriculture (USDA) Rural Utilities Service (RUS) design criteria, and
13 other applicable local or national building codes. The location and voltage of these
14 facilities is determined by transmission planning experts to maximize the benefits of
15 these lines.

16
17 **Q.44. What is Basin Electric's policy concerning the training and use of available**
18 **labor in North Dakota for the general and specialized skills required?**

19 A.44. Basin Electric has utilized several local firms in developing the Project and compiling
20 this application including a survey firm and geotechnical engineering firm and will
21 continue to use local labor to the extent practicable.

22
23 **Q.45. What is Basin Electric's policy regarding labor relations?**

24 A.45. Basin Electric uses both union and non-union contractors and maintains an equitable
25 and fair relationship with labor unions.

26
27 **Q.46. What efforts has Basin Electric made to economize the costs of construction**
28 **and operation of this Project?**

29 A.46. Basin Electric has an obligation to its member cooperatives to construct facilities to
30 manage costs while maintaining reliability and safety. All materials and services are
31 competitively bid by qualified suppliers. Basin Electric will combine purchases with
32 other projects to take advantage of volume pricing. Basin Electric maintains its own
33 facilities, minimizing the cost of contracted services.

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Q.47. **What is Basin Electric’s policy and what efforts have been made to coordinate facilities?**

A.47. 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.48. **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.48. Yes.

Q.49. **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.49. Yes.

Q.50. **Does this complete your testimony?**

A.50. Yes.