

Before the Public Service Commission
of
The State of North Dakota

In the Matter of the Application of
BASIN ELECTRIC POWER COOPERATIVE

for a

Certificate of Site Compatibility
for the
Pioneer Generation Station Phase IV Project

Case No. PU-22-380

Pre-filed Testimony
of
James Lund

1 I. **Introduction**

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

3 A. My name is James Lund. I am employed as a Senior Mechanical Engineer for Basin
4 Electric Power Cooperative (**Basin Electric**), located at 1717 East Interstate Avenue,
5 Bismarck, North Dakota.

6

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

8 A. I received Bachelor's and Master's Degrees in Mechanical Engineering from South
9 Dakota State University in Brookings. I am a registered professional engineer in North
10 Dakota and Wyoming.

11

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

13 A. I have been employed with Basin Electric for twenty-eight years as a mechanical
14 engineer and project manager. My experience includes seven years as field engineer
15 at Laramie River Station near Wheatland, Wyoming; eight years as a lead mechanical
16 engineer for the Dry Fork Station construction project near Gillette, Wyoming; and,
17 four years as a project manager for multiple major air emission control projects at
18 Laramie River Station and Leland Olds Station.

19

20 Q. **Would you please describe Basin Electric?**

21 A. Basin Electric is a regional wholesale electric generation and transmission
22 cooperative corporation organized under the laws of the State of North Dakota and
23 headquartered in Bismarck, North Dakota. Basin Electric provides power to 131
24 member cooperatives serving three million consumers in nine states; North Dakota,
25 South Dakota, Nebraska, Montana, Minnesota, Iowa, Colorado, Wyoming, and New
26 Mexico, with a service territory comprising 550,000 square miles.

27

28 Q. **Please describe Basin Electric's business model.**

29 A. Basin Electric and its member systems are owned by the member cooperatives at the
30 end of the line. Each of Basin Electric's 11 Class A members has one seat on the
31 Board of Directors. Basin Electric follows the cooperative business model, embracing
32 the seven cooperative principles: open and voluntary membership; democratic
33 member control; members' economic participation; autonomy and independence;

1 education, training, and information; cooperation among cooperatives; and, concern
2 for community. Basin Electric pursues a smart and affordable “all of the above”
3 strategy to take advantage of the benefits of renewable energy while maintaining
4 baseload generation to ensure the reliability that our members require. Basin
5 Electric's business model requires that margins must be used to improve or maintain
6 operations, set aside in reserves, or distributed to the membership.

7
8 Q. **Would you please describe the groups of people that are assisting with the
9 Pioneer Generation Station Phase IV Project (Project)?**

10 A. Basin Electric has assigned team leads in engineering, environmental services and
11 permitting, surveying, right-of-way, legal, procurement, communications, and
12 construction management. Basin Electric has utilized environmental, surveying, and
13 engineering consultants for the Project development, and has contracted with a firm
14 to perform the Project design, procurement, and construction.

15
16 Q. **What have been your responsibilities in connection with the Project?**

17 A. I am the Project Coordinator. I am responsible for activities associated with the
18 development and execution of the Project.

19
20 Q. **What will you discuss in your testimony today?**

21 A. In my testimony I will describe the Project design and construction, and address the
22 Commission's policy criteria.

23 **II. Project Description**

24 Q. **Please describe the existing Pioneer Generating Station.**

25 A. The existing Pioneer Generating Station (**PGS**) is located on a 120-acre parcel, 15
26 miles northwest of Williston in Williams County, North Dakota at Section 20, Township
27 155 North, Range 103 West. The site is adjacent to ONEOK's Stateline Gas Plant
28 and Mountrail-Williams Electric Cooperative Stateline Substation. The existing PGS
29 was constructed in three phases. Phase I included: one 45 megawatt simple cycle
30 combustion turbine and associated balance of plant equipment; an operations &
31 maintenance building; natural gas and water interconnects; and, a 115 kilovolt
32 transmission line. This combustion turbine was designated Unit 1 and began
33 commercial operation in September of 2013. Phase II consisted of two additional 45

1 megawatt simple cycle combustion turbines and the associated balance of plant
2 equipment. These combustion turbines were designated Unit 2 and Unit 3. PGS Unit
3 2 began commercial operation in February 2014, and Unit 3 in March 2014. In 2017,
4 twelve gas reciprocating engines and auxiliary equipment with a total nominal
5 electrical output of 111 megawatts were put in to commercial operation in PGS Phase
6 III.

7
8 Q. **Please generally describe the Project.**

9 A. The Project consists of six nominal 18.8-megawatt (**MW**) natural gas reciprocating
10 internal combustion engines (**RICE**) and two F-Class natural gas-fired simple-cycle
11 combustion turbines (**F-Class Combustion Turbines**) with the capacity to produce
12 up to 250 MW each. The RICE would be located south of PGS on the existing 120-
13 acre parcel. The F-Class Combustion Turbines would be constructed to the north in a
14 160-acre parcel adjacent to PGS that was purchased by Basin Electric on September
15 29, 2022.

