~~FOR THE~~ **PUBLIC UTILITIES COMMISSION**
OF THE STATE OF MINNESOTA
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St. Paul, MN 55101-2147

In the Matter of the Application for a Site Permit Amendment to Repower the Existing 30.75-Megawatt Community Wind South Wind Project in Nobles County, Minnesota.	PUC Docket No. IP-6871/WS-11-863

~~PROPOSED~~ FINDINGS OF FACT AND CONCLUSIONS OF LAW
~~SUBMITTED BY~~
~~ZEPHYR WIND, LLC~~

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This matter is pending before the Minnesota Public Utilities Commission ("Commission"). Zephyr Wind, LLC ("Zephyr" or "Applicant") submitted an application to the Commission on September 30, 2021, requesting an amendment to repower the currently operating Community Wind South Project ("Project"). At the request of the Minnesota Department of Commerce, Energy Environmental Review and Analysis ("EERA") staff, Zephyr has prepared this Findings of Fact and Conclusions of Law with respect to whether the proposed Project meets the site permitting criteria set forth in Chapter 216F of the Minnesota Statutes and Chapter 7854 of the Minnesota Rules.

STATEMENT OF THE ISSUE

Has Zephyr satisfied the criteria set forth in Chapter 216F of the Minnesota Statutes and Chapter 7854 of the Minnesota Rules for an amendment of the Project's site permit to allow for repowering of the Project?

FINDINGS OF FACT

I. The Applicant

1. Zephyr is a wholly owned subsidiary of Greenbacker Renewable Energy Company, LLC ("Greenbacker"). Zephyr does not have any ownership or financial interests in any other large wind energy conversion systems ("LWECS") in Minnesota. Its parent company, Greenbacker, has ownership or financial interests in two other Minnesota wind facilities.

2. Greenbacker is a publicly reporting, non-traded limited liability company that acquires and manages income-generating renewable energy and energy efficiency projects, and other energy-related businesses. With a portfolio of 308 assets, as of August 31, 2021, Greenbacker's gross investments totaled an aggregate generating capacity of 2.2 GW comprising 330.8 MW of wind facilities, 1,821.9 MW of solar facilities, 12.0 MW of biomass, and 16.0 MW of battery storage. Greenbacker acquired Zephyr in August 2019. In addition, Greenbacker provides operations and asset management services to wind and solar projects across the United States. Greenbacker currently owns several projects in nearby states and recently acquired two other Minnesota wind facilities – the 25.3 MW Ridgewind project and the 5.4 MW WindShare project.

II. Site Permit Application and Related Procedural Background

3. On May 1, 2012, the Commission issued an order granting a site permit to CWS Wind Farm, LLC to construct the Project (the "2012 Site Permit").

4. On July 18, 2012, the Commission issued an order authorizing transfer of the 2012 Site Permit to Zephyr.

5. On September 30, 2021, Zephyr filed a site permit amendment application for the Project with the Commission (the "Application") to allow for repowering for the Project.[1]

6. On November 1, 2021, the EERA staff filed comments (the "EERA Comment") recommending that the Commission accept the Application as substantially complete, that the Commission review the Project under the LWECS permit amendment process~~,~~ and use the draft site permit ("Draft Site Permit") attached to EERA's comments for public comment.[2]

7. On November 5, 2021, the Commission issued a Notice of Public Information Meeting and Comment Period, to obtain public input on the Application and to compile a record for the Commission to consider in making a final decision on the permit amendment.[3]

8. On November 18, 2021, Zephyr filed an affidavit of publication, confirming that the Notice of Public Information Meeting and Comment Period was published in the Worthington Globe Newspaper.[4]

9. On November 29, 2021, Commission and EERA staff conducted a public information meeting at the Reading Community Center in Reading, Minnesota.

10. On November 30, 2021, Commission and EERA staff conducted a virtual public information accessible by telephone or the internet.

11. On December 13, 2021, the Minnesota Department of Natural Resources ("MNDNR") filed comments on the Application ("MNDNR Comment").[5]

12. On December 16, 2021, the Minnesota Department of Transportation ("MNDOT") filed comments on the Application ("MNDOT Comment").[6]

13. On December 16, 2021, the Nobles County Planning and Zoning Administrator (the "County") filed comments on the Application ("Nobles County Comment").[7]

14. On January 7, 2022, Zephyr filed comments (i) addressing the public comments received at the public information meeting, (ii) responding to the MNDNR comments, the MNDOT comments, the Nobles County comments, (iii) requesting certain wind access buffer setback waivers, (iv) and providing proposed findings of fact and conclusions of law ("Zephyr Comment").

[1] Initial Site Permit Amendment Application and Appendices A-M by Zephyr Wind, LLC (Sept. 30, 2021) (eDocket No. **20219-178379-02**).
[2] Comments and Recommendations by DOC-EERA (Nov. 1, 2021) (eDocket No. **202111-179411-01**).
[3] Notice of Public Information Meeting and Comment Period (Nov. 8, 2021) (eDocket No. **202111-179567-01**).
[4] Affidavit of Publication (Nov. 18, 2021) (eDocket No. **202111-179969-01**).
[5] Comments by MNDNR (Dec. 13, 2021) (eDocket No. **202112-180614-01**).
[6] Comments by MNDOT (Dec. 16, 2021) (eDocket No. **202112-180745-01**).
[7] Comments by Nobles County (Dec. 21, 2021) (eDocket No. **202112-180896-01**).

III. General Description of the Project

15. The Project consists of 15 operating wind turbines in Nobles County, Minnesota, all of which Zephyr proposed to repower pursuant to the application and associated facilities.

16. Consistent with the 2012 Site Permit, Zephyr constructed 15 REpower MM92 turbines (2.05 MW) with a hub height of 98.5 m (352 ft).[8]

17. Pursuant to the Application, Zephyr is proposing to repower the existing REpower MM92 turbines using Vestas V110 (2.2. MW) turbines. The repowering will require removal of the old nacelles and blades, installation of an adapter on the top of the existing towers, replacement of certain internal turbine equipment, and installation of new nacelles and blades.[9]

18. The new Vestas V110 (2.2 MW) turbines will replace the existing REpower MM92 (2.05 MW) turbines, which will increase the total nameplate capacity of the Project to 33 MW.[10]

19. The repowering includes replacement of the existing blades with new, longer blades. Blade length will increase from 92.5 m to 110 m and the hub height of each turbine will increase from 98.5 m to 105.05 m.[11] Between the longer rotors and hub height adapter, the overall turbine height will increase by approximately 50 feet – from 475 feet (144.75 m) to 525 ft (160.05 m).[12]

20. Although the nameplate capacity of the Project will increase from 30.75 MW to 33 MW as a result of the repowering, the Project will be governed at the point of interconnection to maintain power delivered to the grid at or below 30 MW, as permitted by the Project's interconnection agreement with the Midcontinent Independent System Operator.[13] Zephyr is considering derating the turbines to 2.05 MW for an initial period following repowering construction but may increase the nameplate capacity of each turbine to 2.2 MW in the future.

21. The Project also includes associated facilities, including access roads, collection lines, and other supporting infrastructure. As part of the repowering, most associated facilities will remain unchanged, but minor changes and upgrades are contemplated, including the following:

i. Minor upgrades to the electrical collection system.[14]

ii. Minor shifts in access roads leading to turbine T-2 to accommodate requests from the landowner.[15]

[8] Application at 1-2.
[9] *Id.* at 2.
[10] *Id.* at 2-3.
[11] *Id.* at 3.
[12] *Id.* at 8.
[13] *Id.* at 2-3.
[14] *Id.* at 3, 7, and 10.
[15] *Id.* at 7, 12. Zephyr also noted that the access road to turbine T-14 also was relocated several years ago at the request of the landowner. The current location is reflected in the site plans included in the Application and will not be changed for the repowering.

iii. The repowering may require the substation/switchyard to be expanded to accommodate the addition of capacitor banks for each medium voltage circuit to meet voltage and power factor requirements once the new Vestas wind turbines are installed. If the capacitor banks are required, the existing yard footprint will need to be expanded by up to 35 feet on the east or north side of the yard to accommodate the new equipment. Zephyr will provide further detail about the location of the capacitor banks as part of its pre-construction filings.[16]

iv. The permanent met tower located between turbines T-12 and T-13 may be raised to the new hub height of the repowered turbines (105.05 m).[17]

v. An aircraft detection lighting system ("ADLS") will be added to the Project as part of the repowering.[18]

22. The Project includes a computer-controlled communications system that permits automatic, independent operation and remote supervision of each turbine and the facility collectively, thus allowing the simultaneous control of all wind turbines. The SCADA system, located in a building within the switchyard, collects data on wind turbine generation, availability, alarms, turbine conditions, communication system status, and meteorological data. Performance data and parameters for each machine can also be viewed in real time, and machine status can be changed. The SCADA system also reports and archives generation data.[19]

