

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

**IN THE MATTER OF THE
APPLICATION OF DEUEL HARVEST
WIND ENERGY LLC FOR A PERMIT
OF A WIND ENERGY FACILITY AND A
345-KV TRANSMISSION LINE IN
DEUEL COUNTY**

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**DEUEL HARVEST WIND ENERGY
LLC'S PROPOSED FINDINGS OF
FACT, CONCLUSIONS OF LAW AND
ORDER**

EL18-053

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EL18-053

APPEARANCES

Commissioners Gary Hanson, Kristie Fiegen, and Chris Nelson.

Mollie Smith, Lisa Agrimonti, and Haley Waller Pitts, Fredrikson & Byron, P.A., 200 South Sixth Street, Minneapolis, Minnesota 55402, appeared on behalf of the Applicant, Deuel Harvest Wind Energy LLC (“Deuel Harvest” or “Applicant”).

Kristen Edwards and Amanda Reiss, 500 E. Capitol Ave., Pierre, South Dakota 57501, appeared on behalf of the South Dakota Public Utilities Commission Staff (“Staff”).

Thomas Welk, Boyce Law Firm, LLC, 300 S. Main Ave., Sioux Falls, South Dakota 57104, appeared on behalf of Otter Tail Power Company (“Otter Tail”).

Garrett Homan appeared on behalf of himself.

John Homan appeared on behalf of himself.

John Henslin appeared on behalf of himself.

Christina Kilby appeared on behalf of herself.

Heath Stone appeared on behalf of himself.

Will Stone appeared on behalf of himself.

PROCEDURAL HISTORY

On November 30, 2018, Deuel Harvest filed an Application for Energy Facility Permits (with appendices) for the up to 310.1 megawatt (“MW”) Deuel Harvest North Wind Farm wind energy conversion facility (“Wind Farm” or “Project”) and 345-kilovolt (“kV”) transmission line

with associated 345-kV interconnection substation (“Transmission Facility”) to be located entirely within Deuel County, South Dakota.¹ Also on November 30, 2018, Deuel Harvest filed the prefiled direct testimony of Michael Svedeman, Andrea Giampoli, JoAnne Blank, Michael Hankard, and Michael MaRous.

On December 3, 2018, Deuel Harvest filed revised Appendices J, L, O, P, Q, and R.

On December 6, 2018, Deuel Harvest filed certificates of service confirming it had sent copies of the Application and pre-filed direct testimony to the Commission and to the Deuel County Auditor.

On December 12, 2018, the Commission issued a Notice of Application; Order for and Notice of Public Input Hearing; and Notice of Opportunity to Apply for Party Status.

On December 18, 2018, the Commission issued an Order assessing Deuel Harvest a filing fee in an amount not to exceed \$400,000 with an initial deposit of \$8,000. In the same Order, the Commission further voted to authorize the executive director to enter into necessary consulting contracts.

On January 16, 2019, Affidavits of Publication were filed confirming that the Notice of Public Hearing was published in the *Watertown Public Opinion* on December 21 and 27, 2018 and in the *Clear Lake Courier* on December 19 and 26, 2018.

On January 23, 2019, Deuel Harvest filed a revised Appendix D.

On January 24, 2019, a public input hearing was held as scheduled.

On January 25, 2019, Staff submitted a Motion for Adoption of Procedural Schedule.

On January 28, 2019, Deuel Harvest filed the PowerPoint presentation that was presented at the public input meeting on January 24, 2019.

On January 31, 2019, Deuel Harvest filed a Response to Motion for Adoption of Procedural Schedule.

The Commission received ten applications for party status by the January 29, 2019 deadline.

On February 4, 2019, Affidavits of Publication were filed confirming that the Notice of Public Hearing was published in the *Watertown Public Opinion* and in the *Clear Lake Courier* on December 26, 2018 and January 23, 2019.

On February 5, 2019, the Commission issued an Order Granting Party Status and Establishing Procedural Schedule. The Commission granted party status to: John Homan, Jon Henslin, Nancy Henslin, Christina Kilby, Will Stone, Garrett Homan, Heath Stone, George Holborn, Ruby Holborn, and Otter Tail Power Company.

¹ See Ex. A1 (Application).

On February 14, 2019, Deuel Harvest filed the prefiled supplemental testimony of: Michael Svedeman, Andrea Giampoli, Michael Hankard, Dr. Mark Roberts, Dr. Jeffrey Ellenbogen, JoAnne Blank, and Jacob Baker.

From February 20 to February 28, 2019, the following parties filed Withdrawals of Party Status: Nancy Henslin, Ruby Holborn, and George Holborn.

On March 6, 2019, the Commission issued an Order Granting Withdrawal of Party Status for the following persons: Nancy Henslin, George Holborn and Ruby Holborn.

On March 7, 2019, Staff filed an email sent to all parties containing an explanation of the Commission's prefiled testimony process.

On March 8, 2019, Intervenor Kilby filed a Motion for Denial of Deuel Harvest's Application. Intervenor Kilby's supporting Brief and Affidavit were posted to the docket on March 11, 2019. On March 12, 2019, Intervenor Garrett Homan filed a Letter in Support of Motion for Denial.

On March 11, 2019, the Commission issued an Order for and Notice of Evidentiary Hearing.

On March 14, 2019, Staff filed prefiled direct testimony of David Hessler, Tom Kirschenmann, Paige Olson, and Jon Thurber.

Also on March 14, 2019, Intervenor Garrett Homan filed prefiled direct testimony of Garrett Homan and Kevin Elwood. Intervenor Otter Tail filed prefiled direct testimony of Dean Pawlowski. Intervenor Heath Stone filed prefiled direct testimony. Intervenor Kilby filed prefiled direct testimony.

On March 15, 2019, Intervenor Will Stone filed prefiled direct testimony. Intervenor John Homan filed prefiled direct testimony.

Also on March 15, 2019, Intervenor Heath Stone filed a Letter in Support of Motion for Denial.

On March 19, 2019, Intervenor John Homan filed the prefiled direct testimony of George Holborn.

On March 19, 2019, the Commission issued an Order for and Notice of Motion Hearing on Less Than 10 Days' Notice, ruling that a hearing on the Motion for Denial would be held at an ad hoc meeting on March 27, 2019.

On March 20, 2019, Deuel Harvest filed a Response to Intervenor Kilby's Motion for Denial.

On March 26, 2019, Intervenor John Henslin filed Comments in Support of Motion for Denial.

On March 26, 2019, Intervenor Kilby filed a Reply Brief in Support of Motion to Deny.

On March 27, 2019, Intervenor Garrett Homan filed Additional Information in Support of Motion for Denial.

On March 28, 2019, Deuel Harvest filed a Motion to Exclude Portions of Testimony and/or Exhibits of Intervenors. Attachment A to Deuel Harvest's Motion was filed on March 29, 2019.

On March 29, 2019, the Commission issued an Order Denying Motion for Denial.

On April 1, 2019, Intervenor John Homan filed a request for the Commission to issue subpoenas for Kevin DeBoer, Lynn Pederson, Dennis Kanengieter, Gary Jaeger, John Knight, and Jodi Theisen.

On April 1, 2019, Staff filed rebuttal testimony of Jon Thurber.

Also on April 1, 2019, Deuel Harvest filed rebuttal testimony of Michael Svedeman, Andrea Giampoli, Jacob Baker, Michael Hankard, Dr. Jeffrey Ellenbogen, JoAnne Blank, Michael MaRous, Benjamin Doyle, Cody Kenyon, and Doyle Thompson.

Also on April 1, 2019, Intervenor Garrett Homan filed rebuttal testimony, and Intervenor Kilby filed rebuttal testimony of Intervenor Kilby and Robert Rand.

On April 2, 2019, Intervenor John Homan filed rebuttal testimony.

On April 2, 2019, Intervenor Kilby filed a Motion to Allow Robert Rand to Appear Telephonically.

On April 2, 2019, Deuel Harvest filed a Motion to Exclude Testimony Related to Local Land Use Decisions.

On April 3, 2019, Intervenor Garrett Homan filed a Motion to Allow Kevin Elwood to Appear Telephonically.

Also on April 3, 2019, Intervenor Kilby filed a Motion to Compel Deuel Harvest's Responses and Production of Documents.

On April 3, 2019, Deuel Harvest filed a letter to amend its Motion to Exclude Portions of Testimony and/or Exhibits of Intervenors dated March 28, 2019.

On April 4, 2019, the Commission issued an Order for and Notice of Motion Hearing on Less Than 10 Days' Notice, ruling that a hearing on Intervenor Kilby's Motion to Allow Robert Rand to Appear Telephonically, Intervenor Garrett Homan's Motion to Allow Kevin Elwood to Appear Telephonically, Deuel Harvest's Motion to Exclude Testimony Related to Local Land Use Decisions, Deuel Harvest's Motion to Exclude Portions of Testimony and/or Exhibits of Intervenors, and Intervenor Kilby's Motion to Compel Deuel Harvest's Responses and Production of Documents would be held at an ad hoc meeting on April 10, 2019.

On April 4, 2019, Staff filed a Response to Deuel Harvest's Motion to Exclude Portions of Testimony and/or Exhibits of Intervenors.

On April 8, 2019, Staff filed a Response to Deuel Harvest's Motion to Exclude Testimony Related to Local Land Use Decisions, and a Response to Christina Kilby's and Garrett Homan's Motions to Allow Telephonic Testimony.

On April 8, 2019, Intervenor John Homan filed a Response to Dennis Evenson.

On April 8, 2019, Intervenor Kilby filed a Brief in Opposition to Deuel Harvest's Motion to Exclude Testimony and/or Exhibits of Intervenors.

On April 9, 2019, Intervenor Kilby filed a Response Regarding Christina Kilby's Motion to Compel. Intervenor Kilby also filed an Argument in Opposition of Deuel Harvest's Motion to Exclude Testimony Related to Local Land Use Decision.

On April 9, 2019, Deuel Harvest filed a Response to Intervenor Kilby's April 2, 2019 Motion to Allow Robert Rand to Appear Telephonically and Intervenor Garrett Homan's April 3, 2019 Motion to Allow Kevin Elwood to Appear Telephonically. Deuel Harvest also filed a Response to Intervenor Kilby's Motion to Compel Deuel Harvest's Responses and Production of Documents.

On April 10, 2019, Intervenor Otter Tail filed prefiled supplemental testimony of Dean Pawlowski.

On April 11, 2019, the Commission issued an Order Granting Motions to Allow Robert Rand and Kevin Elwood to Appear Telephonically.

Also on April 11, 2019, the Commission unanimously issued an Order Granting Motion to Exclude Testimony Related to Local Land Use Decisions as It Relates to the Invalidated Special Exception Permit of Deuel Harvest; Order Allowing John Homan's Subpoenaed Witnesses to Testify Only for Rebuttal and/or Impeachment Purposes.

Also on April 11, 2019, the Commission issued an Order Granting, in Part, Motion to Exclude Portions of Testimony and/or Exhibits of Intervenors, in accordance with the recommendations found in Staff's April 4, 2019, Response.

Also on April 11, 2019, Deuel Harvest filed prefiled surrebuttal testimony for Michael Hankard and Dr. Jeffrey Ellenbogen.

On April 12, 2019, the Commission issued an Order Granting, in Part and Denying in Part the Motion to Compel.

On April 10, 2019, Staff filed Exhibits S2 (public) through S4 for hearing. On April 11, 2019, Staff filed Exhibits S1, S2 (confidential), and S5, S6, and S7 (public). On April 12, 2019, Staff filed its Witness List and Exhibit List and Exhibit S7 (confidential). On April 17, 2019, Staff filed Exhibit S8.

On April 11, 2019, Deuel Harvest filed its exhibits for hearing.² On April 12, 2019, Deuel Harvest filed its Witness List and Exhibit List and additional exhibits for hearing (Exhibits A26 through A31-6). On April 15, 2019, Deuel Harvest filed Exhibits A32 and A33. On April 16, 2019, Deuel Harvest filed Exhibits A34 through A37. On April 17, 2019, Deuel Harvest filed Exhibits A38 and A39.³ On April 18, 2019, Deuel Harvest filed revised Exhibit A31-3 and Exhibits A40 through A46.

On April 11 and 12, 2019, Intervenor Kilby filed Exhibits K1⁴ through K26 for hearing. On April 13, 2019, Intervenor Kilby filed her Revised Witness List and Exhibit List and Exhibits K27 and K28. On April 18, 2019, Intervenor Kilby filed Exhibits K29 and K30.⁵

On April 11, 12, and 13, 2019, Intervenor John Homan filed his Witness List and Exhibit List and Exhibits JH1 through JH22, JH25 through JH30, and JH32. On April 15, 2019, Intervenor John Homan filed Exhibit JH31.

On April 11 and 12, 2019, Intervenor Heath Stone filed Exhibits HS1 through HS12 for hearing.

On April 12, 2019, Intervenor Garrett Homan filed his Witness List and Exhibit List and Exhibits G1 through G29 for hearing. On April 17 and 18, 2019, Intervenor Garrett Homan filed Exhibits G30 through G32.

On April 12, 2019, Otter Tail filed its Witness List and Exhibit List and Exhibits OT1 and OT2 for hearing.

On April 12 and 13, 2019, Intervenor Jon Henslin filed Exhibits JW1 through JW8 for hearing.

On April 13, 2019, Intervenor Will Stone filed Exhibit WS1 for hearing. On April 18, 2019, Intervenor Will Stone filed Exhibits WS2 and WS4. Also on April 18, 2019, Deuel Harvest filed Revised Exhibit WS2.

The evidentiary hearing was held before the Commission on April 15-18, 2019 in the Drifters Event Center, 325 E. Hustan Ave., Fort Pierre, South Dakota.

At the evidentiary hearing on April 15, 2019, the Commission voted to approve a Stipulation agreed to by Staff, Deuel Harvest, and Otter Tail, submitted as Exhibit A33, regarding the switching station and the conclusion that a facility permit from the Commission is

² Deuel Harvest filed Exhibits A2 through A25. The Application was marked as Exhibit A1 but was not refiled.

³ Ex. A39 contains updated Figures A-2 and A-4 showing receptors. Participating landowner Mr. Cody Kenyon's residence was considered in the design of the Project, but was omitted from Figures A-2 and A-4 submitted with the Application. As explained by Mr. Svedeman at the evidentiary hearing, in response to Mr. Kenyon's interest in having a turbine closer to his home than the 1,500 foot setback required by Deuel County, Deuel Harvest worked with Mr. Kenyon to evaluate the possibility of seeking a variance and in doing so, removed the receptor indicator on Mr. Kenyon's residence. Deuel Harvest added Mr. Kenyon's residence to the updated Figures A-2 and A-4 (Ex. A39) prior to the evidentiary hearing.

⁴ Evid. Hrg. Tr. at 193, 195-97 (April 18, 2019) (Draft Transcript).

⁵ Evid. Hrg. Tr. at 193, 195-97 (April 18, 2019) (Draft Transcript).

not required for the 345-kV transmission line (“Gen-Tie”) that Deuel Harvest will construct, own and operate between Deuel Harvest’s Project Substation and Otter Tail’s facilities. Otter Tail’s Facilities consist of: a switching station (“Switching Station”) and a segment of a 345-kV transmission line located from the Switching Station to the first structure outside the Switching Station (“Otter Tail’s Facilities”). Otter Tail’s Facilities will be constructed, owned, and operated by Otter Tail and are needed to interconnect Deuel Harvest’s Project Substation and Gen-Tie to the Big-Stone South to Brookings 345-kV transmission line.⁶

On April 29, 2019, Deuel Harvest filed a Proof of Mailing to affected landowners demonstrating compliance with the requirements of South Dakota Codified Law 49-41B-5.2.

On May 1, 2019, in accordance with the Hearing Examiner’s decision regarding the striking of portions of Intervenor Kilby’s Exhibits K1-K8, K29, and K30, Deuel Harvest filed the redacted versions of Intervenor Kilby’s Exhibits K1-K5, K8, and K29.

Having considered the evidence of record, applicable law, and the briefs and arguments of the parties, the Commission makes the following Findings of Fact, Conclusions of Law, and Order:

FINDINGS OF FACT

I. PROCEDURAL FINDINGS.

1. The Procedural History set forth above is hereby incorporated by reference in its entirety in these Procedural Findings. The procedural findings set forth in the Procedural History are a substantially complete and accurate description of the material documents filed in this docket and the proceedings conducted and decisions rendered by the Commission in this matter.

II. PARTIES.

2. The Applicant, Deuel Harvest Wind Energy LLC, is a Delaware limited liability company and is wholly owned by Invenergy LLC (“Invenergy”).⁷ Deuel Harvest Wind Energy LLC is registered to conduct business in South Dakota as a foreign limited liability company.⁸

3. Invenergy is a privately held Delaware limited liability company headquartered in Chicago, Illinois.⁹ Invenergy develops, builds, owns, and operates large-scale power plants across four core technologies: wind (90 projects, 12,864 MW); natural gas (11 projects, 5,642 MW); solar (25 projects, 2,150 MW); and battery storage (5 projects, 72 MW). Invenergy has a proven development track record of 131 large-scale projects, and currently provides wind turbine operations and maintenance services on more than 3,400 wind turbines currently in operation. As part of Invenergy’s various generation projects, Invenergy has permitted and built 414 miles of transmission lines greater than 69-kV and continues to operate 182 miles of those lines.¹⁰

⁶ See Evid. Hrg. Tr. at 15-16 (April 15, 2019) (Draft Transcript) and Ex. A33 (Stipulation).