16
17 Q. **Who will the Project serve?**

18 A. The Project will serve members in Basin Electric's service territory, including Class A
19 member Upper Missouri Electric Cooperative and Class C Member, Mountrail
20 Williams Electric Cooperative, which serve members in northwestern North Dakota
21 within the Williston Basin.

22
23 Q. **Please describe the schedule for the Project.**

24 A. Should the Commission decide to grant Basin Electric a Certificate of Site
25 Compatibility, construction is expected to begin in April of 2023 or as soon as the
26 requisite permits are received. The RICE units are planned to be constructed by
27 November of 2024, tested and commissioned in the winter of 2024 to 2025, and
28 commence commercial operation by May of 2025. The first F-Class Combustion
29 Turbine is planned to be constructed by February of 2025, testing and commissioning
30 in the Spring of 2025, and a commercial operation date (**COD**) in June of 2025.
31 Construction of the second F-Class Combustion Turbine is expected to begin in
32 August of 2025, testing and commissioning in the fall of 2025 and COD in May of
33 2026.

34

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

2 A. The cost of the work scope for this Project is approximately \$670 million, which does
3 not include Basin Electric's internal costs such as labor costs and financing fees. The
4 total Project cost is estimated to be \$788 million, including additional transmission
5 which will be permitted separately.

6 **III. Project Design**

7 Q. **Please describe the scope of the Project.**

8 A. The facilities to be constructed on the existing PGS site include:

- 9 • Six RICE units and auxiliary equipment
- 10 • A building to house the RICE units and associated equipment and
11 maintenance areas
- 12 • A stormwater pond for the RICE units
- 13 • A warehouse
- 14 • Temporary construction parking and construction trailers
- 15 • Temporary material lay down and assembly yard

16
17 The Project facilities to be constructed on newly acquired property adjacent to the
18 existing PGS include:

- 19 • Two F-Class Combustion Turbines
- 20 • A building to house the F-Class Combustion Turbines along with including
21 space for a control room and areas for administration and maintenance
- 22 • A 345-kV substation
- 23 • An evaporative Cooler Blowdown Pond
- 24 • A stormwater pond
- 25 • Temporary construction laydown, parking, and trailers

26 The Project is designed to meet variable electrical demands from as low as three MW
27 to as high as 108 MW for the six RICE engines, and from 111 MW up to 250 MW for
28 each of the F-Class Combustion Turbines.

29
30 The six RICE engines would be vented to one stack. Each engine would be equipped
31 with selective catalytic reduction systems (**SCR**) and lean-burn combustion systems
32 to control nitrogen oxides and use low sulfur/low ash fuels and good combustion
33 practices to minimize the emissions of sulfur dioxide, sulfuric acid mist, and

1 particulate matter.
2 The two F-Class Combustion Turbines would each vent to a separate stack, and
3 utilize an oxidation catalyst system upstream of the stack along with lean-burn
4 combustion practices and low sulfur/low ash fuels to minimize emissions of carbon
5 monoxide, nitrogen oxides, sulfur dioxide, sulfuric acid mist, and particulate matter.
6

7 **Q. Why were F-Class Combustion Turbines chosen for the Project instead of the**
8 **simple cycle combustion turbines used for Phase I & II or the reciprocating**
9 **engines chosen for Phase III?**

10 A. The F-Class Combustion Turbines provide the best operational flexibility and
11 economies of scale to meet the projected load growth and daily operating profile
12 compared to smaller simple cycle combustion turbines or a larger combined cycle
13 facility.
14

15 **Q. Is there associated auxiliary equipment included with the Project?**

16 A. Yes. The auxiliary equipment for the Project includes three natural-gas fired dew
17 point heaters, an evaporative cooler and associated process water holding pond, and
18 two small diesel tanks. An electrical switchyard, stormwater retention ponds,
19 temporary laydown areas, and temporary construction parking are also included as
20 part of the Project.
21

22 **Q. Have there been any changes to the Project since the application was**
23 **submitted?**

24 A. Yes. Both stormwater ponds were relocated as a result of the stormwater
25 management review process. Basin Electric is awaiting final design from Burns and
26 McDonnell to determine the final size of the process water pond.
27

28 **Q. What is the gas supply for the Project?**

29 A. Natural gas for the Project will be sourced from either the ONEOK Stateline I Gas
30 Processing Plant or the Northern Border Pipeline through a new one-half mile
31 pipeline that will connect to the existing WBI Energy Transmission system. This line
32 would follow the same route as the pipeline that currently serves PGS.
33

34 **Q. How much water will the Project consume and where does the water supply**

1 **come from?**

2 A. Water is supplied to PGS by the Northwest Rural Water District that has a dedicated
3 10 inch supply pipeline to the facility. During construction, water use would be limited
4 to water used for dust control. Water use during facility operation would include
5 potable water for the 15 additional employees, evaporative cooling water makeup for
6 the F-Class Combustion Turbine system, and facility fire protection water. Basin
7 Electric expects that the current water supply will meet the needs of the Project.