23. Zephyr has a Generator Interconnection Agreement with Midcontinent Independent System Operator ("MISO"), which is in the process of being amended to accommodate the repower.[20]

24. The Project has been designed to ensure consistency with setbacks and standards established by the Commission and set forth in the Draft Site Permit, other than the following matters for which Zephyr has requested and received waivers:[21]

i. Turbine T-9 encroaches on the Nobles County setback distance to the public road right-of-way by approximately 23 feet. The affected road is a minimum maintenance road and the turbine has been operating in this location since 2012. The County provided a waiver for this setback in its December 16, 2021 comment.[22]

ii. Turbine T-15 is located within 577 feet of a type III, IV, and V wetland based on National Wetlands Inventory desktop mapping instead of the 600 feet required by Nobles County Ordinance. This distance will be confirmed during wetland delineation activities. The turbine has been operating in this location since 2012. The County provided a waiver for this setback in its December 16, 2021 comment.[23]

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[16] *Id.* at 10-11.
[17] *Id.* at 12.
[18] *Id.* at 28, 45.
[19] *Id.* at 71.
[20] *Id.* at 3-4.
[21] *Id.* 19-22.
[22] Nobles County Comment.
[23] *Id.*

iii. Turbine T-12 exceeds the County setback for non-participating property lines by 39 feet. The turbine has been operating in this location since 2012. Zephyr is seeking to execute a participation agreement with the affected neighboring landowner. If Zephyr is unable to obtain a participation agreement, then Zephyr will seek a waiver from the County.[24]

iv. Because longer blades will be installed, the repowering will expand the 3 RD x 5 RD wind access buffer setback area for the Project. Zephyr has obtained executed participation agreements from all such affected landowners other than with respect to four parcels: Parcel 09-0072-000 (affected by Turbine T-13), Parcel 09-0070-000 (affected by Turbines T-12 and T-13), Parcel 17-0032-500 (affected by Turbine T-14), and Parcel 17-0090-500 (affected by Turbines T-1 and T-3). Zephyr will continue good faith negotiations with these landowners to reach commercially reasonable agreements, but in the event agreements cannot be obtained, Zephyr has requested waivers to the wind access buffer setback requirements for Turbines T-1, T-3, T-12, T-13, and T-14.[25]

IV. Site Location and Characteristics

25. The Project is located in Nobles County in southwest Minnesota in Summit Lake and Larkin townships, generally southwest of State Highway 266.[26]

26. The Project boundary encompasses approximately 3,111 acres, all of which are currently leased or subject to participation agreements for the Project.[27]

27. The Project is located within a lightly populated rural, agricultural area. The population density of the Project area is approximately 10.3 people per square mile in Summit Lake Township and 4.5 people per square mile in Larkin Township.[28]

V. Wind Resource Considerations

28. Prior to initial construction of the Project, Zephyr collected wind data from the Project area from November 2007 to September 2012 and has continued to collect data from the operating Project.[29] Composite month wind speed data at 60 m varies from 6.0 m/sec in July to 8.9 m/sec in April. Generally, the spring and autumn are expected to have the highest wind speeds, while the summer is expected to have the lowest wind speeds. Likewise, the daily wind pattern at the Project site has an increase in wind speeds during the evening and overnight hours. During the summer and late autumn/early winter the largest variations occur between daytime and nighttime wind speeds, whereas there is generally less variation in the diurnal pattern the remainder of the year.[30]

VI. Wind Rights and Easement/Lease Agreements

[24] Zephyr Comment at 6.
[25] *Id.* at 7.
[26] Application at 5.
[27] *Id.*
[28] *Id.* at 14.
[29] *Id.* at 63.
[30] *Id.* at 63-64.

29. Zephyr has existing landowner agreements in place for all 15 wind turbine locations. These agreements allow for Zephyr's planned repowering activities. Zephyr is seeking amendments to certain agreements to extend their terms, but the amendments are not necessary for the repowering.[31]

30. Because the repowering will include installation of longer blades, the 3 RD x 5 RD wind access buffer setback areas for some turbines will expand outside the current Project boundary, including in some cases to lands encumbered by agreements for the Nobles Wind Project owned and operated by Xcel Energy.[32] For parcels impacted by both the Project and the Nobles Wind Project, Zephyr is coordinating with Xcel Energy to finalize a mutual consent agreement and to obtain participation agreements directly from the affected landowners. Via this process, with Xcel Energy's consent, Zephyr is seeking agreements from landowners with existing Nobles Wind Project agreements who own land within the Project's wind access buffer setback areas. Accordingly, all affected landowners understand that two different wind projects are relying upon wind rights from their property and have had the opportunity to negotiate terms and compensation for the use of those wind rights with the owners of each of the two wind projects.[33]

31. Zephyr has executed most of the additional wind rights agreements necessary for the expanded 3 RD x 5 RD wind access buffer setback areas and will continue good faith negotiations with all affected landowners.

VII. Project Schedule

32. Zephyr stated in its Application that repowering construction is scheduled to begin in spring 2022 and that construction will take approximately 6-8 months to complete.[34]

VIII. Permittee

33. The permittee for the Project would be the Applicant, Zephyr Wind, LLC.

IX. Summary of Public Comments

34. Commission staff held an in-person public information meeting in Reading on November 29, 2021, and a virtual public information meeting on November 30, 2021. Members of the public attended the in-person meeting in Reading and there were eight verbal comments/questions. These comments and questions covered a broad range of topics including benefits of the repowering to the community, setback requirements, the impact of the repowering on production from the Project and associated production taxes, storage and disposal of the old blades, the impact of repowering on sound, and shadow flicker effects from the Project. EERA staff, Commission staff, and Zephyr provided responses and clarifications to the comments and questions in real time.[35] No members of the public attended the virtual public information meeting.[36]

[31] *Id.* at 6.
[32] *Id.*
[33] *Id.*
[34] *Id.* at 71.
[35] November 29, 2021 Public Information Meeting Transcript.
[36] *Id.* at 23:6-11.

35. Written comments were received from MNDOT, MNDNR, and the County during the public comment period.

36. MNDNR filed a letter commenting on the Application on December 16, 2021. MNDNR recommended that the Project's draft Bird and Bat Conservation Strategy ("BBCS") be revised to include a post-construction fatality plan and noted that MNDNR recommends two years of post-construction fatality monitoring.[37] The Draft Site Permit requires two years of post-construction fatality monitoring[38] and Zephyr has agreed to update the BBCS accordingly.[39]

37. MNDOT filed a letter commenting on the Application on December 16, 2021. MNDOT noted that none of the existing turbines are located near a state trunk highway right-of-way and therefore do not present any concerns to MNDOT. MNDOT also confirmed ~~that it confirmed~~ via discussions with Zephyr that the minor upgrades planned for the Project's electrical system will not affect the collection line crossing of MNDOT trunk highway 266.[40] As recommended by MNDOT, if such plans change, Zephyr agree~~d~~s to seek any necessary utility permits and will coordinate with MNDOT as necessary related to any MNDOT highway construction activities.[41]

38. The County filed comments on December 16, 2021, providing waivers for certain County setbacks that are incorporated by reference into the Project's site permit, including a waiver for the road right-of-way setback with respect to Turbine T-9 and the wetlands setback with respect to Turbine T-15. The County also confirmed that no waivers will be required with respect to non-participating property line setbacks in cases where Zephyr has obtained a participation agreement from the affected neighboring landowner.[42] Zephyr has obtained such participation agreements with respect to T-6 and T-12, but is still negotiating with the neighboring landowner affected by T-12.

