414 Nicollet Mall
Minneapolis, MN 55401

June 18, 2019

Daniel P. Wolf **—Via Electronic Filing—**
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101

RE: AMENDED REQUEST 200 MW BLAZING STAR WIND FARM 2
WIND ENERGY PROJECT SITE PERMIT
DOCKET NO. IP-6985/WS-17-700

Dear Mr. Wolf:

Northern States Power Company, doing business as Xcel Energy (Company), requests that the Minnesota Public Utilities Commission (Commission) approve an amendment to the existing Blazing Star 2 Large Wind Energy Conversion System (LWECS) site permit originally issued to Blazing Star, LLC on November 6, 2018. The Company makes this request pursuant to Minn. R. 7854.1300, subp. 2 and Site Permit Section 13.0.

On November 6, 2018, the Commission issued a Site Permit for construction and operation of the 200 MW wind farm.

Blazing Star 2 is part of the Company's 1,550 MW wind generation portfolio that was approved by the Commission in September 2017 and is one of the four projects the Company intends to build, own and operate.

The permit amendment is requested to address (1) a new, expanded project boundary; and, (2) an updated turbine layout that incorporates Vestas V-110 and V-120 turbine generator models.

The project boundary is amended as shown in Attachment A to this application. The change is the result of additional landowner interest participation in the Project and to reduce the overlap with the Blazing Star 1 Project boundary.

The turbine model change is one of the measures taken by the Company to mitigate the economic impacts of the 2017 Tax Cuts and Jobs Act (TCJA). Specifically, the combination of V-110 and V-120 turbine generators is expected to achieve a greater capacity factor than the originally permitted layout primarily consisting of Vestas V-110 models that will result in a higher annual energy production, which in turn reduces the levelized cost of energy and mitigates the impacts of the TCJA.[1]

The changes between the previously permitted and updated layouts are due to a variety of factors, including advanced engineering since the site permit was granted, geotechnical data relative to individual turbine sites, landowner input, and environmental information gathered in the field that influenced micro-siting of turbines, and any setbacks required as a result of these turbine shifts. As is shown in the updated environmental analysis below, the updated layout helps minimize the impacts to human health and the environment and are similar to, or less than, the anticipated impact from the originally permitted layout.

The Company is submitting this proposed Site Permit Amendment after consulting with Minnesota Department of Commerce Energy Environmental Review and Analysis (EERA) staff. Below, we provide a brief background, update the Environmental Information from the November 2017 Site Permit Application based on an updated Project Area and turbine layout, then address various sections of the site permit, requesting amendments where necessary.

A. BACKGROUND

The Blazing Star 2 LWECS wind project was originally developed by Blazing Star, LLC (Geronimo Energy, LLC) in southwestern Lincoln County Minnesota. In November 2017, Geronimo Energy, LLC submitted a Site Permit Application (November 2017 Application) for the Blazing Star 2 Wind Farm (Blazing Star 2 Project). The Blazing Star 2 Project Area included in the November 17 Application was approximately 57,800 acres. Since that time, the Blazing Star 2 Project boundary has been expanded by approximately 10,000 acres to reflect additional landowner interest in participating in the Blazing Star 2 Project (Attachment A) (in total, this land is referred to herein as the 2019 Project Area). While additional land has been added to the overall Blazing Star 2 Project footprint, wind turbine facilities are sited within the project area included in the November 2017 Application; that is, wind turbine facilities are not sited on land added to the Blazing Star 2 Project since the November 2017 Application (Attachment B). A comparison of the Vestas V110 layout

[1] In a Supplement filed by the Company on May 11, 2018, in Docket No. E002/M-16-777, the Company stated that it planned to use a combination of V-110 turbines and larger V-150 turbines for Blazing Star 2. Since that time, however, the Company has decided to install V-120 turbines instead of the larger V-150 turbines. This decision is based on updated modeling conducted related to the V-150 turbines that did not show as great a savings in the levelized cost of energy as originally anticipated, and on potential additional cost and delay related to permitting from the Federal Aviation Administration for the V-150 turbines. As noted in the Supplement, the V-120 turbines also are being installed for the other projects in the 1,550 MW Portfolio.

included in the November 2017 Application to the Final V110/V120 layout is displayed on Attachment C and compliance with setbacks is demonstrated on Attachment D.

Based on the Blazing Star 2 Project boundary update and final Blazing Star 2 Project layout, Xcel Energy is providing a supplemental environmental impact analysis to the November 2017 Application. Each section of the environmental information is provided below and supplemented and/or updated, as necessary, depending on the resource. Some resources, such as demographics, would not change based on the 2019 Project Area and layout. Other sections have more detailed analysis. Additionally, all maps included in the Application have been updated to reflect the 2019 Project Area and layout as noted in Attachment E – 19 maps.

B. SUPPLEMENTAL ENVIRONMENTAL INFORMATION

8.1 Demographics

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures in the demographics section. The description in the November 2017 Application continues to apply to the expanded project area.

8.2 Land Use

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures for land use. Similar to the layouts in the November 2017 Application, all turbines in the 2019 layout are sited in either the Business and Industry District or Rural Preservation Management District. Wind energy projects are generally consistent with the uses in both zoning districts. Similarly, while there are some additional conservation easements within the 2019 Project Area (i.e., U.S. Fish and Wildlife Service [USFWS] grassland easements; based on publicly available data), these lands will not be impacted by Blazing Star 2 Project facilities.

8.3 Noise

RSG, Inc. updated the Noise Assessment for the 2019 Project Area and layout (Attachment F). The maximum calculated turbine-only noise level, based on assumptions incorporated into the Cadna-A model and the most current turbine layout, results in a 50 dBA L_{50} at the nearest noise-sensitive receptor (maximum Blazing Star 2 Project-related L_{50} range from 45 to 50 dBA; Updated Table 8.5). Average Blazing Star 2 Project-related noise levels at residences range from 39 to 45 dBA, on an hourly L_{50} basis. The highest sound level (L_{50}) at a non-participating residence is 45 dBA, and the average sound level (L_{50}) across all non-participating residences is 39 dBA.

