

Appendix C

Turbine A06 Analysis of Incremental Environmental Impacts

TURBINE A06 ANALYSIS OF INCREMENTAL ENVIRONMENTAL IMPACTS

As described in Section 4.1 of the Supplemental and Amended Site Permit Application (Amended Application), Big Bend includes 52 turbine positions in the Amended Application and one additional alternative turbine, Turbine A06, detailed in this Appendix C. Based on coordination with the Air National Guard and U.S. Air Force, there is a military training route near the eastern edge of the Project Area. As such, Big Bend previously removed the eastern most-turbine from the proposed layout (formerly Turbine 37, also known as Turbine A06) to mitigate military airspace concerns. While Big Bend has coordinated independently with the U.S. Department of Defense (DoD) (see attached letter from DoD on this flight path related to Turbine A06, formerly T37), as part of the Settlement Agreement, the Parties agree to jointly and in good faith coordinate with DoD to gain concurrence that a wind turbine could be sited in the approximate location of A06 (formerly Turbine 37). The Parties commenced that coordination in September 2021. Because this turbine position is dependent on DoD concurrence, Big Bend provides a separate analysis of environmental impacts below.

If constructed, Turbine A06 would permanently impact 0.9 acre, including the turbine pad and permanent access road, all of which would be within cultivated cropland. Temporary impacts would total 41.5 acres; 98 percent of the temporary impacts would affect cultivated cropland and two percent would affect developed land. Temporary impacts would be associated with crane walkways, the installation of underground collection lines, workspace around turbines, and a wider access road for use by construction vehicles and equipment. Table 1 presents a summary of permanent and temporary environmental impacts associated with Turbine A06. Figures depicting Turbine A06 are provided below.

Table 1 Environmental Analysis of Turbine A06		
Environmental Features	Permanent	Temporary
General		
Turbine (acres)	0.2	2.7
Access Road (acres)	0.7	5.7
Crane Path (acres)	--	12.4
Collection Line (acres)	--	20.7
Proximity to Residences		
Nearest Participating Residence (feet)	1,304	
Nearest Non-Participant Residence (feet)	3,160	
Proximity to Communication Systems		
Nearest Communication Tower (feet)	10,507	
Nearest Land Mobile Communication Antenna (feet)	3,406	
Prime Farmland		
Total All Categories of Prime Farmland (acres)	0.9	40.6
Farmland of State Importance (acres)	--	0.9
Land Cover (2016 National Land Cover Data, Yang et al., 2018)		
Cultivated Crop Land (acres)	0.9	40.6

Table 1 Environmental Analysis of Turbine A06		
Environmental Features	Permanent	Temporary
Developed Areas (acres)		0.9
Wetlands (Minnesota's Update to National Wetland Inventory)		
Palustrine Emergent Wetland (acres)	--	0.2
Riverine (acres)	--	0.1
FEMA-designated Flood Zones		
Total FEMA-designated 100-year floodplains (acres)	--	1.3

Turbine A06 would be sited within the Agricultural District in Watonwan County. The nearest participating residence to Turbine A06 is 1,304 feet to the north and the nearest non-participating residence is 3,160 feet to the east/southeast. The nearest airport is the St. James Municipal Airport, which is 8.3 miles east of Turbine A06.

Noise and shadow flicker modeling included Turbine A06. Table 2 below summarizes modeled noise and shadow flicker for each of the three proposed turbine models at the closest participating and non-participating residences identified above.

Table 2 Modeled Noise and Shadow Flicker at Residences near Turbine A06						
	Turbine-Only Noise, L₅₀ (dBA)			Shadow Flicker (hr/yr)		
	N-163	V162	GE-158	N-163	V162	GE-158
Closest Participating Residence (ID-16)	43	45	45	22:12	21:58	19:23
Closest Non-Participating Residence (ID-614)	35	36	37	12:50	12:47	12:02

The co-located collection lines and crane path to Turbine A06 would cross the Riverside Trail where the snowmobile trail is co-located with County Road 5, north of the Town of Butterfield. No additional designated recreation areas or trails would be affected by construction or operation of Turbine A06.

No permanent wetland impacts would occur from construction of Turbine A06. Based on review of the NWI data, temporary impacts on wetlands may occur from the use of crane paths and installation of collection lines during construction of Turbine A06. None of the wetlands that would be temporarily impacted during construction are MNDNR-designated PWI wetlands. Temporary impacts associated with the use of crane paths will be minimized by the use of matting during construction. Installation of underground utilities is expected to minimize impacts to wetlands or where possible make them coincident with other impacts (e.g., crane paths).