X. Site Permit Criteria

39. Wind energy developments are governed by Minnesota Statutes Chapter 216F and Minnesota Rules Chapter 7854. Minnesota Statutes section 216F.01, subdivision 2, defines a "large wind energy conversion system" (LWECS) as any combination of wind energy conversion systems with a combined nameplate capacity of 5 megawatts (5,000 kilowatts) or more.[43] Minnesota Statutes section 216F.03 requires that a LWECS be sited in an orderly manner compatible with environmental preservation, sustainable development, and the efficient use of resources.[44]

40. The Commission also considers the following factors set forth in Minnesota Statutes section 216E.03, subdivision 7(b) when deciding whether to issue a LWECS site permit:

i. "evaluation of research and investigations relating to the effects on land, water and air resources of large electric power generating plants and high-voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from

[37] MNDNR Comment.
[38] Draft Site Permit at Section 7.5.1.
[39] Zephyr Comment at 6.
[40] MNDOT Comment at 1-2.
[41] Zephyr Comment at 6.
[42] Nobles County Comment.
[43] Minn. Stat. § 216F.01, subds. 2-3.
[44] Minn. Stat. § 216F.03; *see also*, Minn. R. 7854.1000, subp. 3.

such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including baseline studies, predictive modeling, and evaluation of new or improved methods for minimizing adverse impacts of water and air discharges and other matters pertaining to the effects of power plants on the water and air environment;

ii. environmental evaluation of sites . . . proposed for future development and expansion and their relationship to the land, water, air and human resources of the state;

iii. evaluation of the effects of new electric power generation . . . systems related to power plants designed to minimize adverse environmental effects;

iv. evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants;

v. analysis of the direct and indirect economic impact of proposed sites . . . including, but not limited to, productive agricultural land lost or impaired;

vi. evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site . . . be accepted;

vii. evaluation of alternatives to the applicant's proposed site . . . ;

viii. evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations;

ix. evaluation of irreversible and irretrievable commitments of resources should the proposed site . . . be approved; and

x. when appropriate, consideration of problems raised by other state and federal agencies and local entities."[45]

41. The Commission must also consider whether the applicant has complied with all procedural requirements.[46]

42. The Commission's rules require the applicant to provide information regarding any potential impacts of the proposed project, potential mitigation measures, and any adverse effects that cannot be avoided as part of the application process. No separate environmental review is required for a LWECS project.[47]

XI. Application of the Statutory Siting Criteria to the Proposed Project

A. Demographics

[45] Minn. Stat. § 216E.03, subd. 7(b).
[46] Minn. R. 7854.1000, subd. 3.
[47] Minn. R. 7854.0500, subp. 7.

43. The Project is located within a lightly populated rural area in southwestern Minnesota in Nobles County near the city of Wilmont, in Summit Lake and Larkin Townships.[48] The population of Nobles County in 2019 was estimated to be 21,734 with a median age of 35.7 years. Summit Lake Township had an estimated population of 372 and a median age of 44 years, and Larkin Township had an estimated population of 162 and a median age of 50 years. While the population of Larkin Township is nearly half the population of Summit Lake Township, the median age is six years older.[49]

44. The total land area in Summit Lake Township is 36 square miles, Larkin Township is 35.9 square miles, and Nobles County is 714.9 square miles. Population densities range from 10.3 persons per square mile in Summit Lake Township to 4.5 persons per square mile in Larkin Township. Overall, the population density of the Nobles County is 30.4 persons per square mile.[50]

45. The predominant race in Summit Lake Township, Larkin Township, and Nobles County is White (alone, not Hispanic or Latino). Less than 10 percent of the population is categorized as a minority population. The largest minority population in Nobles County is composed of residents who identify as Hispanic or Latino origin (of any race), the largest minority population in Summit Lake Township includes residents who identify as two or more races, and similar to the county, the largest minority population in Larkin Township is composed of residents who identify as Hispanic or Latino origin (of any race). Based on these statistics, there is no indication that minority populations are concentrated within the Project area, or that the Project is located in an area occupied by a minority population.[51]

46. Zephyr also evaluated the Minnesota Areas of Environmental Justice Concern interactive map created by the Minnesota Pollution Control Agency ("MPCA"), which identifies areas of environmental justice concern in Minnesota. The MPCA uses U.S. Census tract data in preparing the mapping. A census tract is considered to be an area of concern if it meets one or both of the following: the number of people of color is greater than 50 percent, or more than 40 percent of the households have a household income of less than 185 percent of the federal poverty level. Additionally, communities within Tribal boundaries are also considered areas of concern for environmental justice. [52]

47. The Project falls within two census tracts that bisect the Project area along the township boundary. In Summit Lake Township (census tract 1051), about 18 percent of residents reported income less than 185 percent of the poverty level. In Larkin Township (census tract 1052), about 25 percent of residents reported income less than 185 percent of the poverty level. The only area within Nobles County that meets the area of concern for environmental justice is the City of Worthington, about nine miles southeast of the Project. No portion of the Project is located within a Tribal boundary.[53]

[48] Application at 14.
[49] *Id.*
[50] Application at 14.
[51] *Id.*
[52] *Id.* at 15.
[53] *Id.*

48. Nobles County had an estimated 8,033 total households in 2019 with 626 vacant housing units. While Summit Lake Township had nearly twice as many occupied housing units (139) as Larkin Township (64), they both had the same number of vacant units.[54]

49. The top industries of employment in the county include manufacturing; transportation and warehousing, and utilities; and educational services, and health care and social assistance. The top industries of employment in the townships vary slightly from the county level. The primary industry in Summit Lake Township includes educational services, health care, and social assistance (26.3 percent), and the primary industry in Larkin Township includes agriculture, forestry, fishing, hunting, and mining (27.6 percent).[55]

50. Repowering the Project has the potential to affect the existing demographics in the short term through an influx of construction personnel, which can influence demand for temporary housing. There is no anticipated increase to operations and maintenance staff, and therefore no change to demographics that would affect the total population, demand for housing, or change to the ethnicity or race of the local population. Construction and operation will not displace residents and is expected to have only a minimal, temporary impact on the demographics of the Project area. The continuing operations and maintenance of the Project currently requires approximately two full-time site technicians, and a shared site manager. After repowering, Zephyr anticipates that two permanent technicians will be required for long-term servicing of Project equipment, and one shared site manager. Approximately 40 workers will be required at peak employment during construction. Temporary housing is anticipated to be accommodated by local short-term lodging providers in Worthington and Luverne. If no local contractors are available, the influx of approximately 40 construction personnel would equate to a total population increase of approximately 0.2 percent in Nobles County, 11 percent in Summit Lake Township, and 25 percent in Larkin Township over 2019 census numbers. This would represent a minimal, temporary increase in the total population of the townships. Minority populations make up less than 10 percent of the population in the county. The largest minority population in Summit Lake and Larkin townships is composed of residents who identify as Hispanic or Latino origin (of any race).[56]

51. There is no indication that any minority or low-income population is concentrated in any one area of the Project, or that the wind turbines have been placed in an area occupied primarily by any minority population. For this reason, the Project is not expected to have a disproportionate impact on environmental justice communities.[57]

52. Zephyr will issue a Request for Proposal ("RFP") to qualified contractors to oversee and manage the construction for the repowering. In this RFP, Zephyr intends to include a strong preference for bids that utilize local, union construction craft employees to the greatest extent possible in accordance with the Project's timeline and safety requirements. Zephyr expects the selected contractors will collaborate with organized labor unions and other stakeholders to develop a workforce and hiring plan that maximizes the local economic benefits of the Project. Based on a review of the MPCA's interactive Environmental Justice map, and applicable statistics from the U.S.

[54] *Id.*
[55] *Id.* at 16.
[56] *Id.* at 17.
[57] *Id.*

Census Bureau, it was determined that the Project is not located within an area identified as a concern for environmental justice, and therefore no mitigation measures are anticipated.[58]

B. Zoning and Land Use

53. The primary regulatory approval required for the repowering construction and operation of the Project is an amended site permit issued by the Commission. Pursuant to the Minnesota Wind Siting Act ("Act"), the Commission has been given the responsibility and authority to accept, evaluate, and grant permits for wind projects in Minnesota. The Act provides that "[n]o person may construct an LWECS without a site permit issued by the Public Utilities Commission."[59] The Act defines an LWECS as any combination of wind turbines and associated facilities with a nameplate rating equal to or greater than 5,000 kW. Furthermore, Minnesota Statutes Section 216F.07 (2020) states, "A permit under this chapter is the only site approval required for the location of an LWECS. The site permit supersedes and preempts all zoning, building, or land use rules, regulations, or ordinances adopted by regional, county, local and special purpose government."[60]

54. The Nobles County Zoning Ordinance, Section 729, outlines the procedures and regulations established for wind energy conversion systems ("WECS"). WECS will be permitted based on the generating capacity and land use district. While the ordinance does not contain provisions regulating repowering of an existing WECS, a Conditional Use Permit ("CUP") and Land Use Permit approved by the County Board will be required for the staging and laydown areas, and for expansion of the substation/switchyard. Once submitted, the County notifies the Applicant, neighbors, Planning Commission, and the media of the Public Hearing. The process takes 45 to 60 days from the date of the permit application for final approval. Zephyr will continue to coordinate with Nobles County regarding additional permits or approvals that may be required.[61]

55. Certain setbacks applicable to WECS in the Nobles County Zoning Ordinance are incorporated into the Project's existing site permit and the Draft Site Permit.[62] Other than the specific waivers Zephyr has requested, the Project is designed to meet these requirements.

56. Pursuant to Minnesota Statutes Section 394 (2020), Nobles County prepared the 2025 Nobles County Comprehensive Plan ("Comprehensive Plan"), also referred to as the Nobles County Community Based Plan. According to the Comprehensive Plan, residents would like to see progress in zoning for wind energy projects to ensure appropriate development. The Comprehensive Plan states that wind development has the potential to provide an abundant amount of economic opportunities in the future, notably as an export industry for the County. The Comprehensive Plan discusses many positive aspects of wind energy, including job creation, increase in the tax base, and income supplementation for landowners; however, the Comprehensive Plan also notes some potential areas of concern including visual impacts and wildlife. Section 8.4 addresses the visual impacts and mitigation, and Section 8.19 addresses wildlife resources in the Project area.

