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March 28, 2018

VIA ELECTRONIC FILING

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place E, Suite 350
St. Paul, Minnesota 55101

Re: Flying Cow Wind, LLC - Addendum to Site Permit Application for Bitter Root Wind Project
Docket No. IP-6984/WS-17-749

Dear Mr. Wolf:

On November 9, 2017, Flying Cow Wind, LLC ("Applicant" or "Flying Cow Wind") applied to the Minnesota Public Utilities Commission ("Commission") for a site permit to construct and operate the up to 152-megawatt ("MW") Bitter Root Wind Project ("Project") in Yellow Medicine County near the city of Canby, Minnesota. As proposed in the November 9, 2017 Application for a Large Wind Energy Conversion System Site Permit ("Application"), the Project would consist of the following: up to 37 wind turbines¹, gravel access roads, an electrical collection system, meteorological towers, a Project substation, an interconnection facility, a temporary concrete batch plant for construction, a temporary staging/laydown construction area, and an operations and maintenance (O&M) facility. The Project substation and associated overhead transmission line will be located in the adjacent county, Deuel County, South Dakota, and will be permitted separately. It should be noted that the original footprint of the Project ("Project Area") has not changed from the originally-filed Application and the overall assessment information of the Project Area remains the same.

This addendum serves to update and supplement the Application to incorporate a few minor changes to the Project, including using a single turbine type, adding turbines and additional alternate locations, shifting the access roads and the underground collection system, and shifting a meteorological tower site. These modifications are driven primarily by a change in turbine availability. Flying Cow Wind believes that the changes discussed below are not anticipated to result in a significant change in the potential impacts of the Project (and in some cases, reduce the potential impacts), and do not substantively change the findings or proposed mitigation presented in the November 9, 2017 Application. Pursuant to the requirements of Minnesota Rules Chapter 7854, Applicant is providing the following supplemental information to the originally filed Application:

I. Explanation of Layout Changes

a. Land Control

As shown on Figure 2 and discussed in Sections 5 and 8 of the Application, easements were still being negotiated with landowners for approximately ten parcels within the Project Area at the time the Application was submitted. Subsequently, these agreements have been finalized; however, the landowners for the parcel where turbines T3 and T4 were contemplated in the original Application did not agree to have wind turbines on their land, although they continue to be Project participants. The Project layout was revised to shift turbine T3 to participating land to the west (within the Project Area), and turbine T4 was eliminated.

b. Turbine Model and Number

The layout in the original Application included five 3.45 MW turbines and 32 4.2 MW turbines, for a total of 37 turbines (plus 3 Vestas V136 4.2 MW alternate turbines). Subsequently, Vestas informed the Applicant that the 4.2 MW turbine model is not likely to be available in 2019. Flying Cow Wind has revised the layout to include 44 Vestas V136 3.45 MW turbine locations, and 8 Vestas V136 3.45 MW

¹ Note that while up to 37 turbine sites were originally proposed to be constructed, the Application included 40 proposed turbine locations in the Project area, three of which were alternate turbine locations.



alternate turbine locations (A3, A4, A7, A8, A9, A10, A13, A14). The nameplate capacity to be permitted remains unchanged at up to 152 MW.²

c. Related Layout Shifts

Due to the changes in turbine availability and thus the turbine layout, the associated access roads and underground collection lines were shifted, as well as one of the two proposed permanent meteorological towers.

d. Avoidance Shifts

Flying Cow Wind also made additional adjustments to the turbine pads, access roads, and underground collection lines following results of wetland and native prairie surveys conducted in the fall of 2017. The purpose of the adjustments was to avoid (where possible) or further minimize impacts to applicable resources. Examples include narrowing the construction corridor and/or areas, slight route changes to access roads and/or collection lines, and slight crane path route changes.

e. Wind Access Buffer Setback

The Commission General Permit Standards include a wind access buffer setback intended to reduce disruption of the normal wind flow and protect the wind rights of non-participating landowners. It requires turbines to be located at least 5 rotor diameters in the prevailing wind directions and 3 rotor diameters in the non-prevailing wind direction from non-participating property lines. The standards also require internal turbine spacing of at least 5 rotor diameters in the prevailing wind directions and 3 rotor diameters in the non-prevailing wind directions. The 3x5 spacing was previously calculated using a simplified north/south 3x5 rotor diameter oval shape around each turbine.

The 3x5 rotor diameter spacing for the new layout was calculated using a geometry similar to the Red Pine Wind Project, approximately 9 miles southeast of the proposed Bitter Root Wind Project, which has a similar prevailing wind direction. The new proposed setback geometry is based on the Project's wind rose, with a prevailing wind centered at 180 degrees from north (meaning come from due south) and a second direction centered at 330 degrees from north (meaning coming from north-northwest). The proposed new setback geometry is 5 times the turbine rotor diameter length (2,231 feet; 680 meters) from 345 to 15 degrees from north and from 135 to 165 degrees from north (downwind from the predominant wind directions), and 3 times the turbine rotor diameter (1,339 feet; 408 meters) in all other wind directions. A visual representation of the new setback geometry is depicted in the new Figure 2.

f. Internal Spacing

In the Application, it is noted that turbines T3, T4, T15 and T16 had an internal spacing closer than three rotor diameters (see Section 6.1 and Figure 2 of the Application). The Application also stated that fewer than 20% of the turbine spaces will be less than 3x5 spacing, and will be subject to wake loss review and approval by the turbine manufacturer.

In the current layout, seven turbines (A5, A6, T33, T40, and T42, as well as alternate turbine A13 if built, and T9 if building alternate turbine A7) have an internal spacing closer than the 3 x 5 rotor diameter geometry. This is 16% of the total 44 turbines. For six of these turbines (A5, A6, T42, T40, T33, and A13, if built), the spacing is closer in the non-prevailing wind direction. The spacing for these turbines is at least 2.5882 rotor diameters (1,155 feet; 352 meters) rather than 3x rotor diameter (1,339 feet; 408 meters). For one turbine (T9 if building alternate turbine A7), the spacing is closer in the prevailing wind direction. The spacing for this turbine is 4.97 rotor diameters (2,218 feet; 676 meters) rather than 5 rotor diameters (2,231 feet; 680 meters). The spacing of turbines for the Project has been reviewed and approved by the turbine manufacturer (see attached letter from Vestas).

² Flying Cow Wind submitted a Notice of Addendum to Site Permit Application ("Notice") to the Commission on March 20, 2018. In that Notice, Flying Cow Wind indicated that only 2 alternate locations would be included in this Addendum, instead of the 8 alternate locations that were ultimately identified and included in this Addendum.



II. Site Permit Application Changes

Flying Cow Wind has reviewed the November 9, 2017 Application in the context of the changes to the layout. Table 1 below summarizes the Application sections that were re-evaluated for potential changes and the changes that were identified. Application sections not specifically addressed in the table below were determined not to have changed, or did not change substantively. In addition to the changes identified in Table 1 below, all figures included in the Application have been updated, and the enclosed tables (Tables 23 and 26) are also updated.

Table 1 - Site Permit Application Updates	
Section	Changes or Updates
5. Project Description and Overview	<ul style="list-style-type: none"> The V136 4.2 MW turbine is not anticipated to be available in 2019, so the Project is now proposed to consist entirely of V136 3.45 MW turbines. Change from 37 turbines plus 3 alternate locations to 44 turbines and 8 alternate locations (same Project output of up to 152 MW). The Application incorrectly stated that 21,000 acres (92%) of the Project Area was participating; 17,196 acres out of 22,888 acres (75%) are participating.
6.1 Description of Layout and Setbacks	<ul style="list-style-type: none"> Micrositing occurred as anticipated in November 2017. No change to the setback distances because the turbine dimensions have not changed. The minimum distance from a turbine to the nearest residence is 1,519 ft (463 m). This was previously 1,649 ft (503 m) in the Application. The number of turbines with reduced internal spacing was increased from four to seven (turbines noted above), which amounts to approximately 16% of the turbines. Vestas has reviewed and approved the turbine spacing for the Project. And access roads and underground collection lines were shifted accordingly with the changed turbine layout necessitated by the additional turbine locations.
6.2 Description of Turbine and Towers	<ul style="list-style-type: none"> Elimination of the V136 4.2 MW turbine from the section text and in Table 3, as noted above.
7.2 Collector Lines and Feeder Lines	<ul style="list-style-type: none"> Minor collection line shifts and reductions to the construction corridor were also made to avoid existing water pipelines, wetlands, and native grasslands, where feasible.
7.3.1 Meteorological Towers	<ul style="list-style-type: none"> One of the two proposed meteorological towers shifted approximately 160 feet northwest on the same parcel.
7.3.5 Access Roads	<ul style="list-style-type: none"> The construction disturbance for access roads is currently estimated to be up to 100 feet wide (rather than 40 feet wide), with the permanent width still 20 feet wide. Impact changes are summarized in Section 9 below. Minor access road shifts and reductions to the construction corridor were also made to avoid existing water pipelines, wetlands, and native grasslands, where feasible. Total access road length increases from approximately 11.4 miles to approximately 13.2 miles.
8. Wind Rights	<ul style="list-style-type: none"> 17,196 acres out of 22,888 acres (75%) are participating.
9.3.2 Impacts (Noise)	<ul style="list-style-type: none"> The sound assessment was updated to reflect the revised layout. All turbines are in compliance with the Minnesota noise limits. The Project is also compliant with noise limits set by Deuel County, SD for residents in SD. The highest anticipated noise level for a receptor in

	<p>MN is 48.0 dBA and in SD is 44.0 dBA; all receptors are in compliance with the noise limits in the applicable state (see attached updated sound assessment report).</p>
9.4.2 Visual Impacts on Public Resources	<ul style="list-style-type: none"> • Elimination of the V136 4.2 MW turbine as noted above. • There will be a minor incremental change in visual impacts by increasing the proposed number of turbines from 37 to 44.
9.4.3 Visual Impacts on Private Lands and Homes	<ul style="list-style-type: none"> • In a comment filed March 15, 2018, Flying Cow Wind has committed to installing an aircraft detection lighting system, pending FAA approval (see Docket WS-17-749, File No. 20183-141102-01).
9.4.5 Impacts (Shadow Flicker)	<ul style="list-style-type: none"> • The shadow flicker assessment was updated to reflect the revised layout, which has fewer impacts; see attached updated shadow flicker study report. • The maximum predicted hours of shadow flicker at a residence in one year has been reduced from 38 to 33 hours per year, and occurs at receptor MN321, a participating residence in Minnesota. • There are four residences, all in Minnesota, that are predicted to have more than 30 hours per year of shadow flicker. All are Project participants. • No receptors in South Dakota are predicted to have more than 9 hours per year of shadow flicker. The receptor in South Dakota predicted to experience the most hours of shadow flicker in one year is SD335.
9.5.1.2 Impacts (Roads)	<ul style="list-style-type: none"> • Approximately 13.2 miles of new gravel access roads are proposed (compared to 11.4 miles in the Application). • Construction disturbance for access roads is anticipated to be 100 feet, as noted above.
9.6.1 Description of Resources (Cultural and Archaeological Resources)	<ul style="list-style-type: none"> • A Phase I Archaeological Survey was conducted in October 2017 as noted in the Application. No NRHP-eligible sites were encountered. • Unsurveyed areas within the Project's construction corridor for the revised layout (18 turbines and associated roads and collection lines, totaling 511 acres) will be surveyed, the survey results compiled and submitted to MN SHPO for review, and filed with the Commission.
9.8.2.2 Impacts (Air Traffic)	<ul style="list-style-type: none"> • Flying Cow Wind has committed to installing an aircraft detection lighting system, pending FAA approval, as noted above.
9.10.1.2 Impacts (Agriculture/Farming)	<ul style="list-style-type: none"> • Approximately 82.19 acres (0.36% of the Project Area) will be permanently converted to non-agricultural land use, compared to 67.9 acres in the Application. • Approximately 49.61 acres (0.2% of the Project Area) of prime farmland will be permanently converted to non-agricultural land use, compared to 43.82 acres in the Application.
9.14.2 Impacts (Soils)	<ul style="list-style-type: none"> • Approximately 82.19 acres (0.36% of the Project Area) will be permanently converted to non-agricultural land use, compared to 67.9 acres in the Application.
9.16.1 Description of Resources (Surface Water and Floodplain Resources)	<ul style="list-style-type: none"> • Waterbody field surveys for any unsurveyed areas within the Project's construction corridor for the revised layout (18 turbines and associated roads, totaling 427 acres) will be completed and a revised report will be submitted to the Commission.
9.17.1 Description of Resources (Wetlands)	<ul style="list-style-type: none"> • Wetlands field surveys for any unsurveyed areas within the Project's construction corridor for the revised

	<p>layout will be completed and a revised report will be submitted to the Commission.</p>
9.17.2 Impacts (Wetlands)	<ul style="list-style-type: none"> • See updated Table 23 (wetland impacts; attached). • Estimated temporary wetland impacts have been reduced from 22.97 acres to 8.7 acres; estimated permanent wetland impacts have increased slightly from 0.22 acres to 0.51 acres. All permanent impacts to PSS and PFO wetlands have been eliminated. • There is no longer any disturbance within 500 feet of identified fens, compared to two locations in the Application.
9.18.2 Impacts (Vegetation)	<ul style="list-style-type: none"> • Approximately 82.19 acres (0.36% of the Project Area) will be permanently converted to non-agricultural land use, compared to 67.9 acres in the Application. • Approximately 49.61 acres (0.2% of the Project Area) of prime farmland will be permanently converted to non-agricultural land use, compared to 43.82 acres in the Application. • The proposed access road and collection line west of turbine T20 has been re-routed to avoid the larger shelterbelt of trees and a forested wetland. • Some individual trees and one small shelterbelt will be removed during construction; this is primarily the result of avoiding other constraints and keeping cropland more contiguous, at the request of landowners. • See updated Table 26 (vegetation impacts; attached) and temporary impact calculations (0.43 acres of temporary impact to MNDNR-mapped native prairie, compared to 5.75 acres in the Application).
9.19.2.1 Birds	<ul style="list-style-type: none"> • The closest distance from an eagle's nest to the nearest turbine is 1.23 miles (6.484 ft); it was 1.2 miles in the Application.
Project Construction	<ul style="list-style-type: none"> • Collection line length in the updated layout is shorter than in the Application (43.43 miles compared to 46.34 miles).



III. Conclusions

Flying Cow Wind submits that the changes outlined in this document are minor in nature. This addendum adequately captures all of the substantive changes since the November 9, 2017 Application. In addition, the modifications are being provided in time to be incorporated into the State of Minnesota permit review process, which will allow the opportunity for public and agency comment.

Please feel free to contact me with questions or concerns.

Sincerely,

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Permitting Director
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Cc: Bill Storm, Department of Commerce, Environmental Review Manager

Enclosures:

- Vestas Letter (January 23, 2018)
- All Project Figures - Revised (March 28, 2018)
- Sound Assessment - Revised (March 27, 2018)
- Shadow Flicker Assessment - Revised (March 27, 2018)
- Tables 23 and 26 - Revised (March 28, 2018)