Construction of Turbine A06 would not permanently impact FEMA-designated floodplains, though crane paths and collection lines would cross FEMA-designated 100-year floodplain area in Watonwan County (FEMA, 1985). These impacts are expected to be minimal and would only occur during construction.

Turbine A06 would not affect conservation easements, previously recorded cultural resources, surface waters, native prairie areas, native plant communities or Sites of Biodiversity Significance. Big Bend also does not anticipate any impacts to communication systems, including radio, television, cellular towers, or broadband services if Turbine A06 is constructed. Incremental

effects on public services and infrastructure and local transportation are not anticipated if Turbine A06 is constructed.

References:

- Federal Emergency Management Agency (FEMA). 1985. FIRM panel 270649A – Unincorporated areas of Watonwan County. Available online at: <https://msc.fema.gov/portal/advanceSearch#searchresultsanchor>. Accessed August 2020.
- Yang, L., Jin, S., Danielson, P., Homer, C., Gass, L., Case, A., Costello, C., Dewitz, J., Fry, J., Funk, M., Grannemann, B., Rigge, M. and G. Xian. 2018. A New Generation of the United States National Land Cover Database: Requirements, Research Priorities, Design, and Implementation Strategies, ISPRS Journal of Photogrammetry and Remote Sensing, 146, pp.108-123



DEPARTMENT OF THE AIR FORCE

WASHINGTON, DC 20330-1000

OFFICE OF THE ASSISTANT SECRETARY

FROM: SAF/IEIM
1665 Air Force Pentagon
Washington DC 20330-1665

SUBJECT: Big Bend Wind Project (2020-WTE-4685-OE) near Mountain Lake, Minnesota

Dear Mr. Dylan Ikkala,

At your request, the Office of the Air Force Director, Community Partnership and Encroachment Management, hereby provides this letter to document the results of the discussions for Apex Clean Energy's proposed Big Bend Wind Project in Mountain Lake, Minnesota. In June 2019, the 133rd Airlift Wing (AW) of the Minnesota Air National Guard (ANG) requested an informal consult for the proposed Big Bend Wind Project. The 133rd AW and ANG coordinated with the proponent, DARE Strategies, and concurred with the proposed wind turbines with the provision that all obstruction lighting must be night vision goggle compatible. The 133rd AW also noted that any further expansion eastward into the lateral boundaries of SR- 728 should be coordinated with the 133rd AW in advance.