⁷ Ex. A1 at 4-1 (Application).

⁸ Ex. A1 at 5-1 (Application).

⁹ Ex. A1 at 4-1 (Application).

¹⁰ Ex. A1 at 1-2 (Application).

4. Intervenor Otter Tail is headquartered in Fergus Falls, Minnesota and is a subsidiary of Otter Tail Corporation, which has its headquarters in Fargo, North Dakota. Otter Tail provides retail electric service to approximately 132,100 customers, including approximately 11,700 in South Dakota, 61,700 in Minnesota, and 58,800 in North Dakota. In South Dakota, Otter Tail is the operator and majority owner of the Big Stone Power Plant, located near Big Stone, South Dakota and is an approximately 50 percent owner in the Big Stone South to Brookings and Big Stone South-to-Ellendale 345-kV transmission projects.¹¹

5. Intervenor Heath Stone is a landowner and resides in Deuel County.

6. Intervenor Will Stone is a landowner and resides in Deuel County.

7. Intervenor John Homan is a landowner in Deuel County and resides in Watertown, South Dakota.

8. Intervenor John Henslin is a landowner and resides in Deuel County.

9. Intervenor Garrett Homan resides in Hermantown, Minnesota.

10. Intervenor Christina Kilby resides in Burnsville, Minnesota.

11. Staff fully participated as a party in this matter, in accordance with SDCL 49-41B-17.

III. PROJECT DESCRIPTION.

12. The proposed Project is a wind energy conversion facility located in Deuel County, South Dakota.¹² The Project will have a nameplate capacity of up to 310.1 MW and will generate up to 300 MW of electricity.¹³ The proposed Project includes up to 112 wind turbines, access roads to turbines and associated facilities, underground 34.5-kV electrical collector lines connecting the turbines to the collection substation, underground fiber-optic cable for turbine communications co-located with the collector lines, an operations and maintenance (“O&M”) building, up to four permanent meteorological (“MET”) towers, Aircraft Detection Lighting System (“ADLS”) facilities, a 34.5 to 345-kV collection substation (“Project Substation”), and additional temporary construction areas, including crane paths, public road improvements, a laydown yard, and a concrete batch plant(s) (as needed).¹⁴

13. Deuel Harvest will also construct, own and operate a 345-kV transmission line Gen-Tie between Otter Tail’s Facilities (defined below) and Deuel Harvest’s Project Substation. The Gen-Tie will be less than one-half mile long, it will not cross a public highway, and eminent

¹¹ Ex. OT1 at 1 (Pawlowski Direct).

¹² Ex. A1 at 1-1 (Application).

¹³ Ex. A1 at 8-1 (Application).

¹⁴ Ex. A1 at 1-1 (Application).

domain will not be used to acquire the right-of-way for the Gen-Tie.¹⁵ No permit needs to be issued by the Commission for construction, ownership, and operation of the Gen-Tie.¹⁶

14. Otter Tail will construct, own, and operate a Switching Station needed to interconnect Deuel Harvest's Project Substation and Gen-Tie to the Big Stone South to Brookings 345-kV transmission line. Otter Tail also will construct, own, and operate a segment of a 345-kV transmission line between the Gen-Tie and the Switching Station. Specifically, Otter Tail will own and operate that portion of the 345-kV transmission line located from the Switching Station to the first structure outside the Switching Station. The transmission line owned by Otter Tail will be less than one-half mile long, it will not cross a public highway, and Otter Tail will not utilize eminent domain to acquire the right-of-way for the transmission line. The Switching Station and the portion of the 345-kV transmission line owned by Otter Tail are collectively referred to as Otter Tail's Facilities.¹⁷ No permit needs to be issued by the Commission for construction, ownership, and operation of Otter Tail's Facilities.¹⁸

15. Deuel Harvest has entered into a Generator Interconnection Agreement ("GIA") with Otter Tail and the Midcontinent Independent System Operator, Inc. ("MISO").¹⁹ The Project will interconnect to the regional electric grid along the Big Stone South to Brookings 345-kV transmission line and will be able to deliver 300 MW of electricity.²⁰

16. The Project Area consists of approximately 41,980 acres of leased land, of which up to approximately 68 acres will be developed for permanent facilities.²¹ The Project is located entirely within Deuel County in the townships of Portland, Lowe, Altamont, Glenwood, Herrick, and Antelope Valley.²²

17. The current estimated capital cost of the Project is approximately \$400 million based on indicative construction and wind turbine pricing cost estimates for the proposed turbine layout. This estimate includes lease acquisition, permitting, engineering, procurement, and construction of turbines, access roads, underground electrical collector system, a Project Substation, Transmission Facility, an O&M building, a supervisory control and data acquisition ("SCADA") system, and up to four permanent MET towers; and tax payments, landowner payments, and Project financing. The Wind Farm has a current estimated capital cost of \$387 million, and the Transmission Facility has a current estimated capital cost of \$13 million.²³ The overall cost of developing the Project depends primarily on site selection and construction timing. Site-dependent costs will include access to the individual wind turbine locations, site-specific subsurface conditions that determine foundation design, access road design and layout, ease of underground work, and the layout of the turbine arrays, which affects road and electrical cable cost.²⁴ Ongoing O&M costs and administrative costs are estimated to be approximately

¹⁵ Ex. A33 at 2 (Stipulation).

¹⁶ Ex. A33 at 2 (Stipulation).

¹⁷ Ex. A33 at 1-2 (Stipulation).

¹⁸ Ex. A33 at 2 (Stipulation).

¹⁹ Ex. OT1 at 7 (Pawlowski Direct).

²⁰ Ex. A1 at 1-1 (Application).

²¹ Ex. A1 at 9-1 (Application).

²² See Ex. A1 at Figure A-1 (Application); Ex. A14-1 (Updated Project Layout).

²³ Ex. A1 at 7-1 (Application).

²⁴ Ex. A1 at 7-1 (Application).

\$8.5 million per year, including payments to landowners for wind lease and easement rights, and taxes related to the capacity and generation of the Project.²⁵

18. Deuel Harvest proposes to erect up to 112 wind turbines for the Project, which will be comprised of two turbine models. One of the turbine models will be the GE 2.3-116 turbine, a 2.3 MW turbine with an 80-meter hub height and 116-meter rotor diameter (“RD”). These turbines qualify the Project for the Production Tax Credit (“PTC”). The other proposed turbine model that will be utilized for the Project is anticipated to be the GE 2.82-127, a 2.82 MW turbine with an 88.6-meter hub height and 127-meter RD. The total number of turbines will be dependent on the final combination of turbine models.²⁶ Deuel Harvest requested the Commission provide flexibility for the Project to use a turbine of comparable capacity and specifications, so long as the new model complies with all other applicable regulations and Permit requirements.²⁷ Deuel Harvest demonstrated that this turbine model flexibility is necessary.²⁸ Further, Deuel Harvest has committed to the process outlined in Condition 22 of Applicant’s and Staff’s Proposed Permit Conditions for addressing the change in turbine model and demonstrating compliance with all of the conditions of the permit for the Project.²⁹

19. All turbines will be constructed within the Project Area consistent with the configuration presented in Exhibit A14-1 (Updated Project Layout) and subject to all commitments, conditions, and requirements of the Commission’s Order.

20. Deuel Harvest presented evidence of consumer demand and need for the Project.³⁰ Deuel Harvest does not currently have a purchase agreement or off-take agreement for the Project but is currently negotiating two power purchase agreements with utilities. At the time of hearing, those negotiations were still in process and were confidential.³¹ The electricity generated by the Project would be used as needed on the MISO regional grid and will help MISO operators meet electricity demand.³² The output from the facility will be used to meet the needs for the region’s electrical utilities and industrial, commercial, and residential customers.³³

21. With regard to micro-siting, Deuel Harvest provided evidence to support the need for turbine and associated facility flexibility.³⁴ With respect to turbine flexibility, Deuel Harvest and Staff agreed to the turbine flexibility and “material change” provisions set forth in Applicant’s and Staff’s Proposed Permit Condition 22.³⁵ With respect to the access roads, the collector and communications systems, meteorological towers, ADLS facilities, the O&M

²⁵ Ex. A1 at 7-1 (Application).

²⁶ Ex. A1 at 8-4 (Application).

²⁷ Ex. A1 at 8-4 (Application).

²⁸ See Ex. A1 at § 8.2 (Application); Ex. A2 at 7 (Svedeman Direct).

²⁹ Ex. A37 at ¶ 22 (Applicant’s and Staff’s Proposed Permit Conditions).

³⁰ See, e.g., Ex. A1 at Ch. 6.0 (Application).

³¹ Evid. Hrg. Tr. at 2 (April 16, 2019) (Draft Transcript) (Svedeman).

³² Ex. A1 at 6-1 (Application).

³³ Ex. A1 at 6-3 (Application).

³⁴ See, e.g., Ex. A1 at 8-2 – 8-3 (Application).

³⁵ Ex. A37 at ¶ 22 (Applicant’s and Staff’s Proposed Permit Conditions).

facility, the Project Substation, and temporary facilities, Deuel Harvest and Staff agreed to Condition 23 of Applicant's and Staff's Proposed Permit Conditions.³⁶

22. The record demonstrates that Deuel Harvest has made appropriate and reasonable plans for decommissioning.³⁷ With respect to financial security for decommissioning, Staff and Deuel Harvest have agreed to Condition 36 of Applicant's and Staff's Proposed Permit Conditions, which provides for a decommissioning escrow account.³⁸ Deuel Harvest and Staff also agreed to Condition 37 of Applicant's and Staff's Proposed Permit Conditions, which provides for financial security for decommissioning in the event Deuel Harvest is purchased by a utility that is rate regulated by the Commission.³⁹

23. The record demonstrates that Deuel Harvest has provided adequate information on potential cumulative impacts and that the Project will not have a significant impact.⁴⁰

IV. FACTORS FOR AN ENERGY FACILITY PERMIT.

24. Under the SDCL 49-41B-22, the Commission must find:

- (1) The proposed facility will comply with all applicable laws and rules;
- (2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;
- (3) The facility will not substantially impair the health, safety or welfare of the inhabitants; and
- (4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

25. In addition, SDCL 49-41B-25 provides that the Commission must make a finding that the construction of the facility meets all of the requirements of Chapter 49-41B.

26. There is sufficient evidence on the record for the Commission to assess the proposed Project using the criteria set forth above.

V. SATISFACTION OF REQUIREMENTS FOR ISSUANCE OF AN ENERGY FACILITY PERMIT.

³⁶ Ex. A37 at ¶ 23 (Applicant's and Staff's Proposed Permit Conditions).

³⁷ See Ex. A1 at Appendix U (Decommissioning Cost Analysis); Ex. A1 at Ch. 23 (Application); Ex. A2 at 21-22 (Svedeman Direct); Ex. A37 at ¶¶ 24, 37 (Applicant's and Staff's Proposed Permit Conditions).

³⁸ Ex. A37 at ¶ 36 (Applicant's and Staff's Proposed Permit Conditions).

³⁹ Ex. A37 at ¶ 37 (Applicant's and Staff's Proposed Permit Conditions).

⁴⁰ See, e.g., Ex. A1 at Ch. 10.0 (Application).

A. The proposed facility will comply with all applicable laws and rules.

27. The evidence submitted by Deuel Harvest demonstrates that the Project will comply with applicable laws and rules.⁴¹ Applicant and Staff have agreed to Condition 1, which provides that the Applicant “will obtain all governmental permits which reasonably may be required by any township, county, state or federal agency, or any other governmental unit for construction and operation activity of the Project prior to engaging in the particular activity covered by that permit.”⁴²

28. Intervenors assert that the Project is in violation of the Deuel County Ordinance because it is not set back two miles from Lake Alice and it is not set back four times the height of the turbine from Stone’s Conservation Acres.⁴³

29. Article VI of the Deuel County Ordinance provides that “all questions of interpretation and enforcement shall be first presented to the County Zoning Officer, and that such questions shall be presented to the Board of Adjustment only on appeal from the decision of the Zoning Officer[.]” Staff contacted the Deuel County Zoning Officer who advised that in Section 1215.03(2)(d) of the Ordinance “the setback was from the Lake Park District at Lake Alice, not from Lake Alice itself.”⁴⁴ Further, on April 16, 2019, Deuel Harvest submitted a request on April 16, 2019 to Deuel County requesting the Board of Adjustment’s interpretation regarding Section 1215.03(2)(d) as it relates to the setback from the Lake Park District at Lake Alice. The Commission has legislative direction to give due consideration to the views of governing bodies of affected local units of government pursuant to SDCL 49-41B-22(4).⁴⁵ Further, the County’s interpretation of its own ordinance is entitled to deference.⁴⁶ The Project is set back two miles from the Lake Park District at Lake Alice.⁴⁷

30. Deuel County Zoning Ordinance Section 1215.03(2)(A), establishes a setback from residences and businesses. Mr. Will Stone and Mr. Heath Stone argued that this provision of the Ordinance requires that wind turbines be set back at least four times the height of the turbine from the property boundary of the Stones Hunting Operation. Deuel Harvest asserts that the setback does not apply to the Stones Hunting Operation because there are no structures on the hunting preserve property. On April 16, 2019, Deuel Harvest submitted a request to the County for an interpretation confirming that “business” as used in Section 1215.03(2)(a) means a structure that can be occupied by humans. The County will interpret and apply this requirement when determining whether to grant an SEP for the Project. The Commission need not delve into this matter of local law.

⁴¹ See, e.g., Ex. A1 at 3-2 – 3-3, 8-4 – 8-5, 9-2 – 9-3, 16-1 (Application); Ex. A2 at 8-9, 22 (Svedeman Direct).

⁴² Ex. A37 at ¶ 1 (Applicant’s and Staff’s Proposed Permit Conditions).

⁴³ See, e.g., Evid. Hrg. Tr. at 102 (April 18, 2019) (Draft Transcript) (Kilby); Ex. K14 at 7 (Kilby); Evid. Hrg. Tr. at 79 (April 18, 2019) (Draft Transcript) (W. Stone); Ex. HS9 at 2 (H. Stone Responses to Staff’s First Set of Data Requests).

⁴⁴ Ex. S1 at 23 (Thurber Direct).

⁴⁵ Ex. S1 at 23 (Thurber Direct).

⁴⁶ SDCL § 11-2-61.1 (providing that a court “shall give deference to the decision of the approving authority in interpreting the authority’s ordinances”).

⁴⁷ Ex. A14 at 7 (Svedeman Rebuttal).

31. The Federal Aviation Administration (“FAA”) has issued a Determination of No Hazard for each of the Project’s proposed turbine sites, including Turbine 90 which is located near the Clear Lake Municipal Airport.⁴⁸ Deuel Harvest will comply with SDCL 50-9-1 and submit the Determinations of No Hazard to the South Dakota Aeronautics Commission “prior to the start of construction in lieu of the application and permit required by [SDCL 50-9].”⁴⁹ Accordingly, Deuel Harvest has demonstrated that the Project will comply with SDCL 50-9-1.

32. Intervenor Kilby argued that Deuel Harvest failed to demonstrate that it will comply with ARSD Chapter 20:10:22. However, ARSD Chapter 20:10:22 contains the application content requirements, which are not substantive decision-making criteria. Further, Staff provided testimony noting that the Application was “generally complete” at the time of filing and that “an applicant supplementing its original application with additional information as requested by Commission Staff is not unusual for siting dockets.”⁵⁰

33. The record demonstrates that construction of the Project will meet all of the requirements of Chapter 49-41B.

B. The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area.

1. Environment.

34. The evidence demonstrates that the Project does not pose a threat of serious injury to the environment in the Project Area and that Deuel Harvest has adopted numerous reasonable avoidance and minimization measures, as well as commitments, to further limit potential environmental impacts.⁵¹

35. Construction of the Project will not result in significant impacts on geological resources.⁵² The risk of seismic activity in the vicinity of the Project Area is “extremely low to negligible” according to data from the U.S. Geological Survey (“USGS”).⁵³

36. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to soil resources.⁵⁴ The majority of impacts will be temporary and related to construction activities.⁵⁵ Permanent impacts to soils associated with operation of the Project will be approximately 68 acres, which is less than 0.2 percent of the Project Area.⁵⁶ Deuel Harvest will implement various measures during construction and restoration to minimize impacts to the physical environment,

⁴⁸ Ex. S7 at 31 (Applicant’s Additional Data Request Responses to Staff) (Public).

⁴⁹ SDCL 50-9-1 and Ex. S7 at 31-32 (Applicant’s Additional Data Request Responses to Staff) (Public).

⁵⁰ Ex. S1 at 4 (Thurber Direct).

⁵¹ See, e.g., Ex. A1 at Ch. 10.0, §§ 11.1.2, 11.2.2, 12.1.2, 12.2.2, 13.1.2, 13.2.2, 13.3.4, 14.2, 17.2, 18.2 (Application).

⁵² See Ex. A1 at § 11.1.2 (Application).

⁵³ Ex. A1 at 11-4 (Application).

⁵⁴ See Ex. A1 at § 11.2.2 (Application).

⁵⁵ See Ex. A1 at 11-10 (Application).

⁵⁶ See Ex. A1 at 3-1, 8-1, 11-10, 15-3 (Application).

including segregating topsoil and subsoil, use of erosion and sediment control during and after construction, noxious weed control, and reseeded of disturbed areas.⁵⁷

37. The Project is not anticipated to have material impacts on existing air and water quality.⁵⁸

38. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to hydrology.⁵⁹ The record demonstrates that Deuel Harvest has minimized impacts to wetlands and water bodies.⁶⁰ The Project is not anticipated to have long-term impacts on groundwater resources.⁶¹ Although floodplains mapping has not been completed by FEMA for the Project Area, it is unlikely the Project would impact floodplains. Wind turbine and MET tower foundations, access roads, the Project Substation, and the O&M building will be located at higher elevations. Any potential impacts to floodplains would be temporary in nature, and existing contours and elevations would be restored upon Project completion.⁶² The nearest mapped floodplains to the Project Area are Zone A designations associated with the South Fork Yellow Bank River on the northern boundary of the Project Area and the West Fork of the Lac qui Parle River on the eastern Project Area boundary.⁶³

39. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to wetlands and streams. The Project would avoid significant impact to wetland areas and streams.⁶⁴ No turbines are located within delineated wetland basins, and only 12 of 119 access roads (10 percent) have the potential to cross wetlands.⁶⁵ Following the recommendation of SDGFP and USFWS, Deuel Harvest removed 12 proposed turbines sited in the northwest corner of the Project Area because of the concentration of wetlands in that area.⁶⁶

40. The record demonstrates that Deuel Harvest has minimized impacts to vegetation.⁶⁷ The proposed Project would result in approximately 57 acres of permanent disturbance to vegetation (predominantly cropland and grassland/pasture), which is less than 2 percent of the Project Area.⁶⁸

41. Deuel Harvest coordinated with GFP, USFWS, and The Nature Conservancy (“TNC”) to avoid and minimize impacts to potentially undisturbed grasslands.⁶⁹ The Project will avoid impacts to all of TNC’s native prairies and the USFWS’s grassland easements located in the Project Area.⁷⁰ The Project turbines and facilities were carefully sited to minimize

⁵⁷ See Ex. A1 at 11-1, 13-5 (Application).

⁵⁸ See Ex. A1 at §§ 17.2, 18.2 (Application).

⁵⁹ See Ex. A1 at §§ 12.1.2, 12.2.2 (Application); Ex. S2 at JT-9 (South Dakota Department of Environment and Natural Resource Response Letter) (Thurber Rebuttal).

⁶⁰ See Ex. A1 at § 13.2.2 (Application); Ex. A15 at 10 (Giampoli Rebuttal).

⁶¹ See Ex. A1 at § 12.1.2 (Application).

⁶² Ex. A1 at 12-8 (Application).

⁶³ Ex. A1 at 12-5 (Application).

⁶⁴ See Ex. A1 at § 13.2.2 (Application).

⁶⁵ Ex. A15 at 9, 11 (Giampoli Rebuttal).

⁶⁶ Ex. A15 at 4 (Giampoli Rebuttal); Evid. Hrg. Tr. at 16-17 (April 16, 2019) (Draft Transcript) (Giampoli).

⁶⁷ See Ex. A1 at § 13.1.2 (Application).

⁶⁸ Ex. A1 at 13-5 (Application).

⁶⁹ Ex. A15 at 9 (Giampoli Rebuttal); Ex. A7 at 4 (Svedeman Supplemental).

⁷⁰ Ex. A10 at 5 (Giampoli Supplemental); Ex. A15 at 9 (Giampoli Rebuttal); Ex. A7 at 4 (Svedeman Supplemental).

permanent impacts to potentially undisturbed grasslands to less than one-quarter of 1% of the 16,285 acres of potentially undisturbed grasslands mapped in the Project Area.⁷¹ Potentially undisturbed grassland impacts are estimated to be 0.09 percent.⁷² Permanent habitat loss due to construction of wind turbines would be minimal across the Project Area and localized.⁷³

42. Deuel Harvest will reseed temporarily disturbed uncultivated areas with weed-free seed mixes to blend in with existing vegetation.⁷⁴

43. Deuel Harvest has conducted numerous wildlife studies and surveys for the Project to assess existing use, identify potential impacts, and incorporate appropriate avoidance and minimization measures.⁷⁵ Deuel Harvest provided the testimony of Andrea Giampoli, Senior Manager of Environmental Compliance and Strategy at Invenergy, who has overseen the environmental due diligence on over 25 wind projects and who oversaw the environmental consultants that conducted the environmental due diligence on the Project.⁷⁶ Deuel Harvest has engaged in ongoing coordination with the USFWS and GFP to seek input on wildlife resources potentially occurring within the Project Area and to seek guidance on the appropriate studies to evaluate risk and inform development of impact avoidance and minimization measures for the Project.⁷⁷ Deuel Harvest followed the processes outlined in the USFWS Land-Based Wind Energy Guidelines (“WEG”), Eagle Conservation Plan Guidance (“ECPG”), and the South Dakota Siting Guidelines for developing, construction, and operation of wind energy projects.⁷⁸ In addition, Deuel Harvest has developed a Bird and Bat Conservation Strategy (“BBCS”) in accordance with the WEG, which includes strategies for mitigating risks to avian and bat species during construction and operation of the Project.⁷⁹

44. Construction of the Project may have impacts on wildlife species primarily as a result of habitat disturbance. However, following construction, all areas of temporary disturbance will be reclaimed with vegetation consistent with the surrounding vegetation types.⁸⁰ The Project was designed to avoid and minimize displacement of wildlife by minimizing the

⁷¹ Ex. A10 at 5 (Giampoli Supplemental); Ex. A15 at 9 (Giampoli Rebuttal); *see also* Evid. Hrg. Tr. at 328 (April 16, 2019) (Draft Transcript) (Kirschenmann).

⁷² Ex. A1 at 13-27 (Application).

⁷³ Ex. A1 at 13-23 (Application).

⁷⁴ Ex. A1 at 3-3, 13-5 (Application).

⁷⁵ *See* Ex. A1 at 2-2 – 2-3, § 13.3 (Application).

⁷⁶ Evid. Hrg. Tr. at 10, 55 (April 16, 2019) (Draft Transcript) (Giampoli).

⁷⁷ *See* Ex. A1 at 13-9 (Application).

⁷⁸ Ex. A1 at 13-9 (Application).

⁷⁹ *See* Ex. A15-1 (Updated BBCS). There were inadvertent inaccuracies in the Draft BBCS that were then incorporated into the Application. The distances of turbines from lakes and other specified resources on page 37 of the Draft BBCS were intended to be factual statements of the minimum distance to each resource, and not setbacks from each resource. However, the distances in the BBCS were inaccurate, and those inaccuracies were transferred to the Application (see Section 13.3.4.4). In its rebuttal testimony, Deuel Harvest supplemented Section 13.3.4.4 of its Application to include the correct distances (*see* Ex. A14 at 5-6 (Svedeman Rebuttal)) and submitted a revised BBCS that includes the same updates (*see* Ex. A15-1 (Updated BBCS) and Ex. A15 at 1-2 (Giampoli Rebuttal)).

⁸⁰ Ex. A1 at 13-5, 13-28 (Application).

Project's footprint in undisturbed areas.⁸¹ Permanent habitat loss due to construction of wind turbines and other facilities would be minimal across the Project Area and localized.⁸²

45. The record demonstrates that, while the Project may directly impact birds and bats, avian fatalities due to the Project are anticipated to be low and similar to the average mortality rates in the U.S. at wind facilities within similar environments.⁸³ To prevent potential bird strikes with electric lines, the electrical collection system will be buried underground.⁸⁴

46. The record demonstrates that the Project was designed to avoid and/or minimize impacts to bats. Based on available data, bat fatalities and the degree to which bat species would be affected by the Project would be within the average range of bat mortalities found throughout the U.S.⁸⁵ Project turbines will be feathered below cut-in, 3.0 meters per second (m/s; 6.7 mph) from sunset to sunrise April 1 – October 31 to reduce impacts to all bat species, including the northern long-eared bat ("NLEB"). This feathering will reduce the speed that blades will rotate when the turbines are not generating electricity in order to minimize the risk of bat-blade collisions.⁸⁶ Additionally, as recommended in the USFWS's Northern Long-Eared Bat Interim Guidance, all turbines will be sited more than 1,000 feet from the edge of connected patches of forested habitat to avoid potential impacts to bats, including the NLEB.⁸⁷ The Project has been sited in an area and designed in a manner to avoid and minimize impacts to birds and bats.⁸⁸

47. Deuel Harvest conducted two years of pre-construction avian surveys.⁸⁹ Those surveys indicate that avian impacts from the Project are anticipated to be low.⁹⁰ Further, Deuel Harvest has committed to a minimum of two years of independently-conducted post-construction avian and bat mortality monitoring.⁹¹

48. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to federal- and State-listed species.⁹² There is a potential for the following federally-listed species to occur within the Project Area, but the likelihood is low: whooping crane, NLEB, rufa red knot, Dakota skipper, Poweshiek skipperling, and Topeka shiner.⁹³ Five State-listed species may occur in Deuel County: whooping crane, osprey, banded killifish, northern redbelly dace, and northern river otter.⁹⁴ The whooping crane, osprey, banded killifish, northern redbelly dace, and northern river otter are not likely to occur within the Project Area due to limited suitable habitat and lack of historical records.⁹⁵ The only state-listed species observed was the osprey. No other

⁸¹ Ex. A1 at 9-2, 13-27 (Application).

⁸² Ex. A1 at 13-23 (Application).

⁸³ Ex. A1 at 13-26 (Application).

⁸⁴ Ex. A1 at 13-28 (Application).

⁸⁵ Ex. A15-1 at 35, 36-37 (Updated BBCS).

⁸⁶ Ex. A1 at 13-16, 13-29 (Application).

⁸⁷ Ex. A1 at 13-16 (Application).

⁸⁸ See Ex. A3 at 8 (Giampoli Direct); Ex. A1 at 13-16 (Application).

⁸⁹ Ex. A1 at § 2.5, 13.3.3 (Application).

⁹⁰ See Ex. Ex. A3 at 8 (Giampoli Direct); Ex. A1 at § 13.3.4 (Application).

⁹¹ Ex. A37 at ¶ 31 (Applicant's and Staff's Proposed Permit Conditions).

⁹² See Ex. A1 at §§ 13.3.2, 13.3.4 (Application); Ex. A3 at 6-7 (Giampoli Direct).

⁹³ See Ex. A3 at 6 (Giampoli Direct); Ex. A1 at § 13.3.2.1 (Application).

⁹⁴ See Ex. A3 at 6 (Giampoli Direct); Ex. A1 at §§ 13.3.2.2, 13.3.4 (Application).

⁹⁵ See Ex. A3 at 6 (Giampoli Direct); Ex. A1 at §§ 13.3.2, 13.3.4 (Application).

federal- or State-listed endangered or threatened species have been observed during surveys in the Project Area.⁹⁶

49. Over 839 avian survey hours, two osprey were observed on the eastern edge of the Project boundary in September 2017, 1.3 miles east of the nearest proposed turbine location. Osprey is considered rare in the county and were likely migrating through when they were observed. Given the low likelihood of osprey occurrences in the Project area, Deuel Harvest does not anticipate impacting this species.⁹⁷

50. While NLEB have the potential to migrate through the Project Area during the fall, Deuel Harvest sited turbines at least 1,000 feet away from suitable NLEB foraging habitat.⁹⁸

51. Deuel Harvest also conducted a field assessment for Dakota skipper and Poweshiek skipperling habitat, and sited Project facilities to avoid grasslands with the potential to support these species.⁹⁹

52. Impacts on federally-listed species due to Project construction and operations are anticipated to be minimal due to the low likelihood or frequency of species' presence in the Project Area and implementation of appropriate species-specific conservation measures.¹⁰⁰ Further, Project facilities have been sited to avoid federally-designated critical habitat, USFWS easements, protected lands, and sensitive resources that may provide habitat for protected species.¹⁰¹

53. Deuel Harvest has demonstrated that it will avoid impacts to whooping cranes.¹⁰² The Project Area is not located within the USFWS whooping crane migration corridor, which is located approximately 85 miles west of the Project Area; thus, whooping cranes are unlikely to occur in the Project Area.¹⁰³

54. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to eagles. Deuel Harvest has conducted two years of pre-construction avian use surveys to assess the use of the project area by bald eagles. Deuel Harvest also conducted two years of nest surveys to locate and assess the status of bald eagle nests in and around the Project Area.¹⁰⁴

55. Deuel Harvest submitted an information request regarding known bald eagle nest sites through the GFP Natural Heritage Program, as well as to the GFP Wildlife Division, and the USFWS South Dakota Ecological Services Field Office. Both agencies provided data to Deuel Harvest in August 2016 but did not include information about the eagle nest near Lake Alice at

⁹⁶ Ex. A3 at 6 (Giampoli Direct)

⁹⁷ Ex. A15 at 12 (Giampoli Rebuttal).

⁹⁸ Ex. A3 at 6-7 (Giampoli Direct); Ex. A1 at 13-25 (Application); Ex. A3 at 4 (Giampoli Direct).

⁹⁹ Ex. A3 at 7 (Giampoli Direct); Ex. A1 at 13-18 (Application).

¹⁰⁰ See Ex. A3 at 6-7 (Giampoli Direct); Ex. A1 at § 13.3.4 (Application).

¹⁰¹ Ex. A3 at 7 (Giampoli Direct).

¹⁰² See Ex. A1 at 13-18 (Application).

¹⁰³ Ex. A1 at 13-18 (Application).

¹⁰⁴ Ex. A15 at 15 (Giampoli Rebuttal).

that time.¹⁰⁵ The GFP local conservation officer became aware of the eagle nest near Lake Alice in 2016 and began monitoring it.¹⁰⁶

56. As Staff witness Mr. Kirschenmann testified, the information regarding the nest was not submitted to GFP and the Natural Heritage Database until after Deuel Harvest submitted its Natural Heritage Database request; accordingly, the information regarding that eagle nest was not in the Natural Heritage Database at the time of Deuel Harvest's request.¹⁰⁷ Deuel Harvest did not request an update following its August 2016 request because of ongoing consultation with GFP and USFWS and, as Mr. Kirschenmann testified, GFP did not provide an update notifying Deuel Harvest of the nest.¹⁰⁸ Deuel Harvest surveyed the Project Area and a ten-mile buffer by helicopter for eagle nests in 2016 and conducted a follow-up ground-based survey of previously-identified nests in the Project Area in 2017.¹⁰⁹ No eagle nests were detected near Lake Alice or in the Project Area during either survey.¹¹⁰ In February 2018, the USFWS informed Deuel Harvest that a landowner had brought to USFWS's attention that there may be an eagle nest north of Lake Alice.¹¹¹ Deuel Harvest reviewed the GFP Natural Heritage Program response, and the results of the two years of nest surveys and found that while there were medium sized raptor nests observed north of Lake Alice, none was considered large enough to be an eagle nest, so no further due diligence was conducted at that time.¹¹²

57. Following comments made at the January 24, 2019 public input hearing regarding a potential eagle nest near Lake Alice, Deuel Harvest contacted the USFWS and GFP. On February 5, 2019, GFP responded that it was aware of a nest and provided its coordinates.¹¹³ Deuel Harvest retained two qualified biologists to survey the area of the potential nest on February 5 and 6, 2019. The biologists confirmed the nest was an eagle nest. The biologists were not able to confirm if the nest is occupied or active, but recorded two mature bald eagles flying near the nest.¹¹⁴

58. Deuel Harvest also conducted an additional raptor nest survey in Spring 2019, and that survey did not identify any new eagle nests.¹¹⁵ Deuel Harvest is now coordinating with GFP and USFWS regarding eagle flight path mapping and eagle nest monitoring at the identified eagle nest north of Lake Alice.¹¹⁶ This involves having staff in the field for multiple days every three to four weeks during nesting season to map the flight paths of eagles in and around the nest and to understand the activity in the nest; this final study plan has been shared with GFP and

¹⁰⁵ Ex. A10 at 2 (Giampoli Supplemental).

¹⁰⁶ Evid. Hrg. Tr. at 328-29 (April 16, 2019) (Draft Transcript) (Kirschenmann).

¹⁰⁷ Evid. Hrg. Tr. at 333-34 (April 16, 2019) (Draft Transcript) (Kirschenmann).

¹⁰⁸ Evid. Hrg. Tr. at 333-34 (April 16, 2019) (Draft Transcript) (Kirschenmann).

¹⁰⁹ Ex. A10 at 2 (Giampoli Supplemental).

¹¹⁰ Ex. A10 at 2 (Giampoli Supplemental).

¹¹¹ Ex. A10 at 2 (Giampoli Supplemental).

¹¹² Ex. A10 at 2 (Giampoli Supplemental).

¹¹³ Ex. A10 at 2 (Giampoli Supplemental).

¹¹⁴ Ex. A10 at 3 (Giampoli Supplemental); *see also* Ex. A10-1 (Burns & McDonnell Memorandum, Eagle Nest Monitoring near Lake Alice, South Dakota for the Deuel County North Wind Farm, Deuel County, South Dakota (February 11, 2019)).

¹¹⁵ Evid. Hrg. Tr. at 17-18 (April 16, 2019) (Draft Transcript) (Giampoli).

¹¹⁶ Ex. A15 at 2 (Giampoli Rebuttal).

USFWS.¹¹⁷ In accordance with the recommendations under the South Dakota Bald Eagle Management Plan, Deuel Harvest has committed to relocating two turbines (Turbine Nos. 40 and 41) to 800 meters (0.5 mile) from the Lake Alice eagle nest to limit disturbance to eagles.¹¹⁸

59. Further, according to the USFWS, no eagle fatalities have been reported at a wind energy facility in South Dakota.¹¹⁹ Additionally, bald eagle populations are increasing by five percent annually.¹²⁰

60. In addition, Deuel Harvest has agreed to a number of avian-related impact minimization and avoidance measures, including: conducting post-construction avian mortality monitoring for two years; and implementing the BBCS developed in accordance with the USFWS WEG to minimize impacts to avian and bat species during construction and operation of the Project.¹²¹

61. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to aquatic ecosystems.¹²² The federally- and State-listed aquatic species with potential to occur in or near the Project are not anticipated to be affected by the Project.¹²³

62. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to land use.¹²⁴ The Project will not displace existing residences or businesses.¹²⁵ Areas disturbed due to construction that would not host Project facilities would be re-vegetated with vegetation types matching the surrounding agricultural landscape. Agricultural uses may continue within the Project Area during construction and operation.¹²⁶

63. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to recreation.¹²⁷ No Project facilities would be placed on USFWS Waterfowl Production Areas, GFP Game Production Areas, or GFP Walk-In Areas.¹²⁸ All turbines will be sited away from the “Avoidance Areas” identified by GFP and from all USFWS Waterfowl Protection Areas and GFP Game Production Areas; the nearest turbine will be 442 meters (0.27 miles), and 245 meters (0.15 miles) from these areas, respectively.¹²⁹

64. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to conservation easements and publicly-managed lands.¹³⁰ Deuel Harvest coordinated with the

¹¹⁷ Evid. Hrg. Tr. at 18 (April 16, 2019) (Draft Transcript) (Giampoli).

¹¹⁸ Ex. A15 at 15 (Giampoli Rebuttal); Ex. A14 at 5 (Svedeman Rebuttal).

¹¹⁹ Ex. A15 at 15 (Giampoli Rebuttal).

¹²⁰ Evid. Hrg. Tr. at 110 (April 16, 2019) (Draft Transcript) (Giampoli).

¹²¹ See, e.g., Ex. A37 at ¶ 31 (Applicant’s and Staff’s Proposed Permit Conditions); Ex. A5-1 (Updated BBCS); Ex. A15 at 2, 8, 15 (Giampoli Rebuttal); Ex. A3 at 8 (Giampoli Direct).

¹²² See Ex. A1 at § 14.2 (Application).

¹²³ See Ex. A1 at 14-3 (Application).

¹²⁴ See Ex. A1 at §§ 15.1.2, 20.2.2 (Application).

¹²⁵ Ex. A1 at 15-3 (Application).

¹²⁶ See Ex. A1 at 15-3, § 20.2.2 (Application).

¹²⁷ See Ex. A1 at §§ 15.2.2, 15.4.2, 20.3.2 (Application).

¹²⁸ Ex. A1 at 15-5 (Application).

¹²⁹ Ex. A14 at 6 (Svedeman Rebuttal).

¹³⁰ See Ex. A1 at 3-3, §§ 13.1.1.3, 15.2 (Application); Ex. A10 at 5 (Giampoli Supplemental); Ex. A15 at 9 (Giampoli Rebuttal).

USFWS to identify the exact boundaries of the USFWS wetland, grassland, and conservation easements within the Project Area.¹³¹ The Project has been designed such that no Project facilities would be placed on USFWS wetland or grassland easements, and thus, no direct impacts to these easement areas would occur.¹³² As noted above, the Project will also avoid direct impacts to Game Production Areas and Waterfowl Production Areas.¹³³

65. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to visual resources.¹³⁴ The nearest scenic resources to the Project Area are the Mitchell State Public Shooting Area (“SPSA”), located on the eastern side of Lake Alice near the middle of the Project Area; the Lone Tree Lake SPSA, on the eastern side of Lone Tree Lake also near the middle of the Project Area; the Altamont SPSA, Nelson State WMA, Rome State WMA, Sharp SPSA, Rush Lake SPSA, Mud Lake SPSA, Ulen Park, Briggs Lake SPSA, and the Lake Francis SPSA.¹³⁵ In accordance with Federal Aviation Administration (“FAA”) regulations, the turbine towers would be painted off-white to reduce potential glare and minimize visual impact.¹³⁶

66. Additionally, Deuel Harvest will install and use ADLS if approved by the FAA for use for the Project, thereby reducing visual impacts.¹³⁷

67. Deuel Harvest has demonstrated that it will minimize and/or avoid impacts to cultural resources.¹³⁸ Deuel Harvest conducted multiple cultural resource surveys to identify cultural resources within the Project Area and is continuing to conduct additional cultural resource surveys.¹³⁹ Deuel Harvest conducted a cultural resource Level I records review for the Project Area in 2018, which identified previously recorded archaeological and historic resources located within or near the Project Area.¹⁴⁰ Deuel Harvest also conducted a Historic Architectural Resources Reconnaissance Survey.¹⁴¹

68. Deuel Harvest’s contractor implemented a survey methodology that identified High Probability Areas (“HPAs”) based on the results of previous investigations, and local and regional proximity to water sources, with consideration of water resource types, topography and land usage.¹⁴² Based on that analysis, Deuel Harvest’s contractor identified an area comprising

¹³¹ Ex. A1 at § 15.2.2 (Application).

¹³² Ex. A1 at 15-5 (Application).

¹³³ Ex. A1 at 15-5 (Application).

¹³⁴ See Ex. A1 at § 15.4.2 (Application).

¹³⁵ Ex. A1 at 15-13 (Application).

¹³⁶ Ex. A1 at 8-5 (Application).

¹³⁷ Ex. A37 at ¶ 35 (Applicant’s and Staff’s Proposed Permit Conditions); Ex. A1 at 3-2 (Application); Ex. A14 at 4 (Svedeman Rebuttal).

¹³⁸ See Ex. A1 at § 20.5.6 (Application); Ex. A1, Appendix E (Level III Intensive Cultural Resources Survey) (Confidential); Ex. A7 at 4-5 (Svedeman Supplemental); Ex. A7-1 (Deuel Harvest Letter to SHPO, Dated February 5, 2019 (Confidential)); Ex. A7-2 (SHPO Email Dated February 5, 2019 and Deuel Harvest Response Dated February 7, 2019); Ex. A14 at 10-12 (Svedeman Rebuttal); Ex. A14-4 (Deuel Harvest Cultural Resources Study Plan, March 22, 2019); Ex. A14-5 (SHPO Concurrence Letter, March 26, 2019).

¹³⁹ See, e.g., Ex. A1, Appendix E (Level III Intensive Cultural Resources Survey) (Confidential); Ex. A14 at 10-12 (Svedeman Rebuttal);

¹⁴⁰ Ex. A1 at 2-3, 3-2 (Application).

¹⁴¹ See Ex. A1 at 20-12, 20-19 – 20-20 (Application); Ex. A1, Appendix T (Historical/Architectural Survey) (Confidential).

¹⁴² Ex. A14 at 11 (Svedeman Rebuttal).

15 percent of the Project Component Footprint that was then surveyed by professional archeologists. Through that survey effort, no intact prehistoric archeological sites were identified.¹⁴³

69. After further consultation with the South Dakota State Historical Society, State Historic Preservation Office (“SHPO”), Deuel Harvest committed to conducting additional Level III surveys of the remaining 85% of the Project Component Footprint, including buffer areas, to provide additional assurance that archaeological resources will not be impacted.¹⁴⁴ SHPO concurred with Deuel Harvest’s planned survey approach, methodology and timeframe.¹⁴⁵ These surveys are currently in progress¹⁴⁶ and a report is scheduled to be submitted to Deuel Harvest by July 10, 2019.¹⁴⁷

70. Sites or historic architectural resources determined to be eligible for inclusion on the National Register of Historic Places (“NRHP”) are avoided by Project facilities.¹⁴⁸ If avoidance is not practicable, Deuel Harvest will work with SHPO to develop appropriate minimization or mitigation measures.¹⁴⁹ Further, Deuel Harvest has agreed to develop an unanticipated discovery plan for cultural resources in consultation with SHPO.¹⁵⁰

71. As Staff witness Ms. Paige Olson testified, Applicant has addressed SHPO’s concerns by committing to develop an unanticipated discovery plan for cultural resources, avoid known cultural resource site, and to follow SHPO’s recommendation to survey all areas that would be directly impacted by construction of the Project.¹⁵¹

72. Deuel Harvest notified Tribes in the vicinity of the Project Area of the Project in November 2018, provided details of the Project and offered the opportunity to review the Project’s cultural resource survey results. No Tribe notified Deuel Harvest that it wishes to have the opportunity to review those results.¹⁵²

73. Staff and Deuel Harvest have agreed upon Conditions 11 through 13 regarding cultural resources.¹⁵³

¹⁴³ Ex. A14 at 11 (Svedeman Rebuttal).

¹⁴⁴ Ex. A14 at 10-11 (Svedeman Rebuttal).

¹⁴⁵ Ex. A14 at 10 (Svedeman Rebuttal); Ex. A14-5 (SHPO Concurrence Letter, March 26, 2019); *see also* Evid. Hrg. Tr. at 129-30 (April 16, 2019) (Draft Transcript) (Olson).

¹⁴⁶ Evid. Hrg. Tr. at 24-25 (April 15, 2019) (Draft Transcript) (Svedeman).

¹⁴⁷ Ex. A14 at 10 (Svedeman Rebuttal).

¹⁴⁸ Ex. A1 at 3-2, 20-20 (Application); *see also* Ex. A14 at 12 (Svedeman Rebuttal) and Ex. S5 at 9 (Olson Direct); Ex. A37 at ¶ 11 (Applicant’s and Staff’s Proposed Permit Conditions).

¹⁴⁹ Ex. A14 at 12 (Svedeman Rebuttal) and Ex. S5 at 9 (Olson Direct); Ex. A37 at ¶¶ 11, 13 (Applicant’s and Staff’s Proposed Permit Conditions).

¹⁵⁰ Ex. A14 at 12 (Svedeman Rebuttal) and Ex. S5 at 9 (Olson Direct); Ex. A37 at ¶ 12 (Applicant’s and Staff’s Proposed Permit Conditions).

¹⁵¹ Evid. Hrg. Tr. at 129-30 (April 16, 2019) (Draft Transcript) (Olson).

¹⁵² Ex. A1 at 20-20 (Application) and Ex. A14 at 12 (Svedeman Rebuttal).

¹⁵³ *See* Ex. A37 at ¶ 11-13 (Applicant’s and Staff’s Proposed Permit Conditions).

2. Social and Economic.

74. Deuel Harvest began developing the Project in mid-2015 with initial landowner outreach, establishment of a local office on Main Street in Clear Lake, South Dakota, and the construction of three MET towers to verify and quantify the strong wind resource in the area.¹⁵⁴ Deuel Harvest has undertaken extensive development activities, consisting of landowner outreach and easement acquisition, detailed studies of resources in the Project Area, coordination with resource agencies, and design and refinement of the Project configuration. Deuel Harvest's outreach efforts have included: meeting with individual landowners and landowner groups, regulatory agencies, local government units, and the general public to discuss the Project; and gathering comments to address in the Project's planning, design, permitting, construction, and operation phases.¹⁵⁵

75. Deuel Harvest has obtained all of the land rights required to construct the Project. Private land and public road right-of-way would be used for all Project facilities.¹⁵⁶

76. The identification of the final Project site was primarily driven by: superior wind resources; proximity and direct access to the Big Stone to Brookings 345-kV transmission line to minimize interconnection infrastructure and need for long distance transmission lines; the ability to locate the Project Area within a single county; the Project's ability to avoid or minimize potential adverse environmental impacts; compatibility with existing agricultural use; and strong support from landowners in the Project Area, as well as the surrounding community.¹⁵⁷

77. Deuel Harvest also considered input from agencies and the public in siting the Project and in identifying potential turbine locations. Some of the adjustments made during Project siting and design, in response to comments, included: avoidance of impacts to State and federal lands within or near the Project Area, and avoidance or minimization of impacts to undisturbed grasslands, wetlands, and other habitats within or near the Project Area.¹⁵⁸ The proposed configuration of Project facilities also reflects an optimal configuration to best capture wind energy within the Project Area, while avoiding impacts to residences, known cultural resources, wetlands, grasslands, and sensitive species and their habitats.

78. A previous site configuration, which included 161 turbine locations, was submitted and permitted at the County level in December 2017. Deuel Harvest's decision to utilize a combination of 2.3 and 2.82 MW turbines reduced the number of turbine locations in the layout and reduced the total number of and combined footprint of turbines.¹⁵⁹

79. In prior contested siting dockets, the Commission has considered the following socioeconomic issues in evaluating whether a project would pose a threat of serious injury to the social and economic condition: temporary and permanent jobs; tax revenue; and impacts on commercial, agricultural, and industrial sectors, housing, land values, labor market, health

¹⁵⁴ Ex. A1 at 2-1 (Application).

¹⁵⁵ Ex. A1 at 2-1 (Application).

¹⁵⁶ Ex. A1 at 9-3 (Application).

¹⁵⁷ Ex. A1 at 9-1 (Application).

¹⁵⁸ Ex. A1 at 27-5 (Application).

¹⁵⁹ Ex. A1 at 9-2 (Application).

facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities, and other community and government facilities.¹⁶⁰

80. The record demonstrates that the Project will not pose a threat of serious injury to the social and economic condition.¹⁶¹

81. Deuel Harvest has demonstrated that the Project will not adversely impact property values.¹⁶² Mr. MaRous, a South Dakota State Certified General Appraiser and a certified Member Appraisal Institute appraiser with extensive experience evaluating the impact of wind turbines on property values, conducted a Market Analysis to analyze the potential impact of the Project on the value of the surrounding properties and found no market data indicating property values will be adversely impacted due to proximity to the Project.¹⁶³ Mr. MaRous further noted that the additional income from participating in the Project may actually increase the value of participating agricultural land.¹⁶⁴ This conclusion is also consistent with the Commission's recent findings regarding property values in the Prevailing Wind Park, Dakota Range I and II, and Crocker wind farm proceedings.¹⁶⁵

82. There were allegations that Mr. Holborn lost money on the sale of his home in February 2019.¹⁶⁶ He provided no appraisal or other evidence to support this claim. The facts in the record indicate that any alleged loss was due to extra investments Mr. Holborn made to the

¹⁶⁰ See, e.g., *In the Matter of the Application of Dakota Access, LLC for an Energy Facility Permit to Construct the Dakota Access Pipeline*, Docket HP14-002, Final Decision and Order; Notice of Entry (Dec. 14, 2015) at ¶¶ 100-101; *In the Matter of the Application by TransCanada Keystone Pipeline, LP for a Permit Under the South Dakota Energy Conversion and Transmission Facilities Act to Construct the Keystone XL Project*, Docket HP09-001, Amended Final Decision and Order; Notice of Entry (June 29, 2010) at ¶¶ 107-110 (discussing socioeconomic effects, including tax revenue, jobs, and impacts on agricultural, commercial, and industrial sectors and public facilities); *In the Matter of the Application of Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at ¶¶ 50-57; *In the Matter of the Application of Montana-Dakota Utilities Co. and Otter Tail Power Company for a Permit to Construct the Big Stone South to Ellendale 345 kV Transmission Line*, Docket EL13-028, Final Decision and Order; Notice of Entry (Aug. 22, 2014) at ¶¶ 29-31 (discussing impacts to agriculture, property values, and local roads under this criterion).

¹⁶¹ See, e.g., Ex. A1 at §§ 20.1.2, 20.2.2 (Application).

¹⁶² See Ex. Ex. A1 at § 20.1.2.3 (Application); Ex. A1, Appendix W (Market Impact Analysis); Ex. A5 at 6, 7-9 (MaRous Direct).

¹⁶³ See Ex. A1, Appendix W (Market Impact Analysis) and Ex. A5 at 8-9 (MaRous Direct).

¹⁶⁴ Ex. A5 at 6 (MaRous Direct).

¹⁶⁵ See *In the Matter of the Application by Prevailing Wind Park, LLC for a Permit of a Wind Energy Facility in Bon Homme County, Charles Mix County and Hutchinson County, South Dakota, for the Prevailing Wind Park Project*, Docket EL18-026, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (Nov. 28, 2018) at ¶ 52; *In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at ¶¶ 53-54; *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) at ¶¶ 58-60; see also Ex. A5 at 6-7 (MaRous Direct); Ex. A5-1 (Surrebuttal Testimony of David Lawrence in Dakota Range Docket).

¹⁶⁶ Evid. Hrg. Tr. at 339 (April 17, 2019) (Draft Transcript) (Holborn).

property. There is no evidence that the proposed Project affected the value of his home, which is located three quarters of a mile from the nearest proposed turbine location.¹⁶⁷ Mr. Holborn testified regarding the substantial upgrades he made to the house to customize it for his family; the upgrades included geothermal heat, extra insulation, a driveway, and a 50-year metal roof. He acknowledged that he did not expect to recover his full investment when he sold the property. Appraiser MaRous confirmed that property owners make business decisions about what to invest in a house and that some of that investment cannot be recaptured on resale.¹⁶⁸

83. There is no basis in the record to require a property value guarantee. There is no record evidence that property values will be adversely affected.¹⁶⁹

84. The record demonstrates that the Project will not adversely impact hunting or gaming operations in the area. Intervenors Heath and Will Stone testified regarding their concerns about the Project's impact on their pheasant hunting operation (the "Stone Hunting Operation"). The hunting operation uses approximately 6,000 farm raised Ring-necked pheasants annually. Approximately 25-50 wild pheasants are taken on the property annually.¹⁷⁰ There is no evidence in the record that the Project will adversely impact the Stone Hunting Operation, or hunting in general. The Project does not prohibit or otherwise restrict hunting.¹⁷¹ To the contrary, there was evidence that wind turbines do not adversely affect hunting lodge operations—the Oak Tree Lodge is a hunting operation in Clark that has approximately 10 wind turbines installed on its property.¹⁷²

85. The study cited by Heath Stone in his testimony does not support his claim that the Project will affect pheasant distribution in the area and around the Stone property. Rather, the study referenced by Mr. Stone found that there was "no biologically significant avoidance of wind turbines by male Ring-necked pheasants."¹⁷³

¹⁶⁷ Evid. Hrg. Tr. at 343 (April 17, 2019) (Draft Transcript) (Holborn).

¹⁶⁸ Evid. Hrg. Tr. at 149 (April 17, 2019) (Draft Transcript) (MaRous).

¹⁶⁹ See Ex. A20 at 1-2 (MaRous Rebuttal); see also *In the Matter of the Application by Prevailing Wind Park, LLC for a Permit of a Wind Energy Facility in Bon Homme County, Charles Mix County and Hutchinson County, South Dakota, for the Prevailing Wind Park Project*, Docket EL18-026, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (Nov. 28, 2018) at ¶ 53; *In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at ¶ 55; *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) at ¶ 61.

¹⁷⁰ Evid. Hrg. Tr. at 211 (April 18, 2019) (Draft Transcript) (H. Stone).

¹⁷¹ Ex. A14 at 16-17 (Svedeman Rebuttal).

¹⁷² Evid. Hrg. Tr. at 128 (April 17, 2019) (Draft Transcript) (MaRous).

¹⁷³ Ex. HS2 at 33 (Dupuie, Ring-necked Pheasant responses to wind energy in Iowa). The Dupuie paper also states that while the results "suggest that wind energy infrastructure impacts pheasant abundance, because of the relatively small scale of these effects, we argue they are not biologically significant. Large changes in turbine density and distance equate to changes in only a fraction of a bird." Ex. HS2 at 23 (Dupuie, Ring-necked Pheasant responses to wind energy in Iowa).

86. The record demonstrates that the Project will, on the whole, have positive impacts on the community.¹⁷⁴ Construction and operation of the Project will result in substantial benefits to South Dakota and local economies.¹⁷⁵ The Project will create temporary job opportunities during construction, and permanent operations and maintenance job opportunities. During construction, the Project is expected to create approximately 400 temporary construction jobs. During operations, the Project is anticipated to employ approximately 15 full-time, local personnel at the Project's O&M facility.¹⁷⁶ Additionally, local businesses would also likely benefit from construction-related workers and construction-related expenditures for the Project.¹⁷⁷ The Project will make lease payments to participating landowners and will provide long-term benefits to the state and local tax base.¹⁷⁸ Over the estimated 30-year life of the Project, the Project is expected to directly generate more than \$4.5 million in annual local revenue, including taxes, lease payments, and local staff salaries.¹⁷⁹ Further, in addition to annual generation tax payments made to the school, Invenergy will fund a \$30,000 annual scholarship provided to Deuel Schools.¹⁸⁰

87. While the intervenors voiced their concerns, the Commission also heard the testimony of landowners who do support the Project and they explained their reasons for participating in the Project. Participating landowners Mr. Doyle Thompson and Mr. Cody Kenyon testified to their good working relationships with Deuel Harvest and how they believe the Project will benefit the community.¹⁸¹ Mr. Thompson and Mr. Kenyon explained their reasons for supporting the Project, including that the Project will generate much-needed revenue for the county, townships, and local schools, provide an additional stable source of income for landowners, and create opportunities for future generations to be able to stay in the community and buy land and actually make a living off the land.¹⁸²

88. Some of the comments expressed by opponents of the Project relate to fears regarding environmental impacts, potential health impacts, noise, and shadow flicker; however, as discussed in the section above, these fears are unfounded and the Project has been designed to minimize environmental impacts and as discussed in the section below, allegations of potential health effects are not supported by record evidence.

89. The record demonstrates that the Project is not anticipated to adversely impact communications systems.¹⁸³ Deuel Harvest completed a study on the effects of the Project upon

¹⁷⁴ See, e.g., Ex. A1 at § 20.1.2, 6-1, 20-2 – 20-3 (Application); Ex. A22 at 3 (Kenyon Rebuttal); Ex. A23 at 3 (Thompson Rebuttal).

¹⁷⁵ See, e.g., Ex. A1 at 6-1, § 20.1.2 (Application).

¹⁷⁶ Ex. A1 at 6-1, 20-2 – 20-3 (Application).

¹⁷⁷ Ex. A1 at 20-2 – 20-3 (Application).

¹⁷⁸ Ex. A1 at 20-3 (Application).

¹⁷⁹ Ex. A1 at 6-1 (Application); see also Ex. A1 at 20-3 (Application); Ex. A2 at 23 (Svedeman Direct).

¹⁸⁰ Ex. A1 at 20-3 (Application).

¹⁸¹ See Ex. A22 at 2-3 (Kenyon Rebuttal); Ex. A23 at 2-3 (Thompson Rebuttal); see also Evid. Hrg. Tr. at 66-67, 70, 78 (April 17, 2019) (Draft Transcript) (Kenyon); Evid. Hrg. Tr. at 3-4, 10-11, 13, 18 (April 17, 2019) (Draft Transcript) (Thompson). None of the intervenors who participated in the evidentiary hearing live within the Project Area. See Ex. A26 (Updated Landowner Ownership Map).

¹⁸² Ex. A22 at 2 (Kenyon Rebuttal); Ex. A23 at 2-3 (Thompson Rebuttal); Evid. Hrg. Tr. at 66-67, 70, 78 (April 17, 2019) (Draft Transcript) (Kenyon); Evid. Hrg. Tr. at 3-4, 10-11, 13, 18 (April 17, 2019) (Draft Transcript) (Thompson).

¹⁸³ See Ex. A1 at § 15.6 (Application).

Federal Communications Commission (“FCC”)-licensed radio frequency facilities, including analyses of microwave paths, airports, radar stations, and military airspace.¹⁸⁴ Deuel Harvest is also undergoing the Interdepartmental Radio Advisory Committee (“IRAC”) review process developed by the National Telecommunication Information Agency (“NTIA”).¹⁸⁵ In addition, Deuel Harvest and Staff have agreed upon Condition 24 regarding interference with communication systems.¹⁸⁶

90. The record demonstrates that Deuel Harvest has avoided and/or minimized impacts to transportation.¹⁸⁷ Deuel Harvest will work with local units of government to obtain the necessary road crossing, approach, and utility permits for the Project.¹⁸⁸ Deuel Harvest will coordinate with applicable local road authorities to establish road use agreements, as needed, to minimize and mitigate Project impacts to roads utilized during construction.¹⁸⁹ The Project will participate in the South Dakota One-Call program.¹⁹⁰

91. No public airports occur within the Project Area.¹⁹¹ The closest airport is Clear Lake Municipal Airport, which is a public airport located in Clear Lake, South Dakota, approximately 2.5 miles south of the Project Area.¹⁹² Deuel Harvest completed an analysis of the potential effects on aviation for wind turbines built to a height of 499 feet (“ASI Report”).¹⁹³ Project Facilities are sited to meet the requirements of the ASI report, and no impacts to public airports are anticipated.¹⁹⁴

92. The FAA has issued a Determination of No Hazard for each of the Project’s proposed turbine sites.¹⁹⁵

93. Deuel Harvest also conducted Obstruction Evaluation and Airspace Analyses (“OE Study”) of the airspace and the associated height constraints in the vicinity of the Project, which included assessing impacts to public-use, military and private use airports with at least one FAA approved instrument approach procedure.¹⁹⁶ The OE Study assessed potential impacts to instrument approach and departure procedures, visual flight rules (“VFR”) traffic patterns, VFR routes, en-route airways, minimum vectoring altitudes, minimum instrument flight rules (“IFR”) altitudes, terminal and en-route NAVAIDS, and military airspace and training routes. The analysis concluded that the Project turbines, as proposed, would not have an adverse aeronautical effect.¹⁹⁷

¹⁸⁴ See Ex. A1 at § 15.6 (Application).

¹⁸⁵ Ex. A1 at 15-17 – 15-18 (Application) and Ex. S1 at JT-1 page 9 of 41 (Thurber Direct).

¹⁸⁶ See Ex. A37 at ¶ 24 (Applicant’s and Staff’s Proposed Permit Conditions).

¹⁸⁷ See Ex. A1 at § 20.4.2 (Application).

¹⁸⁸ Ex. A1 at 16-1 (Application).

¹⁸⁹ Ex. A1 at 16-1, 20-8 (Application).

¹⁹⁰ Ex. A1 at 24-2 (Application).

¹⁹¹ Ex. A1 at 20-9 (Application).

¹⁹² Ex. A1 at 20-9 (Application).

¹⁹³ Ex. A1 at 20-9 (Application); Ex. A1, Appendix S (Aviation Report).

¹⁹⁴ See Ex. A1 at 20-9 (Application); Ex. A1, Appendix S (Aviation Report).

¹⁹⁵ Ex. S7 at 31 (Applicant’s Additional Data Request Responses to Staff) (Public).

¹⁹⁶ Ex. A21 at 7 (Doyle Rebuttal).

¹⁹⁷ Ex. A21 at 7-8 (Doyle Rebuttal).

94. Deuel Harvest will comply with SDCL 50-9-1 and submit the Determinations of No Hazard to the South Dakota Aeronautics Commission “prior to the start of construction in lieu of the application and permit required by [SDCL 50-9].”¹⁹⁸

C. The facility will not substantially impair the health, safety or welfare of the inhabitants.

95. Staff and Deuel Harvest previously agreed upon Condition 26 regarding noise,¹⁹⁹ and, in response to Commission questions at the evidentiary hearing, Deuel Harvest and Commission Staff agreed to a revised condition that describes the post-construction protocols that would be implemented for the Project, if post-construction monitoring were required.²⁰⁰

96. Section 1215.03(13)(a) of the Deuel County Zoning Ordinance provides that the noise level from wind energy systems “shall not exceed 45 dBA average A-Weighted Sound pressure at the perimeter of existing residences, for non-participating residences.”²⁰¹ Deuel Harvest voluntarily committed to limit noise to 50 dBA at participating residences.²⁰²

97. Deuel Harvest retained an independent expert to independently model the predicted noise levels for the Project.²⁰³ Noise levels are predicted to be less than 45 A-weighted decibels (“dBA”) at all non-participating residences, and less than 50 dBA at all participating residences.²⁰⁴ Accordingly, the Project will comply with the requirements of Deuel County and Deuel Harvest’s voluntary commitment.

98. The Project’s acoustic modeling utilized conservative assumptions and was conducted in accordance with the international standard (ISO 9613-2). The modeling assumes all turbines were operating and producing maximum acoustic output, these emissions propagate out fully in all directions, and that atmospheric conditions will be relatively ideal for the propagation of sound.²⁰⁵ While the modeling did not include the turbine manufacturers’ uncertainty factor, the modeling did apply a conservative ground factor of 0.0, which represents completely reflective ground material such as pavement or flat water, and results in a higher level of sound reaching a receptor.²⁰⁶ Actual ground conditions could at times be 0.0 when the ground is completely frozen, but would generally be closer to 0.5.²⁰⁷ The model takes into account source sound power levels, terrain and ground type, ground absorption and reflection, and atmospheric propagation conditions.²⁰⁸

¹⁹⁸ SDCL 50-9-1 and Ex. S7 at 31-32 (Applicant’s Additional Data Request Responses to Staff) (Public).

¹⁹⁹ Ex. A37 at ¶ 26 (Applicant’s and Staff’s Proposed Permit Conditions).

²⁰⁰ Applicant’s Post-Hearing Brief, Attachment A at ¶ 26 (Applicant’s and Staff’s Updated Proposed Permit Conditions) [hereinafter Applicant’s and Staff’s Updated Proposed Permit Conditions].

²⁰¹ Ex. A1, Appendix C (WES Ordinance, SEP, and Findings); Ex. A1 at 15-7 (Application).

²⁰² Ex. A7 at 2 (Svedeman Supplemental).

²⁰³ Ex. A4 at 2 (Hankard Direct).

²⁰⁴ Ex. A17 at 2 (Hankard Rebuttal).

²⁰⁵ See Ex. A17-1 at 5, 6 (Updated Noise Analysis).

²⁰⁶ Mr. Hessler agreed the assumption is more conservative. Evid. Hrg. Tr. at 43 (April 18, 2019) (Draft Transcript) (Hessler).

²⁰⁷ Ex. A4 at 6-7 (Hankard Direct); Ex. A17-1 at 6 (Updated Noise Analysis).

²⁰⁸ See Ex. A17-1 at 4, 5 (Updated Noise Analysis).

99. Deuel Harvest's acoustical expert Mr. Hankard has verified the accuracy and conservativeness of the modeling method employed for the Project through field measurements at other operating wind projects; thus, the methodology for modeling noise levels has been tested and confirmed in the field.²⁰⁹ Mr. Hankard's post-construction measurements have demonstrated that his conservative pre-construction modeling methods typically exceed actual operational noise levels of proposed projects.²¹⁰

100. Based on the conservative nature of the sound modeling for the Project, actual noise levels for the Project are expected to be lower than the modeled levels at all times.²¹¹

101. The record demonstrates that a 45 dBA Leq limit at non-participating residences is an appropriate and reasonable noise limit. Mr. Hankard, who was retained by Deuel Harvest to independently model the predicted noise levels for the Project, testified that these limits are reasonable and that, based on his modeling, the Project will meet these limits.²¹² Mr. Hankard testified that Deuel County's 45 dBA Leq limit is a reasonable regulatory standard for non-participating landowners based on what he has seen used in other counties and states across the United States.²¹³ As Mr. Hankard testified, Deuel County's 45 dBA limit is on the low end of the range of United States wind farm sound limits that he is familiar with based on working on projects in 14 states and dozens of counties; further, it is often difficult to discern wind turbine noise at 45 dBA in the presence of noise from the wind blowing through vegetation (trees, grass, crops), the noise level of which ranges from 35 to 55 dBA.²¹⁴ Staff witness Mr. Hessler agreed that 45 dBA Leq at non-participating residences and 50 dBA at participating residences are reasonable limits the Commission should apply to the Project.²¹⁵

102. Further, Mr. Hessler and Mr. Hankard agreed that Intervenor Homan's proposal of 35 dBA at non-participating residences is not a reasonable, or achievable, condition for the Project.²¹⁶

103. Thus, a 45 dBA limit at non-participants' residences is consistent with prior dockets, consistent with Deuel County's requirements, and fully supported in the record.

104. Mr. Hessler and Mr. Hankard agreed that L10 should not be used as the sound level metric for the Project.²¹⁷ First, the L10 (the level exceeded 10% of the time) is typically applied to sources of transient noise, such as highways, where there is a significant fluctuation in the noise level (e.g., very loud when a truck goes by, and almost silent when no traffic is present).²¹⁸ Wind turbines, when operating near or at full power (which is the condition of

²⁰⁹ See Ex. A4 at 7-8 (Hankard Direct); Ex. A17-1 at 7, 12 (Updated Noise Analysis).

²¹⁰ See Ex. A4 at 7-8 (Hankard Direct); Ex. A17-1 at 7, 12 (Updated Noise Analysis).

²¹¹ See Ex. A4 at 8 (Hankard Direct); Ex. A17-1 at 7, 12 (Updated Noise Analysis); *see also* Evid. Hrg. Tr. at 261 (April 16, 2019) (Draft Transcript) (Hankard).

²¹² Ex. A17 at 2, 4 (Hankard Rebuttal); Ex. A17-1 at 12 (Updated Noise Analysis).

²¹³ Ex. A9 at 3 (Hankard Supplemental).

²¹⁴ Ex. A24 at 8 (Hankard Surrebuttal); *see also* Evid. Hrg. Tr. at 264-65 (April 16, 2019) (Draft Transcript) (Hankard).

²¹⁵ See Ex. S3 at 5, 6-8 (Hessler Direct); *see also* Evid. Hrg. Tr. at 10 (April 18, 2019) (Draft Transcript) (Hessler).

²¹⁶ Ex. S3 at 6 (Hessler Direct); Ex. A17 at 2 (Hankard Rebuttal).

²¹⁷ See, e.g., Ex. S3 at 6-7 (Hessler Direct); Ex. A17 at 2, 4-5 (Hankard Rebuttal).

²¹⁸ Ex. A9 at 6 (Hankard Supplemental).

interest in noise compliance studies), emit a relatively continuous noise.²¹⁹ Continuous noise sources are best quantified using the Leq, which is suitable for use on a wide range of environmental noise sources and is by far the most commonly used metric by environmental acoustics professionals, noise standards, regulations, and ordinances for wind turbine projects, highways and airports.²²⁰ Second, the primary challenge in conducting wind turbine noise compliance surveys is separating the relatively constant wind turbine noise from the time varying noise made by all other noise sources in the environment, which is primarily that of the wind blowing through nearby vegetation, but also that produced by passing vehicles, barking dogs, etc.²²¹ Because the L10 represents the highest noise levels measured over a time interval, it better quantifies the non-turbine intermittent noise in the background than it does the constant noise from the wind turbines.²²² Due to what the L10 metric is specifically intended to measure, the L10 tends to represent the background noise rather than turbine noise and therefore using the L10 would be problematic.²²³ Third, a majority of the acoustic standards applicable to wind turbine projects quantify noise using the Leq metric.²²⁴ Manufacturers quantify noise from turbines using the Leq and propagation models specify the Leq, as so do environmental noise measurement standards.²²⁵ The primary method of measuring compliance and of separating turbine and non-turbine noise, using ANSI S12.9 Part 3, is designed to be used with the Leq.²²⁶

105. The record demonstrates that ambient sound modeling (a community noise assessment) is not warranted. As Mr. Hessler testified, ambient (background) noise levels in rural areas “all over the country” are “remarkabl[y]” similar²²⁷ and ambient sound surveys “tend to be repetitive” and “[t]end to get the same results.”²²⁸ Further, Mr. Hessler noted that other projects recently permitted by the Commission have also not conducted a community noise assessment.²²⁹

106. Section 1215.03(13)(b) of the Deuel County Zoning Ordinance states the following: “Limit for allowable shadow flicker at existing residences to no more than 30 hours annually.”

107. The record demonstrates that Deuel Harvest has minimized impacts from shadow flicker.²³⁰ The Project is not projected to result in shadow flicker levels above 30 hours per year

²¹⁹ Ex. A9 at 6 (Hankard Supplemental).

²²⁰ Ex. A9 at 6 (Hankard Supplemental).

²²¹ Ex. A9 at 6 (Hankard Supplemental).

²²² Ex. A9 at 6-7 (Hankard Supplemental).

²²³ Ex. A9 at 7 (Hankard Supplemental).

²²⁴ Ex. A9 at 7 (Hankard Supplemental).

²²⁵ Ex. A9 at 7 (Hankard Supplemental).

²²⁶ Ex. A9 at 7 (Hankard Supplemental).

²²⁷ Evid. Hrg. Tr. at 12 (April 18, 2019) (Draft Transcript) (Hessler) (“I’ve done I would estimate 50 to 60 ambient studies before wind projects are built, and just about all wind projects are in rural areas to begin with. It’s remarkable how similar the background is all over the country. Almost to the point where I feel like it’s not even necessary to do the survey. You can also guess what the level’s going to be. ... What we find is that level is often in the 35 to 40 range.”).

²²⁸ Evid. Hrg. Tr. at 45 (April 18, 2019) (Draft Transcript) (Hessler).

²²⁹ Evid. Hrg. Tr. at 40-41 (April 18, 2019) (Draft Transcript) (Hessler).

²³⁰ See, e.g., Ex. A1 at § 15.5.2 (Application); Ex. A18-1 (Updated Shadow Flicker Analysis).

at any inhabited residence. Therefore, the Project will comply with the Deuel County Zoning Ordinance.²³¹

108. The record demonstrates that the 30 hour/year limit is an appropriate limit.²³² There is no federal standard for shadow flicker exposure from wind turbines, and state and local standards are uncommon.²³³ This standard is commonly applied in regulatory proceedings in other jurisdictions.²³⁴ The 30-hour-per-year limit is a reasonable limit that can be used to site wind turbines in a responsible manner. This limit was established by Deuel County after a zoning amendment process. It is the appropriate community standard for the Project based on that community process and based on the fact that the 30-hour annual limit is a typical standard in the United States for shadow flicker when a limit is established, and that there is no evidence of health effects caused by shadow flicker, at any level.²³⁵

109. The record does not support a limit on minutes of shadow flicker per day.²³⁶ As Deuel Harvest's expert Ms. Blank testified, there are approximately 4,463 hours of daylight in South Dakota annually. The more appropriate tool for limiting shadow flicker is the 30-hour per year limit. In percentage terms, 30 hours represents less than 1 percent of daylight hours.²³⁷

110. There is no record evidence that the proposed Project will have adverse impacts on human health.²³⁸ Construction and placement of facilities meet or exceed industry standards

²³¹ Ex. A18 at 2 (Blank Rebuttal); Ex. A18-1 at 5 (Updated Shadow Flicker Analysis).

²³² See Ex. A8 at 1-2, 3-4 (Blank Supplemental).

²³³ Ex. A6 at 4 (Blank Direct) and Ex. A8 at 1 (Blank Supplemental).

²³⁴ See Ex. A8 at 1-2 (Blank Supplemental); see also, e.g., *In the Matter of the Application of Freeborn Wind Energy LLC for a Large Wind Energy Conversion System Site Permit for the up to 84 MW Freeborn Wind Farm in Freeborn County*, Minnesota Public Utilities Commission Docket WS-17-410, Minnesota Department of Commerce Energy Environmental Review and Analysis ("EERA") Comments and Recommendations on Draft Site Permit at 18 (December 5, 2017) (eDocket No. [201712-137950-01](#)) ("Some of the comments indicated that non-participants should not experience more than 30 hours of shadow flicker per year. 30 hours of flicker per year was a suggested standard in a couple sources of information reviewed by EERA, but those sources do not provide supporting scientific data that would suggest there is a link between shadow flicker in excess of 30 hours per year of exposure and negative human health impacts."); *In the Matter of the Application of Lindahl Wind Project, LLC's Application for a Certificate of Site Compatibility for the Lindahl Wind Farm Project in Williams County, North Dakota*, Docket PU-15-482, North Dakota Public Service Commission Findings of Fact, Conclusions of Law and Order, (Dec. 2, 2016) at Order ¶ 8.

²³⁵ Ex. A8 at 3-4 (Blank Supplemental); see also Ex. A11 at 6 (Ellenbogen Supplemental); Ex. A12 at 10-11 (Roberts Supplemental); Evid. Hrg. Tr. at 208 (April 16, 2019) (Draft Transcript) (Ellenbogen).

²³⁶ Ex. A8 at 2-3 (Blank Supplemental).

²³⁷ Ex. A8 at 3 (Blank Supplemental).

²³⁸ See, e.g., Ex. A12 at 6-7, 8-9, 14 (Roberts Supplemental); Ex. A11 at 5 (Ellenbogen Rebuttal) ("None of the limited epidemiological evidence reviewed suggested an association between noise from wind turbines and a wide range of topics we considered: pain, stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and/or headache/migraine. In addition, claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. . . . We did not find evidence in the human or animal literature to support that vibrations of the kind produced by a wind turbine could influence the vestibular system."); Ex. A11 at 12 (Ellenbogen Supplemental) ("This rigorous study demonstrated no relationship between noise from wind turbines and a wide variety of subjective and objective measures of adverse health outcomes. More simply, the most comprehensive study of the effect of wind turbine noise on human health to date did not show adverse health effects at sound levels up to 46 dBA at the receptor."); Ex. A19 at 2 (Ellenbogen Rebuttal) ("there is not only 'insufficient evidence to establish a significant risk to human health,' but also, there is now evidence to establish that there is not a significant risk to human health."); Evid. Hrg. Tr. at 134-35, 143, 144, 152-53, 169-70

established for protection of the health and welfare of residences and businesses in and around the Project.²³⁹ Further, in a previous wind docket, the South Dakota Department of Health provided Staff with a letter stating that the Department of Health has not taken a formal position on the issue of wind turbines and human health.²⁴⁰ The South Dakota Department of Health referenced the Massachusetts Department of Public Health and Minnesota Department of Health studies and noted that those studies generally conclude that there is insufficient evidence to establish significant risk to human health.²⁴¹

111. Deuel Harvest offered the testimony of two highly qualified medical doctors with unchallenged credentials: Dr. Mark Roberts and Dr. Jeff Ellenbogen. Dr. Roberts is a medical doctor and a PhD epidemiologist who spent 18 years working in public health with the Oklahoma State Department of Health.²⁴² Dr. Ellenbogen, also a medical doctor, is a Board-certified neurologist and spent five years as a professor of neurology at The Johns-Hopkins University School of Medicine.²⁴³ Both Dr. Roberts and Dr. Ellenbogen testified that there is no scientific evidence that wind turbines cause adverse health effects.²⁴⁴

112. The testimony of Deuel Harvest's medical doctors was unrebutted. Intervenor did not present any expert medical testimony. While Intervenor Kilby submitted pre-filed testimony from Mr. Robert Rand, he was precluded from testifying regarding health effects because he lacks the education, training, and experience to provide expert testimony on health effects.²⁴⁵ Accordingly, the hearing examiner ordered redactions of Mr. Rand's pre-filed testimony and exhibits to reflect the hearing examiner's ruling that Mr. Rand is not qualified to testify about health effects.²⁴⁶

113. Deuel Harvest's two independent medical experts, Dr. Roberts and Dr. Ellenbogen, provided extensive testimony confirming that there is no scientifically proven link between wind turbines and any adverse health effect.²⁴⁷ Dr. Roberts concluded that there is no

(April 16, 2019) (Draft Transcript) (Roberts); Evid. Hrg. Tr. at 175, 184, 202-03, 208 (April 16, 2019) (Draft Transcript) (Ellenbogen).

²³⁹ See, e.g., Ex. A1 at Ch. 8.0, 24.0 (Application).

²⁴⁰ Ex. A12-2 (Letter, Kim Malsam-Rysdon, Secretary of Health, South Dakota Department of Health (Oct. 13, 2017)); see *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Exhibit S1 at DK-4, Letter, Kim Malsam-Rysdon, Secretary of Health, South Dakota Department of Health (Oct. 13, 2017) ("These studies generally conclude that there is insufficient evidence to establish a significant risk to human health.").

²⁴¹ Ex. A12-2 (Letter, Kim Malsam-Rysdon, Secretary of Health, South Dakota Department of Health (Oct. 13, 2017)); Ex. A19 at 2-3 (Ellenbogen Rebuttal).

²⁴² See Ex. A12-1 (Roberts Statement of Qualifications); Ex. A12 at 1-2 (Roberts Supplemental).

²⁴³ See Ex. A11-1 (Ellenbogen Statement of Qualifications); Ex. A11 at 1 (Ellenbogen Supplemental).

²⁴⁴ See, e.g., Ex. A11 at 5 (Ellenbogen Supplemental); Ex. A19 at 2 (Ellenbogen Rebuttal); Ex. A12 at 6-7, 9, 10-11 (Roberts Supplemental); Evid. Hrg. Tr. at 134-35, 143, 144, 152-53, 169-70 (April 16, 2019) (Draft Transcript) (Roberts); Evid. Hrg. Tr. at 175, 184, 202-03, 208 (April 16, 2019) (Draft Transcript) (Ellenbogen).

²⁴⁵ See Evid. Hrg. Tr. at 193, 195-96 (April 18, 2019) (Draft Transcript).

²⁴⁶ Evid. Hrg. Tr. at 195-97 (April 18, 2019) (Draft Transcript).

²⁴⁷ See, e.g., Ex. A11 at 5 (Ellenbogen Supplemental); Ex. A19 at 2 (Ellenbogen Rebuttal); Ex. A12 at 6-7, 9, 10-11 (Roberts Supplemental); Evid. Hrg. Tr. at 134-35, 143, 144, 152-53, 169-70 (April 16, 2019) (Draft Transcript) (Roberts); Evid. Hrg. Tr. at 175, 184, 202-03, 208 (April 16, 2019) (Draft Transcript) (Ellenbogen).

peer-reviewed, scientific data to support a claim that wind turbines are causing disease or specific health conditions.²⁴⁸

114. Dr. Ellenbogen participated in a panel that conducted a Massachusetts health impact study, which concluded that wind turbines do not pose a risk to human health. The panel “specifically evaluated the merits of ‘wind turbine syndrome’” and “found no basis for a set of health effects from wind turbines.”²⁴⁹ He also evaluated four individuals claiming to suffer from “wind turbine syndrome” and found that the claims could not be substantiated and in fact prevented the individuals from seeking appropriate treatment.²⁵⁰ Dr. Ellenbogen testified: “[I]n my opinion, the misapplied blame to wind turbines prevented these individuals from seeking and obtaining much-needed medical treatment for their underlying conditions.”²⁵¹

115. There is no evidence in the record to support a finding that wind turbines cause adverse health effects.²⁵² This conclusion has been reached by well-respected, governmental agencies charged with protecting public health that have evaluated the available evidence and concluded that wind turbines are not a cause of adverse health effects.²⁵³ For example, Health Canada has recently completed and published the work of its major study that formally investigated the potential for wind turbine noise to impact human health.²⁵⁴ As Dr. Ellenbogen testified the Health Canada study “is by far the largest and most comprehensive study on the topic of health effects for humans and wind turbines.”²⁵⁵ This research examined multiple dimensions, including stress, sleep, and cardiovascular disease. Researchers examined self-reported and objective measures of health-related outcomes associated with wind turbine noise of more than one thousand people exposed to outdoor calculated WTN levels up to 46 dBA.²⁵⁶ The overall conclusion of that work is that there were no positive associations between wind turbine noise and a wide variety of subjective and objective measures of adverse health outcomes. Specifically, the study did not show adverse health effects at sound levels up to 46 dBA at the receptor.²⁵⁷

116. With respect to sleep disturbance specifically, Dr. Ellenbogen referred to the recent study from Health Canada, which found no evidence of sleep disruption from wind turbines at up to 46 dBA.²⁵⁸ Specifically, the Health Canada study found that “[t]his demonstrated sensitivity, together with the observation that there was consistency between multiple measures of self-reported sleep disturbance and among some of the self-reported and

²⁴⁸ Ex. A12 at 6-7 (Roberts Supplemental); Evid. Hrg. Tr. at 135, 144 (April 16, 2019) (Draft Transcript) (Roberts).

²⁴⁹ Ex. A11 at 5 (Ellenbogen Supplemental).

²⁵⁰ Ex. A11 at 7 (Ellenbogen Supplemental).

²⁵¹ Ex. A11 at 9 (Ellenbogen Supplemental).

²⁵² See, e.g., Ex. A11 at 5, 9, 12 (Ellenbogen Supplemental); Ex. A12 at 3-5, 6-7, 8 (Roberts Supplemental); Ex. A19 at 2-3 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 134-35, 143, 144, 152-53, 169-70 (April 16, 2019) (Draft Transcript) (Roberts); Evid. Hrg. Tr. at 175, 184, 202-03, 208 (April 16, 2019) (Draft Transcript) (Ellenbogen).

²⁵³ See Ex. A12 at 6-7 (Roberts Supplemental).

²⁵⁴ See Ex. A19 at 2-3 (Ellenbogen Rebuttal); see also Ex. A11 at 6-7 (Ellenbogen Supplemental); Ex. A25 at 3 (Ellenbogen Surrebuttal).

²⁵⁵ Evid. Hrg. Tr. at 177 (April 16, 2019) (Draft Transcript) (Ellenbogen).

²⁵⁶ See Ex. A19 at 2-3 (Ellenbogen Rebuttal); see also Ex. A11 at 6-7 (Ellenbogen Supplemental); Ex. A25 at 3 (Ellenbogen Surrebuttal).

²⁵⁷ See Ex. A19 at 2-3 (Ellenbogen Rebuttal); see also Ex. A11 at 6-7 (Ellenbogen Supplemental); Ex. A25 at 3 (Ellenbogen Surrebuttal).

²⁵⁸ See Ex. A11 at 11-12 (Ellenbogen Supplemental).

actigraphy measures, lends strength to the robustness of the conclusion that [wind turbine noise] levels up to 46 dB(A) had no statistically significant effect on any measure of sleep quality.”²⁵⁹

117. Infrasound is generally defined as sound in the approximately 0 to 20 Hz frequency range.²⁶⁰ Infrasound is generated by both natural and man-made sources, including: the human heart, waves, lung and digestive tract sounds, naturally occurring winds, ventilation systems, machinery, and large combustion processes.²⁶¹ These sources are in the range of infrasound produced by wind turbines.²⁶² The levels of infrasound produced by wind turbines are not only below the threshold of human hearing but are multiple orders of magnitude below the threshold.²⁶³ There is no scientifically proven evidence of adverse effects in the range produced by wind turbines.²⁶⁴ As Staff’s witness Mr. Hessler testified, there are currently over 50,000 wind turbines installed in the United States, with self-reported adverse health effect complaints at only a very small number of those turbines.²⁶⁵

118. There is no scientific evidence indicating any demonstrated health effects arising from shadow flicker produced by wind turbines.²⁶⁶ Further, the record demonstrates that shadow flicker from turbines is not harmful to the health of photosensitive individuals, including those with epilepsy.²⁶⁷ Seizures that occur as a result of flashes of light may happen as a result of frequencies greater than 5 Hz, usually substantially higher.²⁶⁸ The frequency of any shadow flicker from wind turbines will be approximately 0.5 to 1 Hz, which is considerably below the range that would elicit a seizure even in someone who is vulnerable to seizures as a result of flashes of light.²⁶⁹ No supporting scientific data has been provided to suggest that there is a link between shadow flicker in excess of 30 hours per year of exposure and negative human health impacts.²⁷⁰

119. Overall, the record shows that Deuel Harvest has met its burden to demonstrate that the Project will not substantially impair human health; indeed, there is no evidence in the record that the Project would impair human health (substantially or insubstantially).

²⁵⁹ Ex. A11-5 at 107 (Michaud et al., *Effects of Wind Turbine Noise on Self-Reported and Objective Measures of Sleep* (2016)) (emphasis added).

²⁶⁰ Ex. A12 at 9 (Roberts Supplemental).

²⁶¹ Ex. A12 at 9 (Roberts Supplemental).

²⁶² Ex. A12 at 9 (Roberts Supplemental).

²⁶³ Ex. A17 at 5 (Hankard Rebuttal); Ex. A19 at 5-6 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 197-98 (April 16, 2019) (Draft Transcript) (Ellenbogen).

²⁶⁴ See Ex. A12 at 9 (Roberts Supplemental); Evid. Hrg. Tr. at 152-53, 169-70 (April 16, 2019) (Draft Transcript) (Roberts); Ex. A19 at 3-4 (Ellenbogen Rebuttal).

²⁶⁵ See Evid. Hrg. Tr. at 18 (April 18, 2019) (Draft Transcript) (Hessler) (“The Shirley project had six turbines and lots of people upset. There’s 56 thousand wind turbines in this country, and all we ever hear about is Shirley from years ago. If this were a common problem that was multiplied by the number of turbines, we’d be hearing about all kinds of projects with this problem. In South Dakota there’s 15 projects, 1,000 megawatts operating. Does anyone know of any problems in this state from any of those projects in terms of infrasound? I wasn’t able to find anything.”).

²⁶⁶ Ex. A11 at 6 (Ellenbogen Supplemental); Ex. A12 at 10-11 (Roberts Supplemental); Evid. Hrg. Tr. at 208 (April 16, 2019) (Draft Transcript) (Ellenbogen).

²⁶⁷ See Ex. A11 at 6 (Ellenbogen Supplemental); Ex. A12 at 10-11 (Roberts Supplemental).

²⁶⁸ Ex. A11 at 6 (Ellenbogen Supplemental); Ex. A12 at 10-11 (Roberts Supplemental).

²⁶⁹ Ex. A11 at 6 (Ellenbogen Supplemental); Ex. A12 at 10-11 (Roberts Supplemental).

²⁷⁰ Ex. A11 at 6-7 (Ellenbogen Supplemental); Ex. A12 at 11 (Roberts Supplemental).

120. The record demonstrates that Deuel Harvest has taken appropriate measures to avoid and/or minimize the risk of ice throw occurring.²⁷¹ Although icing can occur on turbine blades during freezing rain conditions, the record demonstrates that it is not common and is generally controlled by ice detection systems on the turbines.²⁷² Commission Staff and Deuel Harvest have agreed upon a condition with respect to icing that is consistent with prior Commission orders and is designed to avoid and minimize ice throw.²⁷³ Turbine control systems would either automatically shut down the turbine(s) in icing conditions, or Deuel Harvest would manually shut down turbine(s) if icing conditions are identified (using meteorological data).²⁷⁴ Turbines would not return to normal operation until the control systems indicate icing is no longer a concern.²⁷⁵ Deuel Harvest will also be responsible for all documented damages caused by ice thrown from a turbine.²⁷⁶

121. The evidence presented in the record demonstrates that Project setbacks and Deuel Harvest's and Staff's proposed permit condition regarding turbine icing will protect human health and safety.²⁷⁷ Deuel Harvest provided testimony from Mr. Jacob Baker, the Director of Operations and Maintenance, Renewables, at Invenergy, who has more than thirteen years of experience working with site operations and maintenance of wind energy facilities.²⁷⁸

122. The evidence presented in the record demonstrates that Project setbacks and the condition proposed above will protect human health and safety.²⁷⁹ In addition to the testimony by Mr. Baker, Deuel Harvest provided written confirmation from General Electric ("GE") that the methods Mr. Baker described above to detect icing are "the method employed by GE to sense and assess ice build-up on the blades and to control the machine appropriately, and that GE's recommended setback guidance of *1.1*Tip Height* is intended to cover residual risks of blade icing."²⁸⁰ As such, Project setbacks are consistent with the setbacks recommended by GE in its Setback Considerations for Wind Turbine Siting.²⁸¹ The real-world data and experience, coupled with the manufacturer recommendations and turbine control software, show that the Project as designed is appropriately sited and will minimize the potential for ice throw.

123. The record demonstrates that Deuel Harvest has taken appropriate measures to avoid and/or minimize the risk of fire at the Project.²⁸² Turbine fires are rare. As Mr. Baker testified, he is aware of one turbine fire on all of Invenergy's wind farms, and that fire burned itself out.²⁸³ Turbines are constructed of fiberglass and steel, which are not highly flammable

²⁷¹ See, e.g., Ex. A13 at 2-5 (Baker Supplemental); Evid. Hrg. Tr. at 55-56 (April 18, 2019) (Draft Transcript) (Baker).

²⁷² Ex. A13 at 2 (Baker Supplemental); Ex. A16 at 1 (Baker Rebuttal).

²⁷³ Ex. A13 at 2-3 (Baker Supplemental).

²⁷⁴ Ex. A13 at 2-3 (Baker Supplemental).

²⁷⁵ Ex. A13 at 2-3 (Baker Supplemental).

²⁷⁶ Applicant's and Staff's Updated Proposed Permit Conditions at ¶ 41.

²⁷⁷ See, e.g., Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1 (Baker Rebuttal); see also Applicant's and Staff's Updated Proposed Permit Conditions at ¶ 41.

²⁷⁸ See Ex. A13 at 1 (Baker Supplemental).

²⁷⁹ See, e.g., Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1 (Baker Rebuttal); see also Applicant's and Staff's Updated Proposed Permit Conditions at ¶ 41.

²⁸⁰ Ex. A40 (Emails regarding Ice Build-Up on Blades).

²⁸¹ Ex. A13 at 5 (Baker Supplemental).

²⁸² See, e.g., Ex. A16 at 3-4 (Baker Rebuttal); Evid. Hrg. Tr. at 88-89 (April 18, 2019) (Draft Transcript) (Baker).

²⁸³ Ex. A16 at 3 (Baker Rebuttal).

materials.²⁸⁴ Further, Deuel Harvest will take steps to reduce the risk of fire at the Project. Deuel Harvest will acquire turbines from reputable suppliers.²⁸⁵ With respect to Project maintenance activities, a rigorous hot works program (a program to reduce risks associated with an activity, such as welding, which provides an ignition source) is adhered to whenever any open flames or heat sources are introduced in a tower.²⁸⁶ All up tower entries require a fire extinguisher be taken up the tower. All employees are trained annually on use.²⁸⁷ Additionally, Deuel Harvest will coordinate fire emergency plans and hold emergency response drills at the Project with local fire departments both before the Project becomes operational and annually thereafter.²⁸⁸

124. The record demonstrates that Deuel Harvest has avoided and/or mitigated impacts to aviation. The FAA has issued a Determination of No Hazard for each of the Project's proposed turbine sites.²⁸⁹

125. Intervenors John Homan and Garrett Homan both testified concerning their grass airstrip ("Homan Airstrip"), which is currently being graded in the middle of a cultivated field.²⁹⁰ The Homans provided no expert testimony on the design of the airstrip. Mr. Garrett Homan directly disqualified himself from offering any testimony on airport design: "I'm not asserting I'm an expert in airport design or the acquisition of any sort of land or air rights".²⁹¹ He also is not involved in the construction of the airstrip; his father is responsible for the construction.²⁹²

126. The Homan Airstrip, if built, would be a private use airport and does not have an FAA approved instrument approach procedure.²⁹³ The FAA does not require private air strips to acquire air rights over neighboring properties and does not afford airspace protections to private use airports without an FAA-approved instrument approach procedure.²⁹⁴ John Homan received an SEP for the Homan Airstrip from Deuel County; Deuel County required him to submit a letter of assurance stating: "Applicant hereby acknowledges that the only way to be guaranteed unrestricted access to the airspace over the neighbor's property is to secure those rights from the adjacent property owners. By signing this letter of assurance, Applicant does not waive any legal rights to which he is entitled. That the applicant communicates with their adjacent property owners."²⁹⁵ At the evidentiary hearing, John Homan did not dispute these requirements.²⁹⁶

²⁸⁴ Ex. A16 at 3 (Baker Rebuttal).

²⁸⁵ Ex. A16 at 3 (Baker Rebuttal).

²⁸⁶ Ex. A16 at 3 (Baker Rebuttal).

²⁸⁷ Ex. A16 at 3 (Baker Rebuttal).

²⁸⁸ Ex. A16 at 4 (Baker Rebuttal).

²⁸⁹ Ex. S7 at 31 (Applicant's Additional Data Request Responses to Staff) (Public).

²⁹⁰ Pub. Hrg. Tr. at 12-16 (Mar. 27, 2019) (J. Homan); Ex. G1 (Homan Direct); *see also* Ex. JH15 at Photo 5 (Pictures).

²⁹¹ Evid. Hrg. Tr. at 140 (April 18, 2019) (Draft Transcript) (G. Homan).

²⁹² Evid. Hrg. Tr. at 147 (April 18, 2019) (Draft Transcript) (G. Homan). Despite Mr. Garrett Homan's lack of qualifications to design an airstrip, he has been "involved in kind of the siting and layout" of the Homan Airstrip. *Id.* Mr. Garrett Homan also testified that he has landed approximately 20 times on a grass airstrip. *Id.* at 151.

²⁹³ Ex. A21 at 5 (Doyle Rebuttal); *see also* Ex. A31-1 at 16-17 (Applicant's First Set of Data Requests to Intervenor John Homan and Responses); Evid. Hrg. Tr. at 122 (April 18, 2019) (Draft Transcript) (G. Homan).

²⁹⁴ Ex. A21 at 8 (Doyle Rebuttal).

²⁹⁵ Ex. A31-1 at 16 (Applicant's First Set of Data Requests to Intervenor John Homan and Responses).

127. Intervenor John Homan testified that he understood from the grant of his SEP and the Letter of Assurance that he needed to obtain rights from adjacent property owners to have unrestricted access to the air space, as evidenced in the following exchange with Commissioner Nelson:

COMMISSIONER NELSON: In your Rebuttal Testimony you included this letter of assurance that you signed [acknowledging that the only] way you could be guaranteed unrestricted access to airspace on a neighbor's property would be to secure those rights from the adjacent owner.

It appears to me that you knew that up front before you began constructing your airstrip but today you're here asking us for something different than that. Is that correct[?]

THE WITNESS: The letter of assurance that we signed was requested [by] zoning board after, you know three, four months of negotiations with them.

The letter we agreed to states what is in the law, that if we request unrestricted airspace, that we would need to get -- at the time, as I understand, there were no restriction -- there was no obstacles in the area that would restrict our permit at the time that I was granted the permit for it.

COMMISSIONER NELSON: And so perhaps what they were telling you by making sure you signed this is if in fact you wanted to guarantee that it stayed that way you would need to acquire those rights; is that correct?

THE WITNESS: That I think is the way I understand the law itself. Correct.²⁹⁷

128. Despite acknowledging to Deuel County that he is not entitled to unrestricted airspace over those properties, Mr. John Homan has neither sought nor received any airspace or avigational easements from his neighbors (Mr. Doyle Thompson and Mr. Darold Hunt).²⁹⁸ Nonetheless, the Homans ask the Commission to remove six turbine locations proposed on their neighbors' property because of his airstrip that he hopes will support several landings per year.²⁹⁹

²⁹⁶ See Evid. Hrg. Tr. at 35-36 (April 18, 2019) (Draft Transcript) (J. Homan); see also Ex. A31-2 at 2 and 7 (Applicant's First Set of Data Requests to Intervenor John Homan and Responses).

²⁹⁷ Evid. Hrg. Tr. at 35-36 (April 18, 2019) (Draft Transcript) (Commissioner Nelson and J. Homan).

²⁹⁸ Evid. Hrg. Tr. at 29-30 (April 18, 2019) (Draft Transcript) (J. Homan).

²⁹⁹ Evid. Hrg. Tr. at 29 (April 18, 2019) (Draft Transcript) (J. Homan). Mr. J. Homan also testified that his family uses the property where the airstrip is located "several times a year." *Id.* at 31.

Mr. Thompson, one of the affected neighbors, testified that losing a single turbine would result in a financial loss of more than six figures over the life of the Project.³⁰⁰

129. The Homans appear to variously assert that FAA guidelines and regulations should apply, and not apply, to the Homan Airstrip. For example, Mr. Garrett Homan apparently asserts that the Commission should apply airspace protections to the Homan Airstrip that the FAA could apply to a public airport.³⁰¹ However, the Homan Airstrip is not a public airport.³⁰²

130. The FAA counsels that even public airports are responsible for obtaining their own airspace rights through easements, eminent domain, or zoning. Specifically, the FAA “Conditional No Objection” regarding the Homan Airstrip states: “The airport environment can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreements, or other means.”³⁰³

131. In a guidance document, the FAA explains, for example: “Airports that do not own the entire [runway protection zone (“RPZ”)] should consider the need to acquire such land if there is any possibility that incompatible land uses could occur within the RPZ. In particular easements should be reviewed to ensure that land uses are restricted not to just obstructions. Where necessary, requests should be made to the appropriate zoning authority to rezone such land to prevent future incompatible use. Where neither zoning nor easements are adequate the RPZ should be acquired in fee.”³⁰⁴

132. Mr. Garrett Homan asserted that he is not required to obtain property rights for the RPZ that extends beyond the southern boundary of the Homan property that would be required for the Homan Airstrip by the FAA because it is not a public airport.³⁰⁵

133. Mr. Garrett Homan relies upon a “qualitative” paper (the “COPA Paper”) to support his arguments and admitted that the one source he had been able to find that was cited in that paper speaks only to waking and says nothing about interactions with aircraft.³⁰⁶ Despite his efforts to do so, Mr. Garrett Homan was unable to contact the authors of the COPA Paper. Mr. Garrett Homan further acknowledged that the COPA Paper: indicated that the risk it purported to assess was at the infrequent end of the frequency spectrum; did not include quantitative data regarding the interaction of wind turbines and aircraft; described risks as “remote”; and cites to non-scientific references.³⁰⁷

³⁰⁰ Evid. Hrg. Tr. at 49-50 (April 17, 2019) (Draft Transcript) (Thompson).

³⁰¹ See, e.g., Ex. G1 at 4 (G. Homan Direct); Ex. G9 at 5 (G. Homan Rebuttal); Ex. S1 at 16-17 (Thurber Direct).

³⁰² Evid. Hrg. Tr. at 122 (April 18, 2019) (Draft Transcript) (G. Homan); Ex. G1 at 3 (G. Homan Direct).