8
9 Q. **Is any new electrical transmission needed for the Project?**

10 A. No additional transmission is required to support construction of the Project. New
11 high voltage electrical transmission facilities are still in the planning phases and would
12 be sited under separate permitting authorizations.

13 **IV. Construction**

14 Q. **How will Basin Electric maintain the site during and after construction?**

15 A. Basin Electric hired Burns & McDonnell to perform the engineering, most of the
16 procurement, and the construction of the Project. Burns & McDonnell will hire their
17 own subcontractors which are required to meet Basin Electric's corporate standards.
18 Basin Electric will maintain a presence at the Project site during and after
19 construction.

20
21 During construction, crews would limit ground disturbance to the extent feasible.
22 Erosion control measures such as silt fence, rock checks, flow diverters, mulching,
23 seeding, or mesh fabric overlay will be installed during construction as needed to
24 minimize runoff into the stormwater pond.

25
26 After construction, temporary disturbance areas including laydown areas,
27 construction parking, and administration trailers will have gravel removed. For areas
28 outside the permanent footprint of the Project, any removed and stockpiled topsoil will
29 be replaced or re-spread, and reseeded to native grass. Other reclamation activities
30 include removing and disposing of debris, dismantling all temporary facilities including
31 staging, administration and construction management, and temporary material
32 storage areas, as well as leveling or filling of tire ruts.

33

- 1 Q. **Please describe the work force required to construct the Project.**
- 2 A. The workforce would be made up of different skilled trades such as electricians,
3 pipefitters and iron workers. Local labor would be used to the extent practicable.
4 Because of the tight labor market in the region and low unemployment rates, it is
5 anticipated that the majority of the construction workforce would come from outside
6 the region. Basin Electric is working with project contractors on a labor force plan and
7 will have a daily presence onsite during construction to monitor contractor
8 performance.
- 9
- 10 Q. **Please describe how Basin Electric ensures contractors are committed to**
11 **safety.**
- 12 A. Basin Electric ensures that all prospective contractors meet the corporate safety
13 standards prior to being hired by examining a contractor's work history on similar
14 projects and their recent safety statistics. Only contractors that meet Basin Electric's
15 safety standards are allowed to bid on the work. A selected contractor is required to
16 become a member of the Energy Coalition for Contractor Safety which is
17 administered by the North Dakota Safety Council. The North Dakota Safety Council
18 reviews the contractor's safety programs for compliance with Federal Occupational
19 Safety and Health Administration (**OSHA**) regulations. Prior to arrival on-site,
20 contractors are required to submit a safety and health plan for Basin Electric
21 approval. Once on site, regular safety inspections by Basin Electric ensure that each
22 contractor is using safe work practices and complying with the approved safety and
23 health plan.
- 24
- 25 Q. **What steps will Basin Electric take in order to be prepared for an emergency**
26 **situation that may arise during or after construction?**
- 27 A. On-site contractors are required to develop and submit an Emergency Response
28 Plan for Basin Electric's review to ensure that it aligns with the existing Emergency
29 Response Plan at PGS.
- 30
- 31 Q. **Does Basin Electric have an Emergency Response Plan in place for the existing**
32 **Pioneer Generation Station?**
- 33 A. Yes, Basin Electric has an Emergency Response Plan and collaborates with the local
34 emergency planning committee due to the fact the existing simple cycle combustion

1 turbine units require storage of anhydrous ammonia in excess of 10,000 pounds.

2
3 Q. **Please describe the Emergency Response Plan.**

4 A. The Emergency Response Plan addresses the protection of life, health, safety,
5 environment, and property in the event of an emergency. The plan includes
6 information about each emergency responder group with contact information and
7 identifies the response procedure based on the emergent event.

8
9 Q. **How will Basin Electric make emergency responders aware of the Project?**

10 A. During construction, the Project contractors are responsible for coordinating with local
11 emergency response agencies. After construction is complete and annually
12 thereafter, Basin Electric invites first responders and local fire departments to PGS for
13 a tour and meeting to discuss how the facility operates and the applicable procedures
14 should they be called to respond to an emergency.

15
16 Q. **How will Basin Electric ensure underground public utilities are not damaged
17 during construction of the Project?**

18 Basin Electric requires that its contractors and their sub-contractors use the North
19 Dakota One Call system to locate underground utilities at least 48 hours in advance
20 of an excavation. The contractors and sub-contractors are also required to hand dig
21 or use vacuum excavation when excavating near underground utilities.

22
23 Q. **What benefits does the Project provide to the local economy?**

24 A. The wages and salaries paid to construction contractors and workers as well as the
25 permanent employees are expected to contribute to the local economy in Williams
26 County and the region. Basin Electric's business expenditures for equipment, energy,
27 fuel, operating supplies, and other goods and services would benefit local businesses
28 in addition to amounts paid out as state and local taxes.

29
30 Q. **Will there be additional workers required for PGS to operate after the Project is
31 complete?**

32 A. Yes, the Project will require the addition of 15 additional permanent employees.

- 1 **V. Policy Criteria**
- 2 **Q. How has Basin Electric maximized potential benefits through location, process**
- 3 **and design of the Project?**
- 4 A. Basin Electric performs studies to identify facilities that are needed to ensure a
- 5 reliable generation and transmission system. Basin Electric determines the location of
- 6 facilities by evaluating viable options for fuel supply, transmission interconnection,
- 7 and available sites for generation to support a project's scope and schedule while
- 8 meeting local, state, and federal environmental requirements and minimizing impact
- 9 to the local population.
- 10 **Q. How has Basin Electric trained or utilized labor available in North Dakota for the**
- 11 **general and specialized skills required?**
- 12 A. Basin Electric has utilized local firms in developing the Project and compiling the
- 13 Project application including biological and archeological survey firms and a
- 14 geotechnical engineering firm, and will continue to use local labor to the extent
- 15 practicable.
- 16
- 17 **Q. Will the Project make use of a primary energy source or raw material located**
- 18 **within the State of North Dakota?**
- 19 A. Yes, the natural gas utilized by this Project will come from WBI Energy Transmission
- 20 Stateline Pipeline. This pipeline transports natural gas from ONEOK's Stateline
- 21 Natural Gas Processing Facility to the Northern Border Interstate Pipeline. While we
- 22 are not certain where the natural gas comes from once in the pipeline, it is likely that
- 23 some of the gas will come from North Dakota sources.
- 24
- 25 **Q. Will the Project require any relocation of residents?**
- 26 A. No.
- 27
- 28 **Q. What efforts has Basin Electric made to economize the costs of construction**
- 29 **and operation of this Project?**
- 30 A. Basin Electric has an obligation to its member cooperatives to construct facilities in a
- 31 way that manages costs while maintaining reliability and safety. By selecting the
- 32 existing PGS site for this Project, the cost of the infrastructure and transmission
- 33 interconnections was reduced, thereby minimizing the Project cost. All materials and
- 34 services are competitively bid by qualified suppliers. Basin Electric will combine

1 purchases with other projects to take advantage of volume pricing. Basin Electric
2 maintains its own facilities, minimizing the cost of contracted services.

3
4 Q. **Will a portion of the energy produced by the Project be used in this state?**

5 A. Yes.

6
7 Q. **What is Basin Electric's approach to labor relations?**

8 A. Basin Electric uses both union and non-union contractors and maintains an equitable
9 and fair relationship with labor unions.

10
11 Q. **What efforts has Basin Electric made to coordinate facilities?**

12 A. Basin Electric works closely with Western Area Power Administration (**WAPA**),
13 Montana Dakota Utilities (**MDU**), and our member systems to share facilities and
14 avoid duplication. For the past five years, Basin Electric has met with WAPA, MDU,
15 and our members on a monthly basis to discuss western North Dakota transmission
16 and generation issues.

17
18 Basin Electric selected the site for the Project to use available space on the pre-
19 owned PGS site and the adjacent land purchased for the Project. This site has
20 existing gas infrastructure and is in close proximity to high voltage transmission lines
21 as well as the Bakken area gas supply.

22
23 Q. **How does Basin Electric plan to monitor the impacts of the Project?**

24 A. Basin Electric will comply with all local, state, and federal environmental monitoring
25 and reporting regulations.

26
27 Q. **Mr. Lund, based on your knowledge of the Project, do you believe the location,
28 construction, and operation of the proposed Project produce minimal adverse
29 effects on the environment and upon the welfare of the citizens of North
30 Dakota?**

31 A. Yes.

32
33 Q. **Is the proposed Project compatible with environmental preservation and the
34 efficient use of resources?**

1 A. Yes.

2

3 Q. **Will the proposed Project minimize adverse human and environmental impacts**
4 **while ensuring continuing system reliability and integrity and ensuring that**
5 **energy needs are met and fulfilled in an orderly and timely fashion?**

6 A. Yes.

7

8 Q. **Does this complete your direct testimony?**

9 A. Yes.