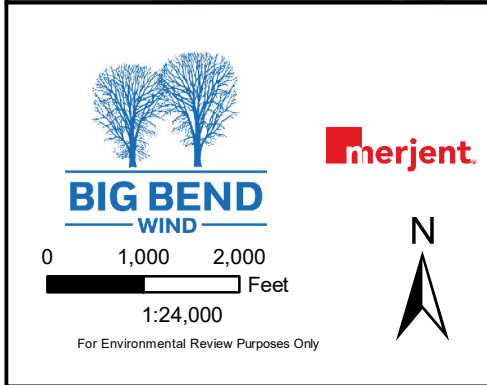
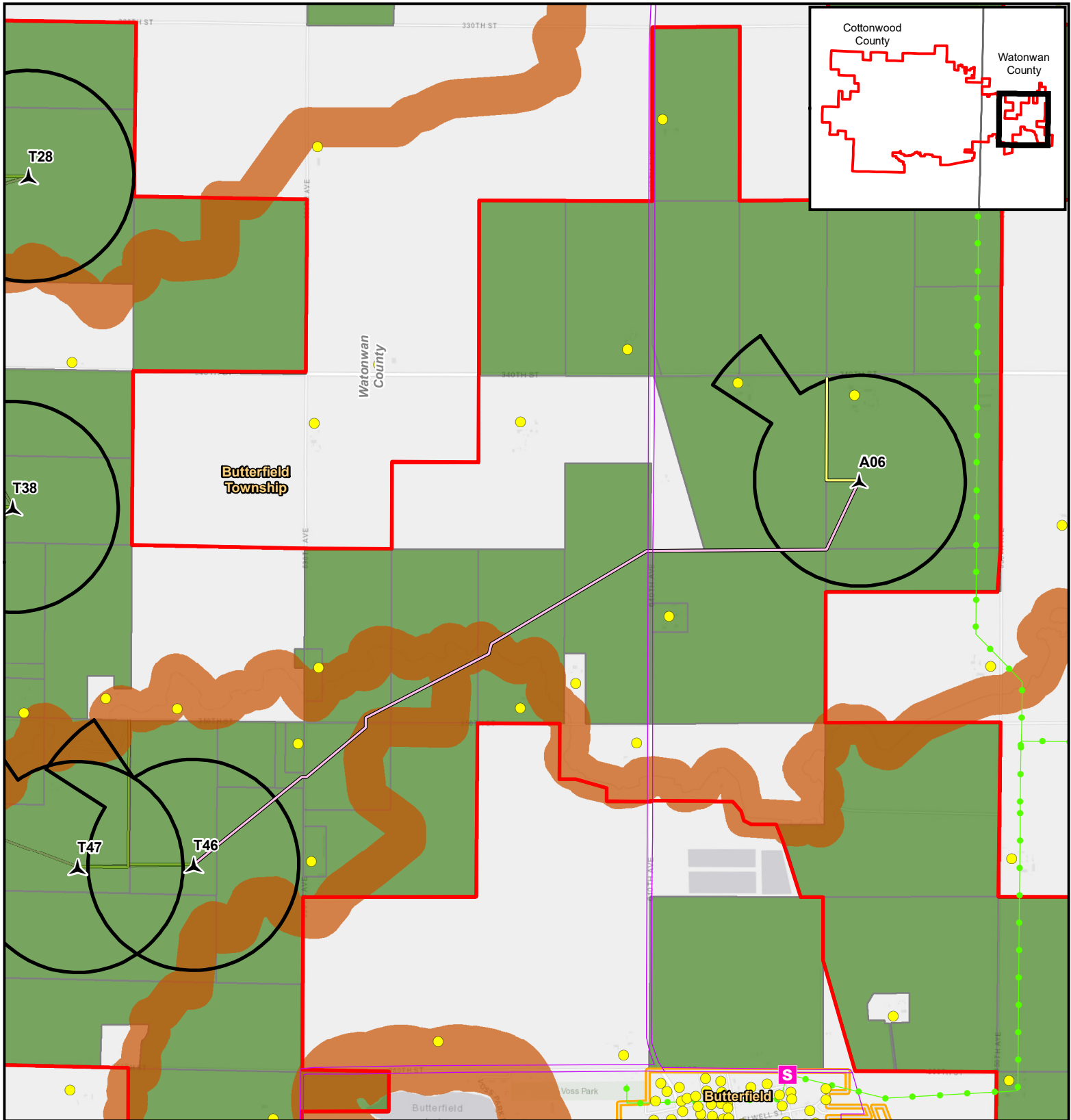
In August 2020, DARE Strategies noted that Apex Clean Energy formally filed the project in the Federal Aviation Administration's Obstruction Evaluation / Airport Airspace Analysis System (OE/AAA). At that time, DARE Strategies explained the project had since expanded and there were eight additional wind turbines east of the county line that were not previously included in the informal consult. The ANG reviewed the updated layout and acknowledged that given its location wind turbine T-37 would cause significant mission impacts and render SR-728 unusable. As originally proposed, wind turbine T-37 was located only 3.4nm from the route boundary at a blind, belly-up right turn. This wind turbine would have forced pilots to climb out of the low-altitude environment to maneuver a C-130 formation. Apex Clean Energy understood the significant mission impacts and agreed to terminate the filing for wind turbine T-37. Once the filing for wind turbine T-37 was terminated, the Department of the Air Force and DoD approved the adjusted layout and cleared the project in OE/AAA.

We appreciate Apex Clean Energy's efforts in working with the Department of the Air Force to reduce mission impacts and identify a shared affordable and feasible solution. Please feel free to reach out to my team at saf.iei.encroachment@us.af.mil with any further questions or concerns.

**JUDD.TERAN.
L.1093717011**

Digitally signed by
JUDD.TERAN.L.1093717
Date: 2021.08.27
15:56:20 -04'00'