RSG conducted background sound monitoring at six locations to record background sound levels. The average nighttime sound (L_{50}) at the four on-site monitors was 35 dBA (see Table 4 in Attachment F). Taking into account this average Project site nighttime L_{50} of 35 dBA, the average total sound levels (background + turbine) are 41 dBA for non-participating residences and 45 dBA at participating residences (Updated Table 8.5 and Table 12 in Attachment F). The maximum total noise level is 46 dBA at a non-participating residence and 50 dBA at a participating residence.

Updated Table 8.5: Summary of Noise Assessment V110/120 Layout

Residence Classification	Turbine Only Noise			Total Noise (Background + Turbine)[1]		
	Avg L_{50} Modeled	Max L_{50} Modeled	Min L_{50} Modeled	Avg L_{50} Modeled	Max L_{50} Modeled	Min L_{50} Modeled
dBA at All Residences	41	50	31	42	50	36
dBA at Participating Residences	45	50	32	45	50	37
dBA at Non-Participating Residences	39	45	31	41	46	36
[1] The average Project nighttime sound was monitored at 35 dBA (L_{50}); see Tables 4 and 12 in the June 11, 2019 Noise Report (Attachment F)						

The description of resources and mitigative measures subsections from the November 2017 Application accurately reflect the 2019 layout. Additionally, the Company has invested in serrated trailing edge (STE) blade technology for all turbines at Blazing Star 2 to further minimize noise impacts.

8.4 Visual Impacts

The 2019 Project Area and layout do not change the description of resources, visual impacts on public resources, visual impacts on private lands and homes. Impacts and mitigative measures for the 2019 layout will be similar to those represented by the Vestas V-110 layout in the November 2017 Application, which also had 100 turbine positions.

EAPC, Inc. updated the Shadow Flicker Assessment for the 2019 Project Area and layout (Attachment G). The conservative results of the shadow flicker study indicate that for the 215 receptors modeled, 13 measured more than 30 hours per year at participating landowners' occupied residences with none measuring over 25 hours and 32 minutes or more per year of realistic shadow flicker at a non-participating landowners' occupied residence (Updated Tables 8.9 and 8.10). This conservative analysis did not take credit for the blocking of trees and buildings and did not model specific facades of buildings.

Updated Table 8.9: Maximum Predicted Shadow Flicker Impacts at Participating Residences V-110/-120 Layout

Statistic[1]	Hours:minutes/year
Max - Conservative Case	185:35
Avg - Conservative Case	42:03
Max - Real Case	56:49
Avg - Real Case	13:37

[1] Statistic described as "hours:minutes"

Updated Table 8.10: Maximum Predicted Shadow Flicker Impacts at Non-Participating Residences V-110/-120 Layout

Statistic[1]	Hours:minutes/year
Max - Conservative Case	79:02
Avg - Conservative Case	12:52
Max - Real Case	25:32
Avg - Real Case	4:10

[1] Statistic described as "hours:minutes"

The mitigative measures for shadow flicker described in the 2017 Application would apply to any potential impacts for the 2019 layout.

8.5 Public Infrastructure

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures for public services and infrastructure, telecommunications, communication systems, television, or other infrastructure.

While the 2019 Project Area includes approximately 20 additional miles of roads, the Minnesota Department of Transportation (MnDOT) traffic counts listed in Table 8.12 of the 2017 Application are representative of the 2019 Project Area. Impacts and mitigative measures for roads do not differ from the 2017 Application.

8.6 Cultural and Archaeological Resources

Updated Table 8.15 below describes the eleven archaeological sites within the 2019 Project Area. The 2019 Project Area does not include any new archaeological sites when compared with the 2017 Layout. The 2019 Project Area, in fact, has two fewer archaeological sites than the 2017 Layout. Both calculations factor in the one-mile survey buffer.

Updated Table 8.15: Previously Reported Archaeological Sites within the 2019 Project Area and 1-mile Buffer

County	State Site Number	Site Name	Site Type	Cultural Affiliation	NRHP Eligibility Recommendation	Project Area/Buffer
Lincoln	21LN0017	Lipinski	Lithic Scatter	Unknown Prehistoric	Unevaluated	Project Area
Lincoln	21LN0011	Lake Shaokotan	Lithic Scatter	Unknown Prehistoric	Unevaluated	Project Area
Lincoln	21LN0014	Picnic Point County Park	Habitation	Woodland	Not Eligible	Project Area
Lincoln	21LN0015	N/A	Artifact Scatter	Unknown Prehistoric/ Historic Euro-American	Unevaluated	Project Area
Lincoln	21LN0029	Suhr	Habitation	Archaic, Woodland, Mississippian	Unevaluated	Project Area
Lincoln	21LN0037	Lyle Kragh	Single Artifact	Unknown Prehistoric	Unevaluated	Project Area
Lincoln	21LNk	N/A	Site Lead, Burial Mounds	Unknown Prehistoric	Unevaluated	Project Area
Lincoln	21LN0031	C. Crietz	Artifact Scatter	Unknown Prehistoric/ Historic Euro-American	Unevaluated	Buffer
Lincoln	21LN0038	C.C. Spanton Knoll	Lithic Workshop/ Temporary Camp	Unknown Prehistoric	Unevaluated	Buffer
Lincoln	21LN0039	Don Carey Overlook	Lithic Scatter/ Temporary Camp	Unknown Prehistoric	Unevaluated	Buffer
Lincoln	21LN0040	Bell Lake Cattle	Lithic Scatter/ Temporary Camp	Unknown Prehistoric	Unevaluated	Buffer

Updated Table 8.16 below describes the architecture resources sites within the 2019 Project Area and one-mile survey buffer. There are five fewer previously reported architecture resources sites within the 2019 Project Area and one-mile buffer compared to the 2017 Project Area and one-mile buffer. There are still six sites within the Project Area, including one new site. Five resources that were within the 2017 one-mile buffer are no longer within one mile of the Project Area, all of which are in South Dakota.