³⁰³ Ex. JH30.

³⁰⁴ Ex. A42 at 500-15; see also *id.* at 500-17 (explaining purpose and need for aviation easements).

³⁰⁵ Mr. Garrett Homan also stated that he has designed the Homan Airstrip for Category B aircraft. However, based upon the review of Mr. Doyle and Mr. Rice, the airstrip is likely not usable by Category B aircraft. In addition, Mr. Garrett Homan further stated that he was not qualified to design an airport and has not been involved in its construction. Evid. Hrg. Tr. at 164 (April 17, 2019) (Draft Transcript) (Doyle). Mr. Garrett Homan also testified that he did not know if RPZs applied to private airstrips. Evid. Hrg. Tr. at 154 (April 18, 2019) (Draft Transcript) (G. Homan) at 154.

³⁰⁶ Evid. Hrg. Tr. at 130-31, 134 (April 18, 2019) (Draft Transcript) (G. Homan).

³⁰⁷ Evid. Hrg. Tr. at 123-34 (April 18, 2019) (Draft Transcript) (G. Homan).

134. Mr. Garrett Homan also introduced testimony from Mr. Kevin Elwood, a pilot in Canada. Mr. Elwood is not an expert in U.S. aviation regulations, has no formal engineering training, has no expertise regarding wind turbines, and did not have an independent basis for the opinions he was offering.³⁰⁸

135. Deuel Harvest presented testimony from Mr. Doyle, the president and owner of Capitol Airspace Group, LLC, and a former U.S. Army air traffic controller, describing federal and state airspace regulations and explaining that they do not grant protections to private airstrips like the Homan Airstrip.³⁰⁹ Mr. Doyle explained that the FAA is the preeminent regulator of flight safety regulations and that it does not restrict turbines in the vicinity of private airstrips and also that it has issued Determinations of No Hazard for each of the Project's turbine locations.³¹⁰ Mr. Doyle further explained that "none of the proposed turbines penetrate the 20:1 surfaces for [the Homan Airstrip] and therefore would not have been deemed to have an impact on the airport."³¹¹ Similarly, Mr. Doyle stated that, even if the Homan Airstrip were treated as public, the closest turbine (Turbine No. 108) "is actually located just outside of the VFR traffic pattern area."³¹² Mr. Doyle further testified that if the Homan Airstrip were a public airport with VFR, the FAA would issue Determinations of No Hazard for all proposed turbine locations near the Homan Airstrip.

136. Deuel Harvest has demonstrated that the Project does not present a safety issue with respect to the Homan Airstrip. Specifically, Mr. Rice, with Capitol Airspace Group, LLC and pilot and former Marine Corps Officer, testified that: (1) The Homan Airstrip has been designed for small general aviation aircraft for which there are crosswind limitations;³¹³ (2) In a study of aviation and wind turbine wakening based on real-world conditions, pilots reported that "corrected control inputs were accomplished with minimal urgency." Mr. Rice compared this to "hitting a bump;"³¹⁴ and (3) Turbine wakening would not occur under all circumstances. Where it would occur, the crosswind component would be such that it would not be safe for small general aviation aircraft like those proposed by the Homans to land or depart from the Homan Airstrip.³¹⁵

137. The FAA prescribes that general aviation aircraft pilots (like Mr. Garrett Homan would be) should maintain between 500 feet (less populated areas) and 1,000 feet (populated

³⁰⁸ Evid. Hrg. Tr. at 254-66 (April 17, 2019) (Draft Transcript) (Elwood).

³⁰⁹ See Ex. A21 (Doyle Rebuttal).

³¹⁰ Evid. Hrg. Tr. at 160-62, 163 (April 17) (Draft Transcript) (Doyle); Ex. A21 at 3-4, 9-11 (Doyle Rebuttal); see also Ex. S7 at 31 (Applicant's Additional Data Request Responses to Staff) (Public).

³¹¹ Ex. A21 at 12 (Doyle Rebuttal).

³¹² Evid. Hrg. Tr. at 163 (April 17, 2019) (Draft Transcript) (Doyle).

³¹³ Evid. Hrg. Tr. at 134-35 (April 18, 2019) (Draft Transcript) (Rice).

³¹⁴ Evid. Hrg. Tr. at 146-47 (April 18, 2019) (Draft Transcript) (Rice).

³¹⁵ Evid. Hrg. Tr. at 139-40 (April 18, 2019) (Draft Transcript) (Rice) ("[I]f you look at the orientation of that north south runway with the project area and where the turbines are located, as I previously discussed regarding crosswind limitations, if the wind was blowing strong enough to preclude take off due to crosswind, then the aircraft would not be flying even if the turbines didn't exist."); see also *id.* at 148-49 ("I believe that based off of the orientation of where the project area is and where those turbines are [sited] and the orientation of his north sound runway I do not believe that if the wind was blowing severe enough to create wing tip vortices that would be a hazard to general aviation aircraft that he would want to fly anyway on that day, even if the turbines didn't exist, because of the excessive crosswind component blowing from west to east. And I back that opinion up based on my own experience of never having experienced any type of turbulence anywhere in the vicinity of a wind turbine in a low altitude environment.").

areas) between their aircraft and any obstacle (include wind turbines).³¹⁶ The closest wind turbine to the Homan Airstrip is 2,430 feet; the closest wind turbine to the purported Homan Airstrip approach surface is 1,593 feet.³¹⁷

138. The record demonstrates that Homan Airstrip will not be frequently used. For example, Mr. Homan testified that he “hope[s] to have several” landings per year at the Homan Airstrip.³¹⁸ However, given the fact that the FAA’s approval of the Homan Airstrip was conditioned upon it being for private use only, it is unclear who exactly Mr. Homan contemplates using the airstrip. Similarly, weather conditions will limit the use of the airstrip; for example, as noted above, crosswind limitations will limit operations, and it is generally not safely feasible to land small general aviation aircraft at a grass landing strip (such as the Homan Airstrip) during frozen ground conditions.³¹⁹

D. The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

139. The record demonstrates that the Project will not unduly interfere with the orderly development of the region. The Project complies with all applicable local land use requirements, and the evidence demonstrates that Deuel Harvest has worked cooperatively with local governments.

140. On March 2, 2018, the Deuel County Board of Adjustment (“County Board”) issued a Special Exception Permit (“SEP”) for the Project. On March 27, 2019, a South Dakota Circuit Court held that two of the County Board members should not have participated in voting on the Project SEP because they had previously held easements for the Project, even though those agreements were terminated before Deuel Harvest submitted its SEP application. Deuel Harvest has appealed that decision. Additionally, on April 5, 2019, Deuel Harvest submitted a new SEP application for the Project to the County Board. The County Board meeting at which the SEP application will be considered is scheduled for May 8, 2019.

141. Intervenors take issue with Deuel County’s interpretation of its Zoning Ordinance. As an initial matter, the local development of zoning regulations is outside the scope of the Commission’s jurisdiction and is not relevant to this proceeding. The Commission must give due consideration to the views of governing bodies of affected local units of government pursuant to SDCL 49-41B-22(4).³²⁰ Further, the County’s interpretation of its own ordinance is entitled to deference.³²¹ Article VI of the Deuel County Ordinance provides that “all questions of interpretation and enforcement shall be first presented to the County Zoning Officer, and that such questions shall be presented to the Board of Adjustment only on appeal from the decision of the Zoning Officer[.]” In response to a request from Staff, the Deuel County Zoning Officer

³¹⁶ Evid. Hrg. Tr. at 1269 (April 18, 2019) (Draft Transcript) (Doyle).

³¹⁷ Evid. Hrg. Tr. at 172-74 (April 18, 2019) (Draft Transcript) (Doyle).

³¹⁸ Evid. Hrg. Tr. at 28 (April 18, 2019) (Draft Transcript) (J. Homan).

³¹⁹ Evid. Hrg. Tr. at 136 (April 18, 2019) (Draft Transcript) (Rice).

³²⁰ Ex. S1 at 23 (Thurber Direct).

³²¹ SDCL § 11-2-61.1 (providing that a court “shall give deference to the decision of the approving authority in interpreting the authority’s ordinances”).

provided stated that “the setback was from the Lake Park District at Lake Alice, not from Lake Alice itself.”³²² In addition, it is clear from the record that Deuel County’s intent was to craft an ordinance that created a two-mile setback from the Lake Park District at Lake Alice.³²³

142. Further, on April 16, 2019, Deuel Harvest submitted a request on April 16, 2019 to the County for an interpretation regarding Section 1215.03(2)(d) as it relates to the setback from the Lake Park District at Lake Alice. The Project is set back two miles from the Lake Park District at Lake Alice.³²⁴

143. Intervenors requested setbacks greater than those imposed by existing regulations from non-participating residences. There is no evidence in the record supporting additional setbacks from nonparticipating residences.³²⁵ The record demonstrates that the Project meets the Commission’s siting requirements applying the current setbacks, as well as Deuel County’s requirements under its Zoning Ordinance and Deuel Harvest’s commitments.³²⁶ Additionally, there is no reasonable basis in the record to support a two-mile setback from non-participating residences.

144. Intervenors also requested setbacks greater than those imposed by existing regulations from property lines. There is no evidence in the record supporting additional setbacks from nonparticipating property lines.³²⁷ The record demonstrates that the Project meets the Commission’s siting requirements applying the current setbacks, as well as Deuel County’s requirements under its Zoning Ordinance and Deuel Harvest’s commitments.³²⁸ Additionally, there is no reasonable basis in the record to support this request.³²⁹

145. Intervenors also requested setbacks greater than those imposed by existing regulations from public roads and right-of-ways. There is no evidence in the record supporting greater setbacks from public roads and right-of-ways.³³⁰ The record demonstrates that the Project meets the Commission’s siting requirements applying the current setbacks, as well as

³²² Ex. S1 at 23 (Thurber Direct).

³²³ See, e.g., Ex. A14-3 at 4-5 (Deuel County Commissioners Meeting Minutes (March 28, 2017)).

³²⁴ Ex. A14 at 7 (Svedeman Rebuttal).

³²⁵ See, e.g., Ex. A14 at 7 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental); Ex. S1 at 26-27 (Thurber Direct).

³²⁶ See, e.g., Ex. Ex. A2 at 8-9 (Svedeman Direct); Ex. A14 at 7, 15-16 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental).

³²⁷ See, e.g., Ex. A2 at 8-9 (Svedeman Direct); Ex. A14 at 15-16 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1, 2-3 (Baker Rebuttal).

³²⁸ See, e.g., Ex. A2 at 8-9 (Svedeman Direct); Ex. A14 at 7, 15-16 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1, 2-3 (Baker Rebuttal).

³²⁹ See Ex. A2 at 8-9 (Svedeman Direct); Ex. A14 at 15-16 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1, 2-3 (Baker Rebuttal).

³³⁰ See Ex. Ex. A2 at 8-9 (Svedeman Direct); Ex. A14 at 15-16 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1, 2-3 (Baker Rebuttal).

Deuel County's requirements under its Zoning Ordinance and Deuel Harvest's commitments.³³¹ Additionally, there is no reasonable basis in the record supporting this request.³³²

146. Mr. Heath Stone requests a 2,000-foot setback from his family's homestead at which there is currently an abandoned residence. Although Deuel Harvest previously met with Mr. Heath Stone regarding the Project during its development phase, he did not mention this request at that time.³³³ Deuel Harvest strives to cooperate with all landowners where it is aware of concerns and where it is possible to do so. For example, Deuel Harvest removed five turbines in response to the construction of residences by two participating landowners prior to Deuel Harvest's application to the Commission.³³⁴ In addition, Deuel Harvest treated the new residence for which a building permit has been issued on the Homan property as a non-participating residence (Receptor No. 803), as well as the existing structure on that property (Receptor No. 332).³³⁵ However, Deuel Harvest was not aware of Mr. Stone's request and his future plans and did not have the opportunity to try to incorporate such setbacks into the proposed Project layout submitted to the Commission.³³⁶ Further, the record reflects that Mr. Heath Stone has no current specific plans for re-constructing the homestead. It is abandoned, and there is no evidence that a building permit or other permit that has been issued for that property.³³⁷

CONCLUSIONS OF LAW

From the foregoing Findings of Fact and the record in this proceeding, the Commission now makes the following Conclusions of Law:

1. The Commission has jurisdiction to consider the Application under South Dakota Codified Law Chapter 49-41B.
2. The wind energy conversion facility proposed by Applicant is a wind energy facility as defined under South Dakota Codified Law 49-41B-2(13).
3. The Application submitted by Applicant meets the criteria required by South Dakota Codified Law 49-41B-25, and construction of the Project meets the requirements of South Dakota Codified Law 49-41B.

³³¹ See Ex. Ex. A2 at 8-9 (Svedeman Direct); Ex. A14 at 15-16 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1, 2-3 (Baker Rebuttal).

³³² See Ex. Ex. A2 at 8-9 (Svedeman Direct); Ex. A14 at 15-16 (Svedeman Rebuttal); Ex. A13 at 5 (Baker Supplemental); Ex. A16 at 1, 2-3 (Baker Rebuttal).

³³³ Ex. S7 at 7 (Applicant's Additional Data Request Responses to Staff).

³³⁴ Ex. A14 at 4-5 (Svedeman Rebuttal). The new homes are Receptor 804 (Toben LP) and 805 (Eugene Lorenzen). *Id.*

³³⁵ See Ex. A38 (Distance from Residences to the Nearest Wind Turbine, Modeled Shadow Flicker and Sound Levels) and Ex. A17-1 at A-5 (Update Pre-Construction Noise Analysis) and Ex. A26 (Updated Land Ownership Map). The existing building on the property is Receptor No. 332. *Id.*

³³⁶ Ex. S7 at 7-8 (Applicant's Additional Data Request Responses to Staff).

³³⁷ Evid. Hrg. Tr. at 211-12 (April 18, 2019) (Draft Transcript) (H. Stone); Ex. A31-5 (Applicant's First Set of Discovery Requests to Intervenor Heath Stone and Intervenor Heath Stone's Responses); Ex. S7 at 7-8 (Applicant's Additional Data Request Responses to Staff).

4. The Commission satisfied the hearing and notice requirement in South Dakota Codified Law Chapter 49-41B.

5. Applicant satisfied the applicable notice requirements in South Dakota Codified Law Chapter 49-41B.

6. Neither the Gen-Tie nor the Otter Tail Facilities are a “transmission facility” pursuant to SDCL 49-41B-2.1 because they will be less than one-half mile long, they will not cross a public highway, and eminent domain will not be used to acquire the right-of-way for the Gen-Tie or any Otter Tail Facilities. Therefore, no permit from the Commission is required for the construction, ownership, and operation of the Gen-Tie or Otter Tail Facilities.³³⁸

7. Applicant has demonstrated that the proposed facility will comply with all applicable laws and rules.

8. Applicant has demonstrated that the facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area.

9. Applicant has demonstrated that the facility will not substantially impair the health, safety or welfare of the inhabitants.

10. Applicant has demonstrated that the facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

11. All other applicable procedural requirements in South Dakota Codified Law Chapter 49-41B have been satisfied.

12. Whether the Deuel County Zoning Ordinance requires a two-mile setback from Lake Alice or a two-mile setback from the Lake Alice Park District is a determination for Deuel County to make. Deuel Harvest must comply with the requirements in the Deuel County Zoning Ordinance, as interpreted by Deuel County.

13. Whether the Deuel County Zoning Ordinance setback relating to businesses is a setback from a structure is a determination for Deuel County to make. Deuel Harvest must comply with the requirements in the Deuel County Zoning Ordinance, as interpreted by Deuel County.

14. No party has provided evidence sufficient for the Commission to impose a two-mile setback from the eagle nest north of Lake Alice.

15. No party has provided evidence sufficient for the Commission to impose a property value guarantee.

³³⁸ Ex. A33 at 2 (Stipulation).

16. No party has provided evidence sufficient for the Commission to impose a sound limit beyond those required by the Deuel County Zoning Ordinance.

17. No party has provided evidence sufficient for the Commission to impose a setback greater than that required by existing regulations from non-participating residences.

18. No party has provided evidence sufficient for the Commission to impose a setback greater than that required by existing regulations from property lines.

19. No party has provided evidence sufficient for the Commission to impose a setback greater than that required by existing regulations from all public roads and right-of-ways.

20. No party has provided evidence sufficient for the Commission to impose a setback from the Homan Airstrip.

21. No party has provided evidence sufficient for the Commission to impose a condition regarding decommissioning above and beyond the condition agreed to by Staff and Deuel Harvest.

22. To the extent that any Finding of Fact set forth above is more appropriately a conclusion of law, that Finding of Fact is incorporated by reference as a Conclusion of Law.

ORDER

From the foregoing Findings of Fact and Conclusions of Law, it is therefore:

ORDERED, that an energy facility permit is issued to Deuel Harvest Wind Energy LLC for the Deuel Harvest North Wind Farm.

ORDERED, that Applicant shall comply with the attached Permit Conditions, which are hereby incorporated into and made a part of this Order.

Dated on _____