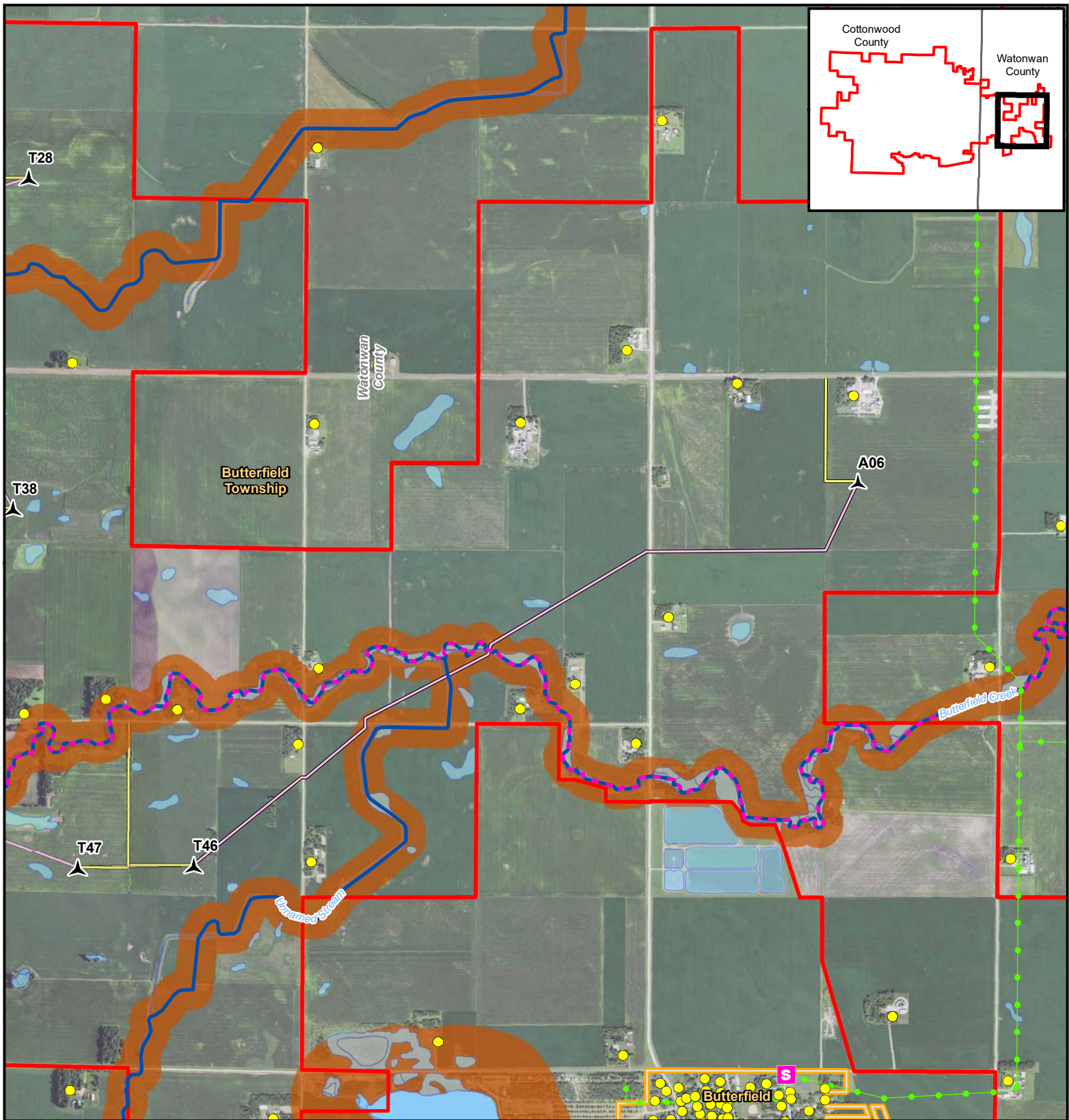
TERAN L. JUDD
Director, Community Partnership &
Encroachment Management



Appendix C Turbine A06

Big Bend Wind Project Cottonwood and Watonwan Counties, Minnesota

- | | |
|--|---------------------------|
| ▲ Proposed Turbine | Project Area Boundary |
| ● Residential Structure (within 1 mile of Project Area Boundary) | Wind Access Buffer |
| — Access Road | Shoreland Management Area |
| — Collection Line | Participating Parcel |
| — Crane Path | |
| — Existing Transmission Line | |



BIG BEND
WIND

0 1,000 2,000
Feet

1:24,000

For Environmental Review Purposes Only

N

Appendix C Turbine A06

Big Bend Wind Project Cottonwood and Watonwan Counties, Minnesota

- | | |
|---|----------------------------|
| ▲ Proposed Turbine Residential Structure (within 1 mile of Project Area Boundary) | Public Water Watercourse |
| Access Road | Impaired Stream |
| Collection Line | Existing Transmission Line |
| Crane Path | Shoreland Management Area |
| Project Area Boundary | NWI (MNDNR Update) |
| | Public Water Basin |