Updated Table 8.16: Previously Reported Architecture Resources within the 2019 Project Area and 1-mile Buffer

County	Architecture Inventory Number	Property Name	Property Category	NRHP Eligibility Recommendation	Project Area/Buffer
Lincoln	LN-HNT-001	Lange Homestead	Domestic	Unevaluated	Project Area
Lincoln	LN-SHK-001	farmhouse	Domestic	Unevaluated	Project Area
Lincoln	LN-SHK-002	New Grove School	Education	Unevaluated	Project Area
Lincoln	LN-SHK-003	District School No. 20	Education	Unevaluated	Project Area
Lincoln	LN-SHK-004	Shaokatan Township Hall	Government	Unevaluated	Project Area
Lincoln	LN-ALT-001	Ash Lake Township Hall	Government	Unevaluated	Project Area
Lincoln	LN-DLT-001	Church	Religion	Unevaluated	Buffer
Lincoln	LN-IVC-001	Geo Graff House	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-002	house	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-003	house	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-004	house	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-005	school	Education	Unevaluated	Buffer
Lincoln	LN-IVC-006	house	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-007	house	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-008	house	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-009	house	Domestic	Unevaluated	Buffer
Lincoln	LN-IVC-010	Ivanhoe Methodist Church	Religion	Unevaluated	Buffer
Lincoln	LN-IVC-011	bandstand	Recreation & Culture	Unevaluated	Buffer
Lincoln	LN-IVC-012	Ivanhoe Creamery	Agricultural Processing	Considered Eligible	Buffer
Lincoln	LN-IVC-013	commercial building	Commerce	Unevaluated	Buffer
Lincoln	LN-IVC-014	commercial building	Commerce	Unevaluated	Buffer
Lincoln	LN-IVC-015	Funeral Home	Funerary	Unevaluated	Buffer
Lincoln	LN-IVC-016	Lincoln County Courthouse and Jail	Government	NRHP Listed	Buffer
Lincoln	LN-MRB-001	Marble Lutheran Church	Religion	Unevaluated	Buffer
Lincoln	LN-MRB-002	Marble Township Hall	Government	Unevaluated	Buffer
Lincoln	LN-ROY-001	St. John Cantius Catholic Church	Religion	Unevaluated	Buffer
Lincoln	LN-SHK-005	Thompsonburg	Landscape	Unevaluated	Buffer
Brookings	BK00001058	farmstead	Domestic	Unevaluated	Buffer

Updated Table 8.16: Previously Reported Architecture Resources within the 2019 Project Area and 1-mile Buffer

County	Architecture Inventory Number	Property Name	Property Category	NRHP Eligibility Recommendation	Project Area/Buffer
Brookings	BK00001244	house	Domestic	Not Eligible	Buffer
Brookings	BK00001249	house	Domestic	Not Eligible	Buffer
Brookings	BK00001251	Hexem Farmstead	Domestic	Considered Eligible	Buffer
Brookings	BK00001269	house	Domestic	Not Eligible	Buffer
Brookings	BK00001339	house	Domestic	Not Eligible	Buffer
Brookings	BK00001350	farmstead	Domestic	Not Eligible	Buffer
Brookings	BK00001372	house	Domestic	Not Eligible	Buffer
Brookings	BK05000001	farmstead	Domestic	Not Eligible	Buffer
Brookings	BK05100001	house	Domestic	Not Eligible	Buffer

The impacts and mitigative measures described in the November 2017 Application continue to apply. Xcel Energy is conducting Phase 1a archaeological resources inventory for the final layout and coordinating with the State Historic Preservation Office and Office of State Archaeologist. This work will be completed before construction begins.

8.7 Recreation

The recreation lands described in the November 2017 Application are generally the same. The expansion of the Project boundary in 2019 includes several recreation lands that were previously adjacent to the 2017 boundary: Prairie Dell Wildlife Management Area (WMA), additional parcels of Chain-O-Sloughs WMA, Spanton WMA, Suhr WMA, Weeks WMA, a Walk-In Area (WIA)for hunting, and two unnamed Waterfowl Production Area (WPA) parcels. Snowmobile trails still bisect the Project Area along MN-19 and US-75.

The impacts and mitigative measures described in the November 2017 Application are consistent with the 2019 layout. Turbines are sited at least 3 rotor diameters by 5 rotor diameters away from WMAs and WPAs and no other Project facilities are sited on these lands. Additionally, the Project layout avoids impacts to WIAs, which are private lands open to hunting. As noted in the November 2017 Application, Xcel Energy will coordinate with the Lincoln County Drift Clipper snowmobile club for potential impacts to the trail.

8.8 Public Health and Safety

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures for public health and safety. Xcel Energy will file the final turbine locations for approval with the Federal Aviation Administration. Additionally, Xcel Energy will implement an Aircraft Lighting Detection System (ALDS) at Blazing Star 2.

8.9 Hazardous Materials

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures for hazardous materials. Xcel Energy is conducting a Phase 1 Environmental Site Assessment at the Project.

8.10 Land-based Economies

Similar to the 2017 Project Area, the majority of the 2019 Project Area is in agricultural use. Cultivated land comprises approximately 41,965 acres (63 percent) of the 2019 Project Area. Pasture/hay lands comprise approximately 7,618 acres (11 percent) of the 2019 Project Area. Approximately 46 percent of the soil within the 2019 Project Area is classified as prime farmland.