[58] *Id.*
[59] Minn. Stat. § 216F.04(a) (2020).
[60] Application at 18.
[61] *Id.*
[62] Draft Site Permit at Section 6.1.

Additionally, the Applicant is actively working with Summit Lake and Larkin Townships in regard to the use of township roadways and other utility and access permits that may be required.[63]

57. The repowered Project, as proposed, is consistent with existing county zoning and land use plans.

C. Noise

58. The MPCA has adopted noise standards designed to protect public health and minimize citizen exposure to inappropriate sounds.[64]

59. Zephyr conducted a noise propagation and modeling assessment for the turbine locations.[65] Predicted noise levels were determined using WindPRO modeling software. The Applicant modeled the noise impacts on the residential dwellings, hotels, medical service facilities, educational facilities, camping areas, and religious or cultural gathering areas within the Project area and up to two miles from a turbine location.[66]

60. The sound assessment determined that no occupied or unoccupied residential dwellings will be impacted by total sound levels exceeding 60 dBA during the daytime or 50 dBA during the nighttime.[67]

61. Minor, temporary construction noise will be generated by repowering from typical construction equipment such as cranes, component delivery trucks, dump trucks, and graders. In general, construction noise will be less than experienced during Project construction as access roads, turbine pads, towers, and collection lines will remain in place. Deliveries will also be fewer as the repower will not require concrete for turbine foundations. Machinery will be properly muffled, as required by law, and hours of operation will be consistent with County standards for similar construction projects. Because of the rural nature of the Project location, construction-related noise is expected to be typical of farming operations during the height of planting and harvest seasons.[68]

62. The Project has been in continuous commercial operation since 2012. There have been no noise complaints filed with the Commission during its operational history.[69]

63. Section 7.4 of the Draft Site Permit requires Zephyr to file a proposed methodology conducting a post-construction noise study at least 14 days prior to the pre-construction meeting. Furthermore, the Draft Site Permit requires Zephyr to conduct the post-construction noise study and file with the Commission the completed post-construction noise study within 18 months of completion of the repowering.[70]

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[63] Application at 18.
[64] Minn. R. 7030.0040.
[65] Application at 26; Appendix G.
[66] Application at 26; Appendix G.
[67] Application at 26; Appendix G.
[68] Application at 27.
[69] *Id.* at 26.
[70] Draft Site Permit at Section 7.4.

64. Based on the assessment conducted by Zephyr and plans for monitoring, the repowering is not expected to have significant noise impacts.

D. Shadow Flicker

65. Shadow flicker is a flickering effect caused by the rotation of wind turbine blades casting periodic shadows on an observer. This is generally observed in areas within two km of a wind turbine and decreases with distance as the shadow effect diffuses. Additionally, shadow flicker effects are greatest in the winter months and during sunrise and sunset due to the lowered angle of the sun casting longer shadows. Multiple independent conditions must be met for shadow flicker to occur, and these conditions play a role in the intensity and frequency at which a receptor may experience shadow flicker.[71]

66. Zephyr completed shadow flicker modeling for the repowering.[72] WindPRO software was used to model shadow flicker at a total of 64 participating and nonparticipating residential dwellings within two miles of a wind turbine. Fine resolution shadow flicker maps were generated for the turbine array. The 64 shadow receptors were modeled as greenhouse-mode receptors during the estimated shadow flicker calculation for the array. With one exception, no shadow receptors are expected to experience more than 26 hours and 6 minutes of shadow flicker per year. The remaining receptor is expected to experience 35 hours and 14 minutes of shadow flicker per year. This receptor is owned by a participating landowner. Of the 64 shadow receptors, 29 (45.3%) registered no shadow flicker hours.

67. Section 7.2 of the Draft Site Permit requires that data on shadow flicker be provided prior to the pre-construction meeting, including the results of the study and the assumptions made.[73]

68. Zephyr has been in continuous commercial operation since 2012. There have been no shadow flicker complaints filed with the Commission during its operational history. Zephyr will evaluate any comments received regarding flicker. In coordination with the affected party, Zephyr will evaluate potential flicker minimization options in the unlikely event more flicker is present than was modeled.[74]

69. With the adoption of the mitigation measures discussed above, the Project is not expected to result in significant impacts due to shadow flicker.

E. Visual Impacts

70. Visual impacts to private lands and homes are not anticipated to be substantially different from the current, operating condition. Minor, temporary visual impacts to the existing agricultural landscape will occur with the presence of construction cranes for replacement of nacelles and blades, and from erosion control best management practices ("BMPs") such as silt fence and fiber blanket within soil disturbance areas. Cranes, equipment, and temporary BMPs will be removed following the repowering activities. Because most of the areas proposed for disturbance are

[71] Application at 29.
[72] *Id.* at 30; Appendix G.
[73] Draft Site Permit at Section 7.2.
[74] Application at 30.

agricultural lands, visual impacts associated with erosion control BMPs should be relatively minor. Aside from slightly taller turbines and longer blades, no permanent change to the visual landscape is anticipated. The turbines will be 50 feet taller than the current turbines, a change of roughly 10 percent in overall height. This relatively small change in height, given the scale of the turbines, size of the Project area, and other turbines in the region, is not anticipated to be perceptible by the viewer or create a vastly different landscape experience. The Project is surrounded on three sides by the Nobles Wind Project, which has been in operation since 2010 with a total of 134 turbines.[75]

71. The Federal Aviation Administration ("FAA") requires obstruction lighting or marking of structures over 200 feet above mean sea level because they are considered obstructions to air navigation. The FAA standards, as described in Chapter 13 of FAA Advisory Circular 70/7460-1L, indicate that turbines should be painted white or light grey, and obstruction lighting should consist of synchronized FAA L-864 aviation red flashing, strobe, or pulsed obstruction lights. Specific lighting and marking plans for the repowered Project will be closely coordinated with the FAA. Additionally, for safety during construction, the FAA recommends the use of Type L-810 steady red-light fixtures.[76]

72. Zephyr will abide by the FAA's recommendations regarding required obstruction lighting. All 15 turbines will be required to have synchronized red lights in accordance with the FAA's issued Determinations of No Hazard. Zephyr will coordinate with the FAA regarding implementation of an ADLS system for the Project that is appropriate for the Project's location and size. [77]

73. Section 5.3.29 of the Draft Site Permit requires that Zephyr install and employ an FAA-approved lighting mitigation system. Such a system must use ADLS, dimming, or another FAA-approved mitigation method and must be described in the Project's site plan.

74. With these mitigation measures, the Project is not expected to have a significant visual impact on the landscape.

F. Public Services and Infrastructure

75. The repowering is expected to have minimal effect on existing services and infrastructure of the area. Repowering will be of much lower intensity and extent than building a new wind project of similar size, as much of the construction activity such as installing roads, foundations, towers, underground electrical systems, transmission interconnections data communication, O&M building, etc. will not occur. In addition, the duration of construction is significantly shorter than building an entirely new project, and therefore less overall impact upon public services and infrastructure. Once the repower is completed, O&M activity, and use of public services and infrastructure, would not increase from levels prior to the repower. The repowering is designed to have manageable temporary effects on the existing infrastructure during construction and operation. Because only minor impacts are expected, extensive mitigation measures are not anticipated.

[75] *Id.* at 27-28.
[76] *Id.* at 28.
[77] *Id.*

G. Cultural and Archaeological Resources

76. Zephyr conducted a cultural resources literature search by examining files through the online portal maintained by the Office of the State Archaeologist ("OSA"), and through a database and paper file search request to the Minnesota State Historic Preservation Office ("SHPO") at the Department of Administration in St. Paul, MN.[78] Archaeological site files and historic structure inventory files were used to obtain a list of previously recorded archaeological sites and historic structures within the Project area. Cultural resource reports were investigated to determine whether any portions of the Project area had been previously surveyed for cultural resources. A review of survey reports at SHPO revealed that previous cultural resources surveys (archaeology and/or historic architecture) have been conducted for earlier phases of this wind farm.[79]

77. As the repowering consists of retrofitting existing turbines and most likely using existing infrastructure, it is anticipated that ground disturbance will be limited primarily to crane paths and intersection improvements. Intersection improvements will likely be similar in design and construction to the originally "permitted" entries and should pose no additional impact to archaeological resources. If ground disturbance goes outside of existing infrastructure and crane path areas, there is the possibility that unrecorded archaeological resources could be impacted. An archaeological survey is planned prior to construction to review areas of new ground disturbance (i.e., new crane paths, staging/laydown, switchyard expansion) that have not been previously surveyed for archaeological resources.[80]

78. Consistent with the Draft Site Permit, if Zephyr encounters an archaeological or historic resource, it will contact and consult with the SHPO and OSA. The resources will be assessed for eligibility on the National Register of Historic Places. Zephyr will examine the potential impact on the resource and avoid impacts by adjusting the layout whenever possible. If avoidance is not possible, Zephyr will work with the SHPO, OSA, and American Indian communities to determine appropriate mitigation measures.[81] ~~If human remains are uncovered, Zephyr will contact the OSA and appropriate authorities.~~ If human remains are encountered during construction, the Permittee shall immediately halt construction at such location and promptly notify local law enforcement and the State Archaeologist.[82]~~83~~ Section 5.3.16 of the Draft Site Permit addresses Archaeological and Historic Resources.

79. With these avoidance and mitigation measures in place, impacts on cultural and archaeological resources are expected to be minimal.

[78] *Id.* at 39; Appendix I.
[79] Application at 39; Appendix I.
[80] Application at 41.
[81] *Id.* at 41-42.
[82] Draft Site Permit, Section 5.3.16.
[83] ~~*Id.* at 41-42.~~

H. Recreational Resources

80. The recreational resources within 10 miles of the Project include Wildlife Management Areas ("WMAs") and Waterfowl Production Areas ("WPAs"). Recreational opportunities in the area include hunting, fishing, snowmobiling, camping, biking, and hiking.[84]

81. There are five WMAs and one WPA located within five miles of the Project area. There are an additional 12 WMAs, one County campground/park, and a Scientific and Natural Area ("SNA") located within 10 miles of the Project area. State snowmobile trails are also present surrounding the Project area. WMAs are operated by the MNDNR and were established to protect lands that have a high potential for wildlife production. These areas provide recreational opportunities to the public such as hunting, wildlife and native plant viewing, and nature photography. WPAs are owned and managed by the U.S. Fish and Wildlife Service ("USFWS"). These areas are intended to preserve critical habitat for waterfowl and other wildlife. The recreational opportunities available to the public at these areas include wildlife and plant viewing, photography, and hunting. The SNA program is managed by the MNDNR. These areas are designated to preserve ecological diversity and rare species within the state. Recreational opportunities in these areas consist of wildlife and plant observation and photography. More intensive recreational activities, such as hunting or camping, are not generally allowed in these areas. Nobles County supports several County parks. Adrian Lower Park is located in the town of Adrian and offers day-use recreational opportunities such as disc golf and swimming. A campground, owned by the City of Adrian, is also located within the park and offers camping opportunities.[85]

82. The repowering of the Project will avoid direct impacts to recreational resources. Total wind turbine height after repowering will increase by 50 feet. Potential visual impacts to recreational resources around the Project boundary related to adding slightly larger rotors to the turbines will be minimal.[86]

83. While the Project may cause some visual impacts in certain recreational areas, the construction and operation of the proposed repowering is not expected to have an adverse effect on existing recreational opportunities.

I. Public Health and Safety

i. EMF and Stray Voltage

84. Electromagnetic fields ("EMFs") arise from the movement of an electrical charge on a conductor such as transmission lines, power collection (feeder) lines, substation transformers, house wiring, and electrical appliances. EMFs are commonly associated with power lines, but they occur only at close range because the electric field rapidly dissipates as the distance from the line increases.[87]

[84] *Id.* at 42.
[85] *Id.*
[86] *Id.* at 43-44.
[87] *Id.* at 44.

85. Extensive research has been conducted by the National Institute of Environmental Health Sciences. A number of epidemiological studies have been conducted in an attempt to determine if EMFs pose a health risk. While some of these studies have found a weak association between leukemia and exposure to EMFs, other studies have found no connection. Laboratory studies have also been conducted but have not been able to substantiate a direct relationship between increased electromagnetic activity and increased cancer risks. EMFs from underground electrical collection and feeder lines dissipate very quickly and relatively close to the source because they are installed below ground to a depth of approximately 48 inches and are heavily insulated and shielded. Consequently, the electrical fields that emanate from buried lines and transformers are generally considered negligible, and magnetic fields often decrease significantly within approximately three feet of stronger EMF sources (such as transmission lines and transformers).[88]

86. No changes to the Zephyr electrical system will occur except for installing new capacitor banks for each medium voltage circuit in order to meet voltage and power factor requirements, minor potential collection upgrades within approximately 100-200 feet of the Nobles substation, and testing of the system. These upgrades will occur at the substation locations and well away from typical EMF receptors. The nearest home to the project substation is roughly 0.4 miles to the north. Consequently, no significant increase in EMF impact is expected from the repowering or operation of the Project. Zephyr is not aware of any complaints or claims of impact from EMFs since the project became operational, and no complaints regarding EMFs have been filed to the Project docket.

87. Based upon current research regarding EMFs and the separation distances being maintained between transformers, turbines, and collector lines from public access and occupied homes, EMFs associated with the repowering -are not expected to have an impact on public health and safety. Because no changes to the electrical system with the repowering that could increase EMFs are expected, no significant mitigations related to EMF are planned. Zephyr is committed to inspecting and maintaining the electrical infrastructure and installing facilities in a manner that minimizes the potential for EMFs.

ii. Aviation

88. Aviation resources surrounding the Project were investigated. According to the FAA, one registered airport is located within 10 miles of the Project area. Worthington Municipal Airport (FAA Code OTG) is located approximately 9.9 miles outside of the Project area and approximately two miles north of Worthington. The airport is open to the public and has been in operation since 1946.[89]

89. Zephyr received Determinations of No Hazard ("DNH") to Air Navigation from the FAA for the increased rotor diameter of 110 m and tower heights on July 9, 2020. The aeronautical studies revealed that the structures would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. As such, no impacts from the Project to aviation are anticipated.[90]

[88] *Id.*
[89] *Id.* at 45.
[90] *Id.*; Appendix F.

90. Zephyr will coordinate the lighting plan so that it is consistent with FAA standards and in accordance with the issued DNHs. Zephyr has evaluated ADLS options and will coordinate with the FAA in regard to the design and implementation of an ADLS system appropriate for the project's location and size, and associated compliance with the new Minnesota Statutes –Section 216F.084.[91]

91. With the above mitigation and notification measures in place, the repowered Project is not expected to have a significant impact on aviation.

iii. Safety and Security

92. Security measures will be taken during construction and operation of the repowered Project including temporary and permanent fencing, warning signs, and locks on equipment and wind power plant facilities as appropriate. All construction workers will be required to adhere to Zephyr's corporate safety plan. The objective of the Emergency Preparedness and Emergency Action Plan is to outline the course of action associated with emergencies, evacuations, and fire prevention. This instruction applies to all personnel doing business at the Project location, and includes activities in offices, in the field, as well as working within wind turbines. A copy of the safety plan will be available in a common location at the Project site so each employee has access to the plan.[92]

93. Potential safety and security impacts resulting from the repowered Project are a primary consideration to Zephyr because wind energy projects consist of complex, large electrical generating structures requiring specialized equipment, high voltages, and trained workers for installation and operations. This Project is located on leased rural properties in a relatively remote area. No serious safety or security incidences have been reported at the Project site during the past eight years of operation or filed as a complaint on the Project docket.[93]

94. The Project is not expected to significantly impact public safety.

J. Hazardous Waste

95. The wind turbines use lubricants in the gearboxes and hydraulic fluid for the blade pitch actuators. Waste oil will be collected from each repowered turbine and pad mount transformer and will be properly handled and disposed of by qualified technicians in accordance with state and federal regulations. Any hazardous materials generated by the repowered Project will be stored and disposed of in accordance with Minnesota Rules Chapter 7045. Wastes generated at the Project site will be hauled off-site and disposed of under a U.S. EPA Small Quantity Hazardous Waste License. A search of the MPCA's "What's in My Neighborhood?" database listed five registered feedlots within the Project area. No other sites were mapped within the Project area.[94]

96. Minimal amounts of hydraulic oil, lube oil, grease, antifreeze, and cleaning solvents will be used on the site to repower the wind turbines, and within construction equipment such as

[91] Application at 45.
[92] *Id.*
[93] *Id.* at 46.
[94] *Id.*

cranes, dump trucks, and graders. Materials will be transported, handled, and disposed of by trained and qualified personnel utilizing established procedures and proper equipment. Lubricants, used oils, coolants, and waste products will be handled according to applicable regulations and disposed of through an approved waste disposal firm.[95]

97. The Draft Site Permit requires Zephyr to take precautions to protect against pollution and comply with all applicable laws regarding the generation, storage, transportation, and cleanup of all wastes associated with construction and restoration.[96]

98. Significant impacts from hazardous waste associated with the Project are not expected.

K. Land-Based Economies

i. Agriculture

99. Land use within the Project area is primarily agricultural. According to the U.S. Department of Agriculture's ("USDA") 2017 Agricultural Census, approximately 90 percent of the land within Nobles County is farmland.[97] Approximately 55 percent of the soil within the Project area is considered prime farmland, six percent is farmland of Statewide Importance, and eight percent is not prime farmland. The remainder is prime farmland if drained or protected from flooding. During repowering, some cropped areas will be temporarily cleared to facilitate work at the turbine pads, crane pads, crane pathway, road-widening locations, and staging areas. After repowering is completed, crops and vegetation will be re-established during the growing season.[98]

100. To the extent possible, Zephyr will avoid impacts to farmland and pasture. Because this is a repowering project, the only impacts to the landscape will be temporary for work around turbine pads, crane pads, crane pathway, staging areas, and access road widening. Temporary impacts will total approximately 79 acres, with 15, 16, and 48 acres of impact for turbine work areas, staging/laydown/substation areas, and crane paths/pads, respectively.[99]

101. To mitigate impacts resulting from compaction, the construction equipment used to erect the wind turbine components, much like agricultural equipment, is designed with wide tires and tracks to distribute their weight over a larger area and provide stability. Once repowering is complete, Zephyr will assess disturbed areas and determine whether excessive soil compaction has occurred in conjunction with the affected landowners. In areas where soil compaction has occurred from repowering activities, Zephyr will work with landowners and establish appropriate corrective action measures (e.g., tilling, ripping, or other methods). Sites used for temporary storage, material staging, and access areas typically experience significant amounts of traffic, and will likely require de-compacting prior to resuming agricultural use.[100]

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[95] *Id.*
[96] Ex. 24 at Section 5.2.23 of Draft Site Permit (Order Issuing Draft Site Permit).
[97] USDA, 2017.
[98] Application at 47.
[99] *Id.*
[100] *Id.* at 47-48.

102. While significant impacts to drain tiles and other existing facilities due to repowering are not anticipated, Zephyr will promptly repair or replace drain tile that may be impacted. Prior to beginning site work, Zephyr will contact the landowner where the work will be conducted to properly identify and locate drain tiles or other underground structures that may be present in the work area.[101]

103. Overall, impacts to agriculture as a result of the repowering are anticipated to be short term, minimal, and are not expected to significantly alter crop production. Once the repower is completed, Zephyr will restore disturbed areas as close as practicable to its original condition. Post-construction restoration will largely depend upon the amount of disturbance occurring on the site and the soil types at each location. While in operation, it may occasionally be necessary for Zephyr to complete repairs, or clear/spray vegetation around a turbine or substation cap bank area, which could result in additional temporary impacts to agricultural operations. These interruptions are expected to be infrequent and short term, and landowners will be compensated in accordance with the terms of their agreements with Zephyr.[102]

104. The Draft Site Permit contains a number of provisions protecting agricultural production. Zephyr is required to protect and segregate topsoil during construction, minimize soil compaction, replace or repair fences and gates damaged or removed during the life of the Project, and repair or replace damaged drainage tiles.[103]

105. The Project is not expected to significantly impact agricultural production within the Project area.

ii. Mining and Forestry

106. There are no economically important forestry resources within the Project area. No significant impacts to forestry resources are anticipated. Wooded areas near farmsteads and waterbodies will be avoided by the Project. While significant tree removal is not anticipated, some trees and limbs may occasionally need to be removed for crane access or trimmed to prevent damage to the Project infrastructure from wind and ice, and to ensure reliable operation.[104]

107. There are no significant mining resources within the Project area. No impacts to mining resources or operations are anticipated to accommodate repowering or continuing Project operation.[105]

L. Tourism

108. Nobles County offers community-centered tourism and recreational opportunities throughout the year. While there are currently no tourism attractions within the Project area, there

[101] *Id.* at 48.
[102] *Id.*
[103] Draft Site Permit at Sections 5.3.6, 5.3.7, 5.2.19, and 5.2.20 of Draft Site Permit.
[104] Application at 48.
[105] *Id.*

are tourism opportunities throughout the county. The primary tourism draws near the Project area include outdoor recreational opportunities such as WMAs, SNAs, and snowmobile trails.[106]

109. The repowering is not expected to cause significant impacts to local tourism activities.

M. Local Economy

110. The repowering is expected to positively impact the local economy by adding temporary jobs. About 40 temporary jobs are expected to be added for construction; temporary technicians will be mobilized as needed; and two permanent technicians and a shared site manager will service the Project for the long term. The communities near the Project area are also expected to receive positive economic benefits. Short-term impacts to the socioeconomic resources of the area are expected to be minor. It is anticipated that some land will be temporarily removed from agricultural production for less than a year while the repowering work is accomplished, but landowners will be compensated for this loss under the terms of their landowner agreements. Repowering is anticipated to stimulate some local industries (e.g., hotels, restaurants, gas stations) and is not expected to have any negative impacts to local industries as a whole. At a minimum, repowering is expected to extend the positive economic life of the Wind Farm for at least 20 years, thereby extending the economic benefits as well.[107]

111. The wind energy production tax for the Project is assessed at $1.20 per megawatt-hour (MWh) of electricity produced. The repowering will result in increased tax payments of approximately 10 percent per year, compared to current tax payments, to Nobles County due to increased production.[108]

N. Topography

112. Topography within the Project area is generally undulating, consisting of rolling hills, stream networks, floodplains, and wetlands. Overall topography is generally highest in the west and decreases towards the east. The highest elevation on the site is approximately 1,748 feet above mean sea level ("amsl"), and the lowest elevation is approximately 1,648 feet amsl.[109]

113. No significant impacts to topography are anticipated, because only limited, if any, grading will be required to repower the Project. Grading within steep slope areas will be avoided to the degree practicable. Minimizing cut and fill requirements will reduce erosion control potential as well as decrease overall construction costs. Laydown and staging areas have been sited in relatively flat locations absent of steep slopes to avoid excess grading.[110]

114. The Draft Site Permit requires Zephyr to restore and reclaim the site to its pre-project topography "to the extent feasible."[111]

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[106] *Id.* at 49.
[107] *Id.*
[108] *Id.* at 50.
[109] *Id.* at 51.
[110] *Id.*
[111] Draft Site Permit at Section 11.2.

115. Construction BMPs will be implemented surrounding graded areas in accordance with state standards, the MPCA Stormwater Best Management Practices Manual, and the approved Stormwater Pollution Prevention Plan ("SWPPP") for the Project area.[112]

116. With these mitigation measures in place, no significant impact to topographic resources is anticipated.

O. Soils

117. The soils of Nobles County formed in several parent materials. The major kinds of parent material include: glacial till, loess, glacial outwash, alluvium, colluvium, and organic material. The soils are dark colored because they formed under an original vegetation of tall grass prairie. Glacial till or a thin loess mantle over glacial till are the parent materials of about 65 percent of soils in Nobles County. It is composed of older glacial till that was reworked by the Tazewell and Cary substages of the Wisconsin glaciation.[113]

118. Repowering the Project will likely result in minor short-term impacts to soils within the Project area. Most of the impacts to soils will result from grading to accommodate temporary laydown areas, crane paths, intersection improvements, and expansion of turbine pads for construction cranes. The temporary 5 ~~to~~ 10 ~~-~~acre laydown yard(s) will be constructed on agricultural lands to stage the turbine components prior to installation as well as other routine construction uses. No additional impacts are expected from continued operation of the Project.[114]

119. The potential for construction-related soil erosion will be minimized by siting laydown areas to avoid highly erodible soils on steep slopes. Avoiding steep topography will also reduce the size of cut and fill areas. Zephyr will work with landowners in the Project area to site the staging/laydown areas to minimize impacts to prime farmland to the extent practicable. Within work areas, topsoil will be separated from subsoils, protected from erosion and runoff using mulch, and then respread over disturbed areas once work is completed. Erosion control measures would also be implemented during construction to avoid or minimize soil erosion and off-site deposition. Erosion and sedimentation will be reduced through the use of BMPs such as mulching, hydroseeding, erosion control blankets, silt fence installation, jute matting, revegetation, and/or interim reclamation. After repowering is completed, soils will be planted with crops or revegetated to stabilize them in the long term.[115]

120. The Draft Site Permit requires Zephyr to implement erosion prevention and sediment control practices recommended by the MPCA Construction Stormwater Program. It also requires Zephyr to "obtain a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater permit from the MPCA that provides for the development of a Stormwater Pollution Prevention Plan (SWPPP) that describes methods to control erosion and runoff."[116]

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[112] Application at 51.
[113] *Id.*
[114] *Id.* at 52.
[115] *Id.*
[116] Draft Site Permit at Section 5.3.8.

121. With these mitigation measures in place, no significant impacts to soil resources are anticipated.

P. Geologic and Groundwater Resources

122. The crest of the Coteau des Prairies ridge extends across the county from northwest to southeast and consists of a bedrock core that is overlain by Cretaceous strata. Cretaceous strata is composed of interbedded shale, siltstone, and sandstone. Sioux Quartzite and granite are the oldest bedrock units found in the county. Both are of Pre-Cambrian age and underlie most of the county. The depth to bedrock throughout the county varies from 150 to 500 feet. In the northeast and northwest parts of the county, the Sioux Quartzite is directly overlain by glacial drift. Bedrock is not known to outcrop in the county. Surficial outwash deposits fill valley bottoms and form the terrace deposits associated with the present-day drainage channels. These are generally made up of sand gravel, and some silt and clay, and range in thickness from 0 to 60 feet or more.[117]

123. Geologic resources in the county include sand and gravel deposits. The types of aquifers in the county are varied. The primary source of groundwater in Nobles County is the glacial drift. Buried outwash deposits supply water to 7 of the 10 municipalities, and to most of the farms in the area. Sioux Quartzite also yields water obtained from the fissures of interbedded shale or fractures in the quartzite. Water yield from the quartzite is generally low and it occurs sporadically throughout the county. It is not deemed an important water source in this area. Cretaceous sandstone units are a secondary source of groundwater.[118]

124. Impacts to geologic and groundwater resources from the repowering are not anticipated, as there will be only minimal surface disturbance for temporary construction crane paths, staging/laydown, and switchyard expansion.

Q. Surface Water and Wetland Resources

125. Surface water and floodplain resources for the proposed project area were identified by reviewing USGS Topography, National Hydrography Dataset, and Public Waters Inventory Mapping for the Project area. Several unnamed ditches and watercourses exist within the Project boundary as shown on Map 15, but there are no large lakes, ponds, or other open waterbodies. The MNDNR Public Waters Inventory ("PWI") map for Nobles County shows three public watercourses located within the Project area. Two of these are unnamed and the other is the East Branch Kanaranzi Creek. There are no other public watercourses or basins located within the Project area. A portion of the East Branch Kanaranzi Creek, located approximately one mile south of the Project area, is listed as an impaired waterbody due to E.coli, turbidity, fishes, bioassessments, and benthic macroinvertebrate bioassessments.[119]

126. There are no designated wildlife lakes within Nobles County. There are also no known outstanding resource value waters, sensitive lakeshores, or trout streams within the Project

[117] Application at 53.
[118] Application at 53.
[119] *Id.*

area. As there are none of the aforementioned resources located within or adjacent to the Project area, it is unlikely that they will be negatively impacted.[120]

127. Flood Insurance Rate Maps produced by the Federal Emergency Management Agency ("FEMA") were reviewed for the Project area. The majority of the Project area is located outside of the 100-year floodplain. Within the central portion of the Project area, there are a couple 100-year floodplains classified as Zone A. These floodplains coincide with the two unnamed MNDNR public watercourses located in the Project area. There are no setbacks to floodplains required by Nobles County.[121]

128. No calcareous fens are known to be located within the Project area or within one mile of the Project area. Nobles County has one designated calcareous fen located west of the town of Adrian, about 7.5 miles southwest of the Project. Consequently, no impacts to fens are anticipated from the repowering process. Proposed temporary crane paths, staging/laydown yard(s), and any intersection improvement areas will be reviewed for the presence of calcareous fens during wetland delineation activities.[122]

129. Due to the presence of watercourses within the Project area, permits may be required for temporary crane crossings or for routing electrical collection lines. However, Zephyr has identified the previously used crane path routes and intends to use these routes to the degree it is practical. The previous crane path routes avoided crossing identified public watercourses located within the Project area. Only minimal, if any, impacts to FEMA floodplains are anticipated during the repowering process for the Project.[123]

130. The Project is not expected to significantly impact surface water resources.

R. Wetlands

131. Using the National Wetland Inventory dataset, a total of 71 potential wetlands, totaling 161 acres, were identified within the Project boundaries. Of these, 36 were categorized as freshwater emergent wetlands (146 acres), 30 were riverine (13 acres), one was freshwater forested/shrub (one acre), and four were freshwater ponds (one acre). Zephyr identified no public water wetlands within the Project boundaries.[124]

132. An updated field delineation of the wetlands within the Project's temporary crane paths, staging/laydown yards, and intersection improvement areas will be completed. A wetland delineation report will be prepared and will be circulated to wetland agencies for review and approval prior to construction.[125]

133. Based on the current crane path layout, only minimal, if any, impacts to wetlands are anticipated. Minor, temporary impacts to wetlands may occur as a result of construction crane movements. Temporary placement of construction materials (e.g., timber mats, riprap, geotextile

[120] *Id.* at 54.
[121] *Id.*
[122] *Id.*
[123] *Id.*
[124] *Id.*
[125] *Id.* at 55.

fabric, temporary stabilizing materials, culverts) into any waterbody or wetland for purposes of temporary stream crossings, cofferdams, or storage sites may require coordination with the Army Corps of Engineers and Nobles County, administering Section 404 of the Clean Water Act and the Minnesota Wetland Conservation Act ("WCA"), respectively. Because all proposed impacts are temporary, any unavoidable fill activities are anticipated to qualify under Nationwide Permit 33 for temporary impacts and be eligible for a "no-loss" determination under the WCA. The MPCA administers the National Pollutant Discharge Elimination System ("NPDES") permit program in Minnesota and regulates construction activities that disturb more than one acre of land. As part of its NPDES permit application, an SWPPP will identify erosion and sedimentation control measures to prevent adverse water quality impacts to streams and wetlands during and after construction. Mitigation measures included in the SWPPP will ensure that surface waters within the Project area do not incur adverse construction-related stormwater impacts. Any additional BMPs that may be required due to the presence of special waters or impaired waters within one mile of the Project area will be adhered to.[126]

XII. Vegetation

134. Based on U.S. Geological Survey National Land Cover Database ("NLCD") data, about 86 percent of the Project area is cultivated cropland, six percent is herbaceous, six percent is developed open space, less than one percent is mixed forest, and one percent is emergent herbaceous wetlands.[127]

135. Pasture and grassland areas mostly occur along stream corridors and are scattered around the center of the Project area. Forested areas appear limited to areas around homesteads.[128]

136. Surveys completed in 2011 within the Project area did not identify native prairie, and therefore no impacts to native prairies were proposed. Because there were no impacts to native prairies when the Project was originally constructed, a prairie protection and management plan was not required or prepared. Similarly, impacts to native prairie will be avoided by the repowering process.[129]

137. The desktop mapping efforts were used to identify the presence of native prairie within the Project area. Zephyr took into consideration historical land use, publicly available Potentially Undisturbed Lands in southwestern Minnesota GIS data, MNDNR Native Plant Communities GIS data, Minnesota Biological Survey ("MBS") GIS data, and Conservation Reserve Program data to identify potential native prairie areas. Twelve Potentially Undisturbed Lands, classified as Prairie Coteau grasslands, were mapped within the Project area. It is possible that some or all of these contain prairie habitat. Disturbance areas will be fully reviewed for potential native prairie prior to construction work and a native prairie protection plan provided in accordance with the site permit amendment.[130]

[126] *Id.*
[127] *Id.*
[128] *Id.*
[129] *Id.* at 56.
[130] *Id.* at 59.

138. Zephyr intends to utilize the same crane paths for repowering that were used during the original construction, to the extent possible, to minimize impacts to vegetation. Proposed crane paths have been routed primarily on agricultural lands. Woodlands, shrublands, and grasslands will be avoided to the degree practicable. However, some minor, unavoidable impacts to these areas may occur. It is possible that these areas may contain native vegetation (i.e., plant species living in the area where it is found naturally vs. being introduced). If disturbed, Zephyr is committed to restoring and seeding these areas with certified weed-free mixes appropriate for the region. It is the intent of Zephyr to minimize impacts to non-cultivated, plant communities within the Project area.[131]

139. The Draft Site Permit contains several conditions related to vegetation. It requires Zephyr to minimize tree removal and preserve other vegetation to the maximum extent practicable.[132] Zephyr must also develop an Invasive Species Prevention Plan and take all reasonable precautions against the spread of noxious weeds during construction, including the selection of appropriate seed for vegetative cover.[133] The Draft Site Permit also requires any construction impacts to native prairie to be addressed in a prairie protection and management plan if native prairie is identified in the Project area.[134]

140. Zephyr completed a desktop and field inventory of proposed construction corridors for the presence of native prairies in September 2021. The field findings were summarized in a report and submitted to the MNDNR and EERA for review and comment. MNDNR staff reviewed the report and responded that they do not have any concerns regarding the results of the desktop and field inventory. The agency also indicated that because native prairie (as defined under Minn. Stat. § 84.02, subd. 5) has not been identified within the Project boundary, a prairie protection and management plan is not needed.[135]

141. With these mitigation measures in place, significant vegetation impacts are not expected.

XIII. Wildlife Resources

142. Wildlife species likely to occur within the Project area are typical of those found in agricultural dominated landscapes.[136]

143. There are no established Migratory Waterfowl Feeding and Resting Areas ("MWFRA") within Nobles County. The nearest MWFRAs (Heron Lake and South Heron Lake) are more than 24 miles east of the Project area in Jackson County.[137]

144. The proposed crane paths have been sited primarily in agricultural row-cropland; therefore, it is anticipated that repower activities will have minimal and temporary impacts on residential wildlife. Zephyr consulted with the USFWS and the MNDNR regarding any potential concerns or impacts to wildlife or habitats associated with the repowering of the Project. There are

[131] *Id.* at 56.
[132] Draft Site Permit at 5.3.10.
[133] *Id.* at 5.3.12; 5.3.13.
[134] *Id.* at 4.7.
[135] Zephyr Comment at 3.
[136] Application at 56.
[137] *Id.*

no known substantive changes to wildlife populations from those determined in the original site permit application.[138]

145. As construction activities associated with Project repowering will primarily be conducted within agricultural areas, impacts to wildlife or wildlife habitats are anticipated to be minimal.

146. The Project area is approximately 18.1 miles southwest of the Heron Lake Important Bird Area ("IBA") and 15 miles southeast of the Prairie Coteau Complex IBA. The Heron Lake IBA encompasses a variety of lakes, wetlands, and grasslands, 11 WMAs, four WPAs, and two county parks. Seventy-seven bird species have been documented in the Heron Lake IBA. The Prairie Coteau Complex IBA provides prairie, marsh, and grassland habitats for a variety of bird species. A total of 251 bird species are known to use the Prairie Coteau Complex IBA, including special status species (i.e., Species of Greatest Conservation Need, Species of Concern, and state-threatened or endangered species). Although the Project area is located between two IBAs, the Project has been operating for the past eight years with no known significant avian mortality events.

147. No wildlife impacts have been observed or reported by operations staff since Zephyr took ownership, and no impacts will occur to habitat within the IBAs. Consequently, impacts are not anticipated to either IBA as a result of repowering the Project.

XIV. Rare and Unique Natural Resources

148. The Project area was evaluated for the presence of federal- and state-listed species, their habitat, and the potential for the proposed repowering efforts to affect said species.[139]

149. Although records of special status species or habitats were not documented within the Project area, Zephyr will adhere to the BMPs (such as for Topeka shiner and Blanding's turtles) to avoid or minimize potential impacts to listed species and sensitive habitats (i.e., prairies) within or near the Project area.[140]

150. No change from the original application concerning impacts to rare or unique natural resources is anticipated during the repowering process. Zephyr is familiar with the BMPs associated with avoiding or minimizing impacts to listed species and their habitats, and to prairie habitat that may be on-site or nearby, as demonstrated during construction of the original Project in 2012. Zephyr intends to work closely with MNDNR and USFWS staff, as needed, to ensure rare and unique resources are avoided to the extent practicable.[141]

151. Areas indicated by the MNDNR as sensitive within the Project area will be avoided to the extent practicable. Impacts to wildlife and their habitats will be mitigated by: (1) siting temporary crane walks, pads, and laydown areas on cultivated agricultural land, when at all possible, (2) avoiding impacts to wetlands, streams, forested areas, shrublands, and native plant communities

[138] *Id.* at 57; Appendix E.
[139] Application at 57
[140] *Id.* at 59.
[141] *Id.* at 60.

to the extent practicable, and (3) following the recommendations for avoiding or minimizing impacts to potential Topeka shiner habitat.[142]

XV. Climate Change

152. Minnesota is taking action against climate change. Executive Order (19-37), signed in December 2019, created the Governor's Advisory Council to coordinate climate change mitigation and resilience strategies in Minnesota. The Executive Order describes climate change as an existential threat that impacts all Minnesotans and our ability to thrive.[143]

153. The Next Generation Energy Act of 2017 set statutory goals to reduce greenhouse gas emissions in the state by 30 percent of 2005 levels by 2025, and 80 percent by 2050. Minnesota fell short of its 2015 goal of 15 percent and is not on track to meet the 2025 goal.[144]

154. The Project will further the state's clean energy goals set forth by the Governor's Office by providing a renewable source of energy that will offset other greenhouse gas emissions, primarily from coal and natural gas. The existing wind farm is estimated to offset approximately 80,318 metric tons of carbon dioxide ("CO2") per year. With the repower, the offset is expected to increase to 95,436 metric tons of CO2, the equivalent of 105.2 million pounds of coal burned for one year.[145]

155. Additionally, the Project has been designed with resiliency in mind as our climate continues to change in Minnesota. Project equipment has been carefully engineered and selected to withstand the potential for an increase in the frequency of severe weather events, including low temperature operation and withstanding extreme wind gusts.[146]

156. The Vestas V110 turbines have been designed to withstand extreme weather events such as high wind speeds and cold temperatures. The repowered turbines will stop when wind speeds reach 21 m/s (69 f/s) and are built to operate within a standard temperature range from -20°C to 40°C (-4°F to 104°F).[147]

157. While wind turbines do not release emissions, a minor amount of emissions will be generated during construction when heavy equipment is moving around the site, but this will be a short-term increase in emissions. A small amount of emissions will be generated from vehicles used for maintenance and operations of the Project.[148]

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[142] *Id.*
[143] *Id.* at 61.
[144] *Id.*
[145] *Id.*
[146] *Id.*
[147] *Id.*
[148] *Id.*

XVI. Potential Cumulative Impacts

158. Cumulative impacts are combined, incremental effects of human activity. While an individual activity may be insignificant by itself, minor impacts in combination with other actions may cause a larger issue in a region or to an important resource.[149]

159. A review of MNDOT District 7 construction projects did not reveal any road projects proposed with similar timing and within close proximity to the Project area that would be expected to interact negatively or create significant cumulative impacts with the proposed project.[150]

160. According to Nobles County, several road projects are being planned for 2021 and 2022. The nearest road projects include mill and overlays on CSAH 7 between CSAH 18 to Murray County (about 7.5 miles northeast of the Project), and on CSAH 35 between Rock County and Worthington (about four miles south of the Project). Both projects are planned for 2022.[151]

161. Zephyr is not aware of any proposed residential or commercial development projects within the vicinity of the Project area.[152]

162. Zephyr is coordinating with Xcel Energy regarding its planned use of roadways for a similar repowering project at the adjacent Nobles Wind Farm. Zephyr is working with Xcel on sharing the roads and lease agreements between the two farms.[153]

XVII. Decommissioning, Turbine Abandonment, and Restoration

163. Zephyr estimates the service life of the Project after completion of repowering to be approximately 30 additional years.[154]

164. Zephyr estimates the total decommissioning cost would be approximately $1,233,000 ($82,200 per turbine) including a 10 percent (10%) contingency on the demolition costs and engineering/administration costs and crop loss. The salvage/scrap value of the turbines, transformers, and other materials is approximately $650,000, or $43,400 per turbine. Including resale and salvage values the net cost is approximately $583,000, or $38,800 per turbine.[155]

165. The Draft Site Permit contains several provisions relating to decommissioning and site restoration.

166. Section 11.1 of the Draft Site Permit requires Zephyr to submit a decommissioning plan to the Commission prior to the pre-construction meeting with updates every five years. The decommissioning plan will describe how Zephyr will provide for the resources that are necessary to

[149] *Id.*
[150] *Id.*
[151] *Id.*
[152] *Id.* at 62.
[153] *Id.*
[154] *Id.* at 72.
[155] *Id.*

properly decommission the Project at the appropriate time. This plan must also be submitted to the local unit of government with direct zoning authority over the Project.[156]

167. Zephry included a draft decommissioning plan with the Application.[157] EERA provided comments on the draft decommissioning plan on November 1, 2021. Zephyr has confirmed that they will address and incorporate EERA's comments in an updated plan to be filed prior to the pre-construction meeting.[158]

168. Section 11.2 of the Draft Site Permit requires removal of wind facilities to a depth of four feet and restoration and reclamation of the site to the extent feasible. All subsurface infrastructure will be removed to four feet below ground level and reclaimed as specified in the land leases, and all surface infrastructure will be removed and reclaimed to pre-construction conditions. Underground utility lines deeper than 48 inches below ground may be left in place to minimize land disturbance and associated impacts to future agricultural land use. Any agreement for removal of Project infrastructure to a depth of less than 48 inches, or no removal, will be recorded with the County and will show the locations of all such foundations.[159]

169. The Draft Site Permit contains appropriate conditions to ensure proper decommissioning of the Project.

XVIII. Permit Conditions

170. The Draft Site Permit contains numerous conditions and requirements that Zephyr must adhere to in the design, preparation, construction, