

Before the Public Service Commission
of the State of Wyoming

In the Matter of the Application of
Black Hills Power Inc. d/b/a Black Hills Energy and Cheyenne Light, Fuel and Power Company
d/b/a Black Hills Energy for a Certificate of Public Convenience and Necessity to Construct and
Operate a Wind Generating Facility and Related Facilities in Laramie County, Wyoming

Docket No. 20003-__-EA-18

Docket No. 20002-__EA-18

(Record No. _____)

December 17, 2018

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ATTACHMENTS

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|--------------------------------|--|
| Confidential Attachment JH - 1 | Detailed Cost Estimate |
| Attachment JH - 2 | Detailed Construction Timeline |
| Attachment JH - 3 | Legal Description and Boundary Drawing |

1 **I. INTRODUCTION AND QUALIFICATIONS**

2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Jason Hartman. My business address is 6711 HR Ranch Rd, Cheyenne,
4 Wyoming 82007.

5 **Q. PLEASE DESCRIBE YOUR EMPLOYMENT.**

6 A. I am currently employed by Black Hills Service Company, LLC (“Black Hills Service
7 Company”), a wholly-owned subsidiary of Black Hills Corporation (“Black Hills
8 Corporation”), as Director, Generation Project Engineering. I am responsible for the
9 design, construction, and operation of electrical power generation assets owned by Black
10 Hills Corporation subsidiaries, including Cheyenne Light, Fuel and Power Company
11 (“Cheyenne Light”) and Black Hills Power, Inc. ("Black Hills Power").

12 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.**

13 A. I am a licensed professional engineer in Wyoming and earned a Bachelor of Science
14 degree with distinction in Mechanical Engineering from the University of Nebraska in
15 1993. I have more than 25 years of experience working in the electrical power industry,
16 in coal, natural gas, and renewable power generation, including power plant design,
17 construction, operations and maintenance. I was involved in the development,
18 engineering, construction and commissioning of the Cheyenne Prairie Generating Station
19 (“CPGS”) in Cheyenne, Wyoming, jointly owned by Cheyenne Light and Black Hills
20 Power. I am also currently the Plant Manager of CPGS.

21 I was also involved in the development, engineering, construction and
22 commissioning of the Pueblo Airport Generation Station ("PAGS") and the Busch Ranch

1 Wind Energy Projects, in which Black Hills Corporation subsidiaries are majority
2 owners.

3 **II. PURPOSE OF TESTIMONY**

4 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**

5 A. The purpose of my testimony is to describe the proposed project, referred to as
6 "Corriedale" or the "Corriedale Project." The Corriedale Project consists of the
7 construction of a 40 MW wind turbine generating facility in Laramie County, Wyoming
8 that will connect to the Cheyenne Light transmission system. The Corriedale Project will
9 serve customers of Black Hills Power and Cheyenne Light under the proposed
10 Renewable Ready Service Tariffs as described in the testimony of Kyle White (Exhibit
11 12). My testimony will focus on the following regarding the Corriedale Project:

- 12 • Engineering design, project cost estimate and project timeline
- 13 • Location of the project, land rights associated and environmental and
14 construction permitting.

15 **III. ATTACHMENTS**

16 **Q. ARE YOU SPONSORING ANY ATTACHMENTS TO YOUR TESTIMONY?**

17 A. Yes. I am sponsoring the following attachments:

18 Confidential Attachment JH-1 - Detailed Cost Estimate

19 Attachment JH-2 - Detailed Construction Timeline

20 Attachment JH-3 - Metes and Bounds Description of Site

21

22

23

1 **IV. ENGINEERING DESIGN**

2 **Q. PLEASE DESCRIBE HOW BLACK HILLS POWER AND CHEYENNE LIGHT**
3 **DETERMINED THE NEED FOR THE CORRIEDALE PROJECT.**

4 A. Black Hills Power and Cheyenne Light have been approached by customers seeking
5 renewable energy in order to meet desired sustainability goals. Additionally, customers
6 have indicated consideration of behind-the-meter renewable generation. Customers
7 reducing loads served by Black Hills Power and Cheyenne Light through behind-the-
8 meter renewable generation has a negative impact on other customers served by the
9 utilities, due to the decrease in fixed cost recovery from customers choosing to install
10 behind-the-meter generation. Black Hills Power and Cheyenne Light determined the
11 Corriedale Project would best serve the sustainability goals of customers while balancing
12 the cost considerations for non-subscribing customers. This evaluation is discussed in
13 more detail in the testimony of Kyle White (Exhibit 12).

14 **Q. PLEASE DESCRIBE THE ENGINEERING DESIGN PROCESS FOR THE**
15 **CORRIEDALE PROJECT.**

16 A. Black Hills Power and Cheyenne Light have created a preliminary design for the
17 Corriedale Project. The Corriedale Project will be located approximately 6 miles west of
18 Cheyenne, adjacent to Interstate 80 and will occupy approximately 5,000 acres of land.
19 The Corriedale Project will include 16 - 2.5 MW General Electric (or equivalent) wind
20 turbine generators, with a total nominal capacity of 40 MW. Exhibit 2 to the Application
21 provides a preliminary engineering design drawing of the Corriedale Project. The final
22 design is expected to be completed by June of 2019 and will be provided in this Docket.

1 **Q. WHAT MECHANICAL AND ELECTRICAL SYSTEMS ARE PART OF THE**
2 **FACILITY?**

3 A. The wind turbine generator (“WTG”) is the primary mechanical system, consisting of
4 three blades and a nacelle that houses the hub, gearbox, and generator. The generator will
5 produce energy at the 600 volt level, and a pad-mounted step-up transformer will then
6 transform the generator voltage up to 34.5kV for electrical power transmission through
7 underground electric cable to the collector substation, where a generator step-up
8 transformer ("GSU") will then transform the voltage up to the interconnection voltage of
9 115kV. The collector substation’s main components will include (2) 34.5 kV feeder
10 breakers, (5) 34.5 kV disconnect switches, (1) 115 kV line breaker, (1) 115 kV line
11 disconnect switch, a GSU transformer, instrument transformers and a prefabricated
12 control enclosure. The substation will also utilize a copper ground grid installed below
13 the substation with a crushed rock surface layer to maintain the safety of personnel by
14 reducing the level of step and touch potentials.

15 **Q. WHAT CIVIL AND STRUCTURAL WORKS ARE PART OF THE FACILITY?**

16 A. Each of the 16 WTGs will be supported by a structural steel tower with a height of 89
17 meters, or approximately 262 feet. Each tower’s base is supported by a reinforced
18 concrete foundation that is custom-designed for the soil conditions at each turbine
19 location. Each foundation will have a spread footing below grade that is approximately
20 65 feet by 65 feet in size. A 36 foot wide access road will be utilized during construction
21 to allow crane movement on the roads and to provide adequate drainage, with a total
22 length of approximately 11.5 miles. The permanent road width of 16 feet will be restored
23 following completion of construction.

1 **Q. PLEASE DESCRIBE THE WTGS.**

2 A. The 16 WTGs will each have a nameplate capacity of approximately 2.5 MW (gross). As
3 wind is an intermittent renewable resource, the actual energy production will vary based
4 on the environmental conditions. Each WTG has three blades with a rotor diameter of
5 127 meters, or 417 feet. The hub height will be 89 meters, or 292 feet. The turbine tip
6 height is then approximately 500 feet.

7 **Q. HOW WILL THE CORRIEDALE PROJECT BE MANAGED?**

8 A. The construction of the Corriedale Project will be managed by Black Hills Service
9 Company, an affiliate of Black Hills Power and Cheyenne Light. Black Hills Service
10 Company successfully constructed and began operating the 29 MW Busch Ranch Wind
11 Project in 2012 and is currently preparing to construct the 60 MW (nominal) Busch
12 Ranch II Wind Project.

13 **Q. WHAT ARE THE KEY MILESTONES IDENTIFIED FOR THE CORRIEDALE**
14 **PROJECT?**

15 A. As part of the construction process, the Corriedale Project has several key milestones.
16 The first key milestone is the initiation of the project which includes determining general
17 project requirements related to safety, environmental, regulatory, engineering, and legal.
18 Next, the project baseline is created, including scope, schedule, and cost estimate. Next,
19 contracts will be executed for materials and construction services. The project will be
20 constructed and then placed in service as part of the start-up process. Finally, the project
21 team will close out the Corriedale Project with a final review of the project execution
22 compared to the project plan, including any lessons learned for incorporation into future
23 projects.

1 **V. PROJECT COSTS**

2 **Q. WHAT IS THE ESTIMATED COST OF THE CORRIEDALE PROJECT?**

3 A. The estimated cost of the Corriedale Project is approximately \$57 million. A detailed
4 project cost estimate is included as Confidential Attachment JH-1. This cost estimate is
5 based on the design basis document that was developed to identify all required systems
6 and major equipment of the project. In addition, vendor proposals, current equivalent
7 project costs and known site development costs were taken into consideration in
8 developing this estimate. A summary of the major project budget categories is below:

Category	Budgeted Amount in Millions
Construction	\$15.43
Major Equipment	\$35.35
Professional Services	\$0.65
Indirect Costs	\$4.09
AFUDC	\$1.46
Total	\$56.98

9
10 **Q. HOW WAS THE PROJECT ESTIMATE DEVELOPED?**

11 A. The Corriedale Project estimate was developed internally and verified by the internal
12 financial management team. The internal team identified major aspects of the project and
13 compiled budgetary expectations on construction materials.

14 **Q. WILL THE PROJECT ESTIMATE BE UPDATED PRIOR TO**
15 **CONSTRUCTION?**

16 A. Yes. The estimate will be reevaluated once contracts have been secured for construction,
17 materials, inspection, etc. The revised estimate will become the baseline estimate and

1 will be used to compare the actual costs following construction with the estimated costs
2 of the project.

3 **Q. WHO WILL OWN THE FACILITY?**

4 A. Cheyenne Light and Black Hills Power will own Corriedale up to the point of
5 interconnection to the West Cheyenne Substation which is to be constructed. Corriedale
6 will be owned, by undivided interest, 50% by Cheyenne Light and 50% by Black Hills
7 Power.

8 **Q. HOW WILL FUTURE OPERATING AND MAINTENANCE COSTS BE
9 ALLOCATED?**

10 A. The operation and maintenance for Corriedale will be managed by Black Hills Service
11 Company through a third-party Service and Maintenance Agreement. Operating and
12 maintenance costs will be allocated to Black Hills Power and Cheyenne Light based on
13 percentage of ownership.

14 **VI. SITE DESCRIPTION**

15 **Q. PLEASE DESCRIBE THE PROPOSED SITE FOR THE FACILITY.**

16 A. The proposed site for the facility is located in Laramie County, Wyoming, approximately
17 6 miles west of Cheyenne, adjacent to Interstate 80. The site consists of approximately
18 5,000 acres. The legal description and boundary map of the project site, including a
19 metes and bounds description, is set forth in Attachment JH-3. A map is attached as
20 Exhibit 1 to the Application. The site is bordered to the west by the Happy Jack and
21 Silver Sage Windpower project sites, to the north by King Ranch Company, state land,
22 and City of Cheyenne land, to the south by Dyson Family Trust, King Ranch Company
23 and other land owners, and to the east by state land and King Ranch Company.

1 **Q. WHAT FACTORS WERE CONSIDERED WHEN DETERMINING WHERE TO**
2 **BUILD THE FACILITY?**

3 A. The main factors considered include the availability of wind energy resources, the
4 proximity to Cheyenne Light's transmission system, and the availability of land for wind
5 energy development.

6 **Q. PLEASE DESCRIBE THE VARIOUS TYPES OF LAND ON WHICH THE**
7 **FACILITY WILL BE CONSTRUCTED.**

8 A. The proposed site of the Corriedale Project is presently grassland, and the current land
9 use is grazing and oil development. The parcel is characterized by gently rolling hills
10 ranging from 6,500 to 6,800 feet above sea level.

11 **Q. WHAT LAND RIGHTS ARE BLACK HILLS POWER AND CHEYENNE LIGHT**
12 **PURSUING RELATED TO THE SITE?**

13 A. The site of the Corriedale Project is owned by one private landowner, King Ranch
14 Company. Black Hills Power and Cheyenne Light are in the process of securing a long-
15 term lease agreement. Acquisition of the lease is expected by the first quarter of 2019.
16 Black Hills Power and Cheyenne Light will provide an update in this docket when a lease
17 is executed.

18 **VII. ENVIRONMENTAL AND CONSTRUCTION PERMITTING**

19 **Q. HAS A PHASE 1 ENVIRONMENTAL ASSESSMENT BEEN COMPLETED FOR**
20 **THE PROPOSED PROJECT SITE?**

21 A. Yes. The Phase 1 Environmental Assessment is included with the Application as Exhibit
22 7. The Phase 1 Environmental Assessment identified four environmental conditions at
23 the site of the Corriedale Project.:

1 1. Contaminated groundwater - The U.S. Department of Defense has placed
2 monitoring wells on the southern portion of the property area to track trichloroethylene
3 contamination in groundwater associated with a former missile site located approximately
4 12 miles east of the subject property. This situation is an existing release to the
5 environment.

6 2. 500-gallon diesel underground storage tank - The property owner disclosed that
7 there is an approximately 20-year old underground storage tank on-site that is still in use.
8 The property owner did not have any documentation on the tank. The age and lack of
9 documentation is indicative of an existing release and/or poses a material threat of a
10 release to the environment.

11 3. Dump area - An area in the northeast portion of the property is used to store
12 inoperable vehicles and machinery. The vehicles are lined up in an orderly manner, but
13 oil and other fluids can leak onto the ground over time. This situation poses a material
14 threat of a future release to the environment.

15 4. The presence of lead bullet fragments in soil at the gun range. This situation is
16 an existing release to the environment.

17 **Q. WHAT IS THE IMPACT OF THE IDENTIFIED RECOGNIZED**
18 **ENVIRONMENTAL CONDITIONS?**

19 **A.** The identified Recognized Environmental Conditions are unrelated to Black Hills Power
20 and Cheyenne Light as the companies do not own the property. The Recognized
21 Environmental Conditions will not have any material impact on the Corriedale Project
22 and the project will not have any impacts on the recognized environmental conditions.

23

1 **Q. WHAT PERMITS HAVE BEEN ACQUIRED FOR THE PROPOSED PROJECT?**

2 A. The necessary permitting that will be required for this project are as follows:

Agency	Required Permit and Regulatory Reviews
Wyoming Department of Environmental Quality	Hydrostatic Discharge Permit
Wyoming Department of Environmental Quality	Large Construction Activity Permit - Storm Water Permit
U.S. Army Corps of Engineers	Review of Potentially Affected Waterways
United States Fish and Wildlife Service	Endangered and Threatened Species Review
Wyoming Game & Fish Department	Endangered and Threatened Species Review

3
4 Black Hills Power and Cheyenne Light will obtain the required permits upon approval of
5 this CPCN and prior to construction of the Corriedale Project.

6 **VIII. CONSTRUCTION TIMELINE**

7 **Q. PLEASE PROVIDE AN APPROXIMATE TIMELINE FOR THE**
8 **CONSTRUCTION OF THE CORRIEDALE PROJECT.**

9 A. Following Commission approval of the Application, Black Hills Power and Cheyenne
10 Light plan to order major materials and complete construction in order to have the
11 Corriedale Project in service by September 30, 2020. Based on this commercial
12 operation date, major construction activities are anticipated to commence during the first
13 quarter of 2020 after all necessary permits are received. In order to complete
14 construction by the proposed commercial operation date, the wind turbines will have to
15 be ordered by August 1, 2019. Ordering the turbines will be a non-refundable cost of
16 approximately \$7 million for the project. The construction phase is scheduled to last
17 approximately 7 months. During the spring of 2020, it is anticipated that construction

1 activities will consist of equipment mobilization and preliminary site work including
 2 clearing, leveling, and grading work. Major construction activities will commence in the
 3 second quarter of 2020 with the completion of structural foundations and access roads.
 4 WTG deliveries are anticipated in the third quarter of 2020, with turbine erection being
 5 completed as the components are delivered. This estimated schedule is based on recent
 6 experience with construction of similar facilities. The following chart shows expected
 7 completion dates for phases of the project:

Task / Topic	Expected Completion
Landowner Agreement	Q1 2019
Order Placed for Turbines	August 1,2019
Final Project Design	Q4 2019
Major Equipment Delivery	Q2 and Q3, 2020
Environmental Permits	Q1 2020
Construction Complete	September 2020

8
 9 Attachment JH-2 provides a detailed schedule of the construction milestones for
 10 the Corriedale Project.

11 **IX. CONCLUSION**

12 **Q. PLEASE PROVIDE A SUMMARY OF YOUR TESTIMONY IN SUPPORT OF**
 13 **THE CORRIEDALE PROJECT CPCN FILING.**

14 A. The Corriedale Project is a 40 MW wind energy facility that will be located just west of
 15 Cheyenne and owned by Black Hills Power and Cheyenne Light. The Corriedale Project
 16 will take approximately seven months to construct and has an expected commercial
 17 operation date of September 30, 2020. The approximate cost of the Corriedale Project is
 18 \$57 million with Black Hills Power and Cheyenne Light bearing the cost in proportion to

1 their respective ownership interests. Black Hills Power and Cheyenne Light will update
2 this docket with the final project design, landowner agreement and necessary permits
3 when they are received.

4 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

5 **A. Yes, it does.**

6