The 2019 layout will permanently impact 77.5 acres of agricultural land (cultivated crops and hay/pasture), which is slightly less than the 2017 layout for the Vestas V-110 (92 acres; Updated Table 8.20). The 2019 layout will impact approximately 85.4 acres of prime farmland, most of which is for access roads. The mitigative measures described in the November 2017 Application also apply to the 2019 layout.

Updated Table 8.20: Summary of Prime Farmland Impacts (2019 Layout)

	All Areas Prime Farmland		Prime Farmland if Drained		Farmland of Statewide Importance		Not Prime Farmland		Total Acres Impacted
	# Turbines	Acres	# Turbines	Acres	# Turbines	Acres	# Turbines	Acres	
Turbines	62	16.0	21	5.2	17	4.0	2	0.6	**26.0**
Access Roads	-	32.3	-	14.6	-	4.8	-	0.7	**52.2**
Project Substation	-	5.6	-	1.4	-	-	-	-	**7.0**
Total	**62**	**53.9**	**21**	**21.3**	**17**	**8.8**	**2**	**1.4**	**85.4**

The 2019 Project Area and layout do no change the description of resources, impacts, or mitigative measures for forestry or mining.

8.11 Tourism

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures for tourism.

8.12 Local Economies

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures for local economies.

8.13 Topography

The 2019 Project Area and layout do not change the description of resources, impacts, or mitigative measures for topography.

8.14 Soils

There are no new types of soils in the 2019 Project Area, when compared to the 2017 Project Area. However, because the 2019 Project Area is larger than the 2017 Project Area, Table 8.22 has been updated to reflect that additional acreage.

Updated Table 8.22: Soil Associations in 2019 Project Area

Soil Association	Area (acres)
Flom-Barnes (s3542)	41,779
Singsaas-Flom (s3543)	20,883
Langhei-Hamerly-Barnes (s3467)	3,654
Forman-Buse-Aastad (s6894)	504
Vienna-Kranzburg-Hidewood (s3545)	188
Total	**67,008**

The impacts and mitigative measures described in the 2017 Application apply to the 2019 layout.

8.15 Geologic and Groundwater Resources

The surficial and bedrock geology description of resources, impacts, and mitigative measures described in the November 2017 Application are consistent with the 2019 Project Area and layout.

There are 57 located wells and an additional 31 unverified well locations within the 2019 Project Area, an increase of 15 and 8 wells in each category within the 2017 Project Area. The impacts and mitigative measures for aquifers and wells are the same for the 2019 Project Area and layout.

8.16 Surface Water and Floodplain Resources

The 2019 Project Area has three additional Public Waters Inventory (PWI) wetlands and two PWI basins (Prairie Dell and Oak). Lake Shakotan was previously only partially within the 2017 Project Area and is fully within the 2019 Project Area. Additionally, one unnamed PWI basin is no longer in the Project Area compared to 2017. The 2019 Project Area has the same PWI watercourses as the 2017 Project Area, just longer stretches of most. Similarly, there are no additional impaired waters in the 2019 Project Area. Because no wind farm facilities are being placed in the expanded project area, the impacts and mitigative measures for Public Waters and impaired waters are consistent with the 2017 Application.

The description of resources, impacts, and mitigative measures for Wildlife Lakes, Migratory Waterfowl Feeding and Resting Lakes, and Federal Emergency Management Agency Floodplains is consistent with the 2017 Application.

8.17 Wetlands

The 2019 Project Area has approximately 2,000 additional acres of National Wetland Inventory (NWI) mapped wetlands (updated Table 8.24). The majority of the additional wetlands are palustrine emergent and freshwater pond/lake.

Updated Table 8.24: National Wetlands Inventory in the 2019 Project Area

NWI Type		NWI Acreage
Palustrine Emergent Wetland (PEM)	PEM1A	2,238.3
	PEM1Ad	2.4
	PEM1Af	1,262.3
	PEM1Ah	41.7
	PEM1Ax	0.4
	PEM1B	1221.2
	PEM1Bh	0.7
	PEM1C	1,331.4
	PEM1Cd	0.7
	PEM1Ch	102.5
	PEM1Cx	4.3
	PEM1F	887.0
	PEM1Fh	23.6
	PEM1Fx	5.0

Updated Table 8.24: National Wetlands Inventory in the 2019 Project Area

NWI Type		NWI Acreage
	Sub Total	**7,121.6**
Palustrine Scrub-shrub Wetland (PSS)	PSS1A	16.0
	PSS1B	9.3
	PSS1C	28.2
	Sub Total	**53.5**
Palustrine Forested Wetland (PFO)	PFO1A	83.5
	PFO1Ah	0.4
	PFO1Ax	0.4
	PFO1B	27.1
	PFO1C	29.1
	Sub Total	**140.6**
Freshwater Pond/Lake	PABF	8.5
	PABFx	0.8
	PABH	6.5
	PUBF	69.0
	PUBFh	12.0
	PUBFx	26.4
	PUBH	164.3
	PUBHh	15.6
	PUBKx	5.3
	L1UBH	930.3
	L2ABH	129.7
	L2UBH	1,090.1
	Sub Total	**2,458.5**
Wetland Total		**9,774.2**

Wetland acreage is calculated using Minnesota's Update to NWI data

Based on NWI-mapped wetlands, the 2019 layout would impact 1.2 acres of PEM wetlands, slightly less than the 1.5 acres in the November 2017 Application. These impacts are associated with one turbine pad and 11 access roads.

Updated Table 8.25: Summary of Wetland Impacts based on NWI

Project Feature	PEM	
	# Turbines	Acres
Turbines	1	0.2
Access Roads	NA	1.0
Project Substation	NA	-
Total	**1**	**1.2**

[1] *There are no PFO, PSS, or freshwater pond/lake NWI mapped wetlands that will be impacted by the Project.*

As discussed in the November 2017 Application, potential impacts to NWI-mapped wetlands will be field verified by wetland delineations. These field surveys will provide more accurate boundaries of the desktop NWI data, and/or confirm absence of mapped wetlands or presence of unmapped wetlands. Since 2017, Xcel Energy has refined the layout to minimize impacts to wetlands incorporating the delineation data to date. Xcel Energy is coordinating with the U.S. Army Corps of Engineers and the Local Government Unit on the wetland delineation methodology and to permit wetland impacts.

8.18 Vegetation

Land cover types in the 2019 Project Area are proportionately similar to the 2017 Project Area (Updated Table 8.26). Similar to the 2017 Project Area, cultivated crops comprise nearly two-thirds of the 2019 Project Area.

Updated Table 8.26: Land Cover Types and their Relative Abundance in the 2019 Project Area

Land Cover	Acres	Percent of Project Area
Cultivated Crops	41,964.9	62.6%
Grassland/Herbaceous	8,424.1	12.6%
Hay/Pasture	7,617.9	11.4%
Developed, Open Space	3,330.7	4.8%
Emergent Herbaceous Wetlands	2,787.7	4.2%
Open Water	2,429.0	3.6%
Deciduous Forest	371.7	0.6%
Developed, Low Intensity	86.3	0.1%
Barren Land	47.3	0.1%
Woody Wetlands	33.6	0.1%
Developed, Medium Intensity	20.8	<0.1%

Updated Table 8.26: Land Cover Types and their Relative Abundance in the 2019 Project Area

Land Cover	Acres	Percent of Project Area
Shrub/Scrub	5.6	<0.1%
Developed, High Intensity	2.4	<0.1%
Total	**67,012.0**	**100.0%**

Similar to land cover, the 2019 Project Area has proportionately more Minnesota Department of Natural Resources (MN DNR) mapped native prairie and native plant communities. There are approximately 90 acres of additional MN DNR mapped native prairie and 20 additional acres of MN DNR mapped native plant communities (Updated Table 8.27).

Updated Table 8.27: Native Prairie and Native Plant Community Types within the 2019 Project Area

Source	Native Plant Community Type	Acres in Project Area
MN DNR Native Prairie	Dry hill prairie (southern)	434.2
	Dry sand – gravel prairie (southern)	55.0
	Mesic prairie (southern)	5.3
	Wet prairie (southern)	2.4
	Subtotal	**496.8**
MN DNR Native Plant Community	Basswood – bur oak – (green ash) forest	17.3
	Prairie meadow/carr	53.9
	Spikerush – bur reed marsh (prairie)	0.9
	Subtotal	**72.1**
Total		**568.9**

The 2019 Project Area includes four additional Sites of Biodiversity Significance (SOBS) below the threshold and five additional sites of moderate biodiversity significance. These additional sites total an additional 1,956 acres of SOBS in the Project Area compared to 2017 (Updated Table 8.28).

Updated Table 8.28: Sites of Biodiversity Significance within the 2019 Project Area

Site of Biodiversity Significance	Number of Sites Within Project Area	Acres
Below	59	6,313
Moderate	29	4,399
High	0	0
Outstanding	0	0

The 2019 layout will permanently impact 85.4 acres of land with turbines, access roads, and the Blazing Star 2 Project substation (Updated Table 8.29). While the 2019 layout has fewer permanent impacts overall (85.4 acres compared to 92 in the 2017 layout), proportionately, the impacts are similar. Most of the permanent impacts (88 percent) are to cultivated crops.

Updated Table 8.29: Summary of Estimated Permanent Impacts to Vegetation (Acres)

	Turbines	Access Roads	Project Substation	Total
Cultivated Crops	23.4	45.5	6.4	**75.4**
Grassland/Herbaceous	1.5	2.3	-	**3.8**
Hay/Pasture	0.6	1.5	-	**2.1**
Emergent Herbaceous Wetlands	0.4	1.1	-	**1.5**
Developed, Open Space	-	2.0	0.6	**2.6**
Total	**26.0**	**52.4**	**7.0**	**85.4**

The 2019 layout avoids permanent impacts to MN DNR-mapped native prairie, native plant communities, and sites of moderate biodiversity significance. There are three locations where collection lines and/or crane paths will cross MN DNR-mapped native prairie and the associated overlapping site of biodiversity significance. Xcel Energy is coordinating with the MN DNR on a Native Prairie Protection and Management Plan, which will address avoidance, minimization, and mitigation measures for native prairie, native plant communities, and sites of biodiversity significance. The other mitigative measures described in the 2017 Application apply to the 2019 layout.

8.19 Wildlife

The characterization of wildlife that may utilize the 2019 Project Area would be similar to what is described in the 2017 Application. Tier 3 studies that were in progress during the 2017 Application have been completed and are incorporated into the draft Avian and Bat

Protection Plan (ABPP), which has also been reviewed by the MN DNR. Impacts and mitigative measures described in the 2017 Application apply to the 2019 layout.

8.20 Rare and Unique Resources

The description of resources, impacts, and mitigative measures described in the 2017 Application also apply to the 2019 Project Area and layout. There are no additional MN DNR Natural Heritage Information System (NHIS) records in the 2019 Project Area. In some cases, those records outside the 2017 Project Area but within five miles of it are now closer to the 2019 Project Area.

C. SITE PERMIT AMENDMENTS

On April 18, 2019, the Company provided the DNR with a current project layout for the Blazing Star 2 Wind Farm. The Company respectfully requests that the Commission amend the November 6, 2018 Site Permit as described below.

SECTION 2.0 - PROJECT DESCRIPTION

The Site Permit currently reads as follows:

> *The Blazing Star Wind Farm* 2 *will be up to 200 MW LWECS, consisting of 67 to 100 wind turbines ranging in size from 2 to 3 MW. The LWECS will consist solely of one turbine model, or a combination of turbine models, selected from the following: Gamesa G126 (2.625 MW), GE 2.5-116 (2.5 MW), Vestas 110 (2.0 MW), and Acciona 3.0-132 (3.0 MW), as identified in the Permittee's Site Permit Application.*

The Company requests an amendment to this section as follows:

> *The Blazing Star Wind Farm will be a 200 MW nameplate capacity LWECS. The LWECS will consist of 10 Vestas V-110 and 90 Vestas V-120 turbines. Both turbine models are 2 MW in size.*

As noted above, the turbine change is one of the measures taken by the Company to mitigate the economic impacts of the 2017 Tax Cuts and Jobs Act (TCJA), and the combination of V-110 and V-120 turbine generators is expected to achieve a greater capacity factor than the 2017 layout of mostly V-110 turbine generators.

The turbine towers will be conical tubular steel with a hub height of up to 262 feet. The V-120 turbines will measure 459 feet from the base of the tower to the tip of the upright blade with a rotor diameter of 394 feet. The portion of the foundation

that is above ground is 18 feet wide at the base of the tower. A transformer inside the V-110 and V-120 turbines will be used to step up the voltage to 34.5 kV.

SECTION 3.1 - TURBINE LAYOUT

The Site Permit currently references official site maps attached to the permit. These maps show wind turbine and associated facility layouts for Gamesa G126, Acciona 3.0-132, GE 2.5-116, and Vestas V-110 turbines. We provide as Attachment B to this request, a map showing the final project boundary and turbine layout with Vestas V-110 and V-120 turbines. The Company requests approval to amend the permit with the site maps with those provided in Attachment B.

We note that the text within this section of the Site Permit continues to be accurate as written and request no change to the text.

SECTION 4.1 - WIND ACCESS BUFFER

The Site Permit states:

> *Wind turbine towers shall not be placed less than five rotor diameters on the prevailing wind directions and three rotor diameters on the non-prevailing wind directions from the perimeter of the property where the Permittee does not hold the wind rights, without the approval of the Commission. This section does not apply to public roads and trails.*

The Company confirms the updated facility layout complies with this requirement. The Figure in Attachment D illustrates the required wind access buffer. The project boundary has changed to incorporate additional easements. A project boundary comparison is provided in Attachment A.

SECTION 4.2 - RESIDENCES

The Site Permit states:

> *Wind turbine towers shall not be located closer than 1,000 feet from all residences or the distance required to comply with the noise standards pursuant to Minn. R. 7030.0040, established by the Minnesota Pollution Control Agency, whichever is greater.*

We confirm that the updated facility layout complies with this requirement. The Figure in Attachment D illustrates the setbacks from residences and other features that were applied to the facility layout. The closest turbine to a residence is Turbine 147, which is 1,070 feet from the nearest residence. The nearest non-participating residence is located 1,677 feet from Turbine 104, the nearest turbine. An updated noise assessment for the current layout

is included as Attachment F to this application. Please see Section 4.3 below for further details.

SECTION 4.3 – NOISE

The Site Permit states:

> *The wind turbine towers shall be placed such that the Permittee shall, at all times, comply with the noise standards established by the Minnesota Pollution Control Agency as of the date of this permit and at all appropriate locations. The noise standards are found in Minnesota Rules Chapter 7030. Turbine operation shall be modified or turbines shall be removed from service if necessary to comply with these noise standards. The Permittee or its contractor may install and operate turbines as close as the minimum setback required in this permit, but in all cases shall comply with Minnesota Pollution Control Agency noise standards. The Permittee shall be required to comply with this condition with respect to all homes or other receptors in place as of the time of construction, but not with respect to such receptors built after construction of the towers.*

As evidenced by the updated noise assessment for the Vestas V-110/-120 layout provided in Attachment F, and the updated Table 8.5 above, the total projected sound levels from the project as currently designed are expected to be below both the state nighttime limit of 50 dBA (L50) and the daytime limit of 60 dBA (L50).

SECTION 4.9 - WIND TURBINE TOWERS

The Site Permit states:

> *Structures for wind turbines shall be self-supporting tubular towers. The towers may be up to 150 meters (492 feet) above grade measured at hub height.*

We confirm that no amendment is needed to this section of the Site Permit. The Vestas V-110 and V-120 turbines are self-supporting turbine towers of conical tubular steel and will have a hub height of up to 80 meters (262 feet).

SECTION 5.2.26 - TOWER IDENTIFICATION

The Site Permit states:

> *all turbine towers shall be marked with a visible identification marker.*

We provide as Attachment C, a figure illustrating the difference between the previously permitted V-110 turbine locations and numbering and the current Vestas V-110/V-120

layout. We additionally provide as Attachment H, a table summarizing the change in turbine locations and numbering. Signage will be present at each turbine location indicating the turbine number and facility ownership. The Company has renumbered the turbine layout from the permitted layouts in order to maintain consistency in turbine numbering schemes between our wind farms.

SECTION 5.4 - ELECTRICAL COLLECTOR AND FEEDER LINES

The Site Permit states:

> *Collector lines that carry electrical power from each individual transformer associated with a wind turbine to an internal project interconnection point shall be buried underground. Collector lines shall be placed within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner.*
>
> *Feeder lines that carry power from an internal project interconnection point to the project substation or interconnection point on the electrical grid may be overhead or underground.*
>
> *Feeder line locations shall be negotiated with the affected landowner. Any overhead or underground feeder lines that parallel public roads shall be placed within the public rights-of-way or on private land immediately adjacent to public roads. If overhead feeder lines are located within public rights-of-way, the Permittee shall obtain approval from the governmental unit responsible for the affected right-of-way.*
>
> *Collector and feeder line locations shall be located in such a manner as to minimize interference with agricultural operations including, but not limited, to existing drainage patterns, drain tile, future tiling plans, and ditches. Safety shields shall be placed on all guy wires associated with overhead feeder lines. The Permittee shall submit the engineering drawings of all collector and feeder lines in the site plan pursuant to Section 10.3.*

We provide as Attachment B, an amended map of the project facilities, including collector and feeder lines. The Site Permit provides general specifications for collector and feeder line installation. Similar to many other wind farm construction projects, design of this project's electrical collection system has evolved, and continues to be refined, with project development and completion of environmental studies. Per the updates to Section 8 of the Site Permit Application above, impacts to human health and the environment are being minimized to the extent practicable and will be similar to or less than impacts anticipated from the original permitted designs. Projected impacts are primarily temporary and are related to wetlands, native prairie, agriculture, soils, and other resources addressed in the site permit application. The Company will submit the engineering drawings of all collector and feeder lines in the site plan pursuant to Section 10.3 of the Site Permit.

SECTION 7.1 - BIOLOGICAL AND NATURAL RESOURCE INVENTORIES

The Site Permit states:

> *The Permittee, in consultation with the Commission and the Department of Natural Resources, shall design and conduct pre-construction desktop and field inventories of existing wildlife management areas, scientific and natural areas, recreation areas, native prairies and forests, wetlands, and any other biologically sensitive areas within the project site and assess the presence of state- or federally-listed or threatened species. The results of the inventories shall be filed with the Commission at least 30 days prior to the pre-construction meeting to confirm compliance of conditions in this permit. The Permittee shall file with the Commission, any biological surveys or studies conducted on this project, including those not required under this permit.*

The survey reports included with the site permit application, dated November 15, 2017, are still accurate for the project. Although the project boundary has changed to incorporate additional easements, no project infrastructure will be constructed on the newly acquired easements. Therefore, no inventories will be conducted on the newly acquired easements. In accordance with Permit Section 7.1, biological desktop and field inventories will be filed at least 30 days prior to the pre-construction meeting per the Site Permit.

SECTION 7.2 - SHADOW FLICKER

The Site Permit requires:

> *for each residence of non-participating and participating landowners within and outside of the project boundary potentially subject to turbine shadow flicker exposure.*

We provide as Attachment G, an updated Shadow Flicker modeling report reflecting the current turbine layout. Modeling results show the estimated highest shadow flicker for a non-participant is 24 hours per year; and the estimated highest shadow flicker for a participant is 30 hours per year. However, it should be noted that the study used conservative assumptions (*e.g.*, no blocking from trees or buildings) and the actual number of hours of shadow flicker that would be observed will be less than those predicted by this study.

SECTION 7.5.1 - AVIAN AND BAT PROTECTION PLAN

The Site Permit requires:

> *Operational Phase Fatality Monitoring*
> *The Permittee shall utilize a qualified third party to conduct a minimum of two full years of avian and bat fatality monitoring following the commencement of the operational phase of the project. Monitoring activities and results will be coordinated directly with MN DNR, USFWS, and the Commission. Detailed monitoring protocols, agency coordination, and any avoidance and minimization measures will be detailed in the project's ABPP.*

The Company will provide an amended turbine layout map in the revised Avian and Bat Protection Plan (ABPP) that will be filed 14 days prior to the pre-construction meeting. The revised ABPP will include a discussion of potential impacts to birds and bats and will also include additional wildlife studies that have been completed since the site permit application was filed. The Company will be coordinating with the DNR in mid-2019 to finalize the updated ABPP, as well as the updated NPPP, which will be filed 30 days prior to the site plan filing per Section 4.7 of the Site Permit.

SECTION 10.3 - SITE PLAN

At least 14 days prior to the pre-construction meeting, the Company will submit a full project site plan and engineering drawings to the Commission, EERA and the Lincoln County Environment Office. We provide as Attachment A, a figure that provides the current layout which includes all the facilities. Attachment E is a figure that provides a comparison between the previously permitted Vestas V-110 layout and the current Vestas V-110/V-120 layout. The changes between the previously permitted and updated layouts are due to a variety of factors, including advanced engineering since the site permit was granted, geotechnical data relative to individual turbine sites, landowner input, and environmental information gathered in the field that influenced micro-siting of turbines, and any setbacks required as a result of these turbine shifts. The updated layout helps minimize the impacts to human health and the environment and are similar to, or less than, the anticipated impact from the originally permitted layouts. Attachment F is a table summarizing the changes to the turbine locations and provides additional details regarding the changes, such as turbine moves to avoid wetland impacts.

CONCLUSION

For the reasons stated above, the Company respectfully requests the Commission approve our Request for Amendment in the Blazing Star 2 LWCES wind project Site Permit. The Company agrees to abide by all the terms and conditions of the currently approved Site Permit, as modified by the above-requested amendments.

We have electronically filed this document with the Minnesota Public Utilities Commission, and copies have been served on the parties on the attached service list. Please contact Bria Shea at bria.e.shea@xcelenergy.com or (612) 330-6064 or Pamela Gibbs at pamela.k.gibbs@xcelenergy.com or (612) 330-2889 if you have any questions regarding this filing.

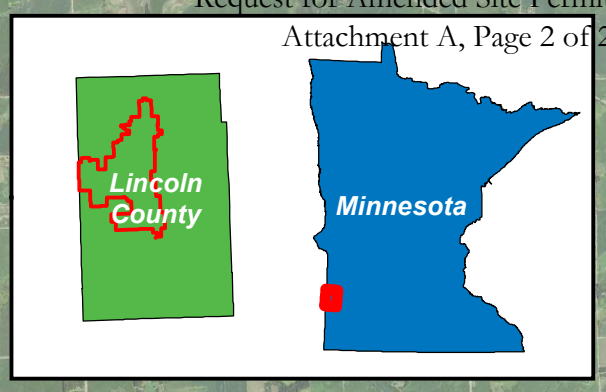
Sincerely,

/s/

BRIA E. SHEA
DIRECTOR, REGULATORY AND STRATEGIC ANALYSIS

CC: MATTHEW LANGAN
JEFF BERRINGTON

Attachment A – Project Boundary Comparison



BLAZING STAR 2 WIND FARM
Lincoln County, MN

0 0.75 1.5 3
Miles

Imagery Source: 2015 Color FSA
Data Source: Geronimo Energy, MN DNR, USFWS

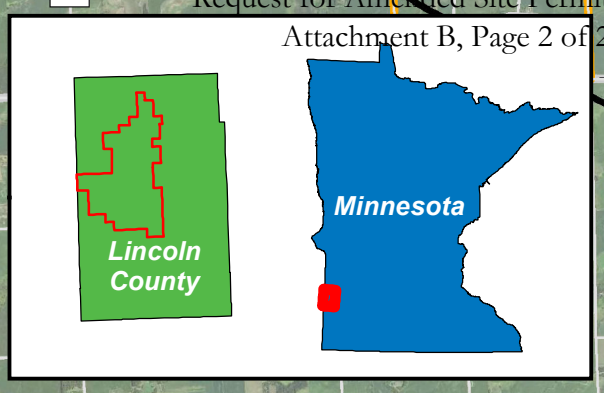
Project Boundary Comparison
Vestas V110/V120

Blazing Star Wind Farm 2
Lincoln County, MN

44.460125, -96.336861

Project Area Boundary
Permitted Boundary (November 2017)

Attachment B – 2019 Layout



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Lake Oak
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Lake Perch
Lake Hendricks
Lake Anderson
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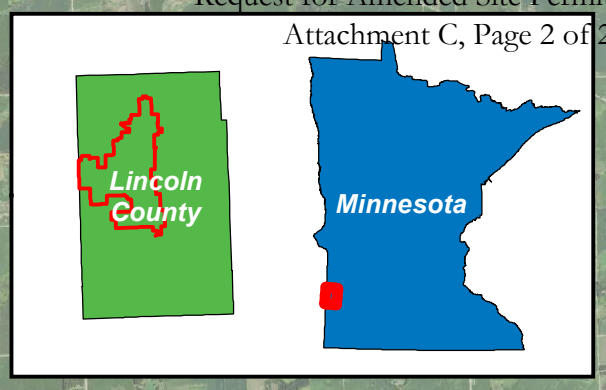
BLAZING STAR 2
WIND FARM
Lincoln County, MN
0 0.75 1.5 3
Miles
Imagery Source: 2015 Color FSA
Data Source: Geronimo Energy, MN DNR, USFWS
Project Layout
Vestas V110/V120
Blazing Star Wind Farm 2
Lincoln County, MN
44.460125, -96.336861
Turbine Location
Alternate Turbine Location
Project Area Boundary
Project Substation
Access Road
Collection Line
Crane Path
County Boundary
*Turbines are not to scale
Document Path: Z:\Clients\E_H\Geronimo\Blazing_Star_II\Permitting\State\PUC_Site_Permit\Mapping\Update_V110_V120\Figure_V110_V120_Project_Layout.mxd
bkschreurs Date: 4/18/2019

Attachment C – 2017 and 2019 Layout Comparison



BLAZING STAR 2 WIND FARM
Lincoln County, MN

0 0.75 1.5 3
Miles

Imagery Source: 2015 Color FSA
Data Source: Geronimo Energy, MN DNR, USFWS

Turbine Layout Comparison
Vestas V110/V120

Blazing Star Wind Farm 2
Lincoln County, MN

44.460125, -96.336861

Permitted Turbine Layout (November 2017)

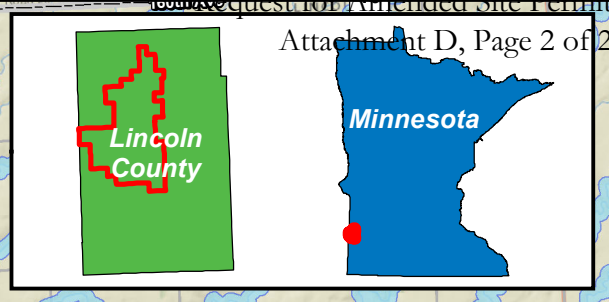
April 2019 Turbine Layout

Turbine Location

Alternate Turbine Location

Project Area Boundary

Attachment D – 2019 Project Setbacks



Wind access buffers overlap project boundary to participating land

Turbine Layout and Constraints
Vestas V110/V120

Blazing Star Wind Farm 2
Lincoln County, MN

44.460125, -96.336861

BLAZING STAR 2 WIND FARM
Lincoln County, MN

0 0.75 1.5 3
Miles

Imagery Source: National Geographic World Map
Data Source: Geronimo Energy, MN DNR, Census, Lincoln Co.

- Turbine Location
- Alternate Turbine Location
- Permanent Met Tower
- Residential Structures within 1 Mile (excluding cities of Hendricks and Ivanhoe)
- Project Area Boundary
- Wind Access Buffer
- Setbacks
- Shoreland Management District
- Participants within 1 Mile
- Existing Substation
- Existing Transmission Line
- MVP 345kV Transmission Line
- Existing Pipeline
- Snowmobile Trail

*** Turbines are not to scale**

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bkschreurs Date: 4/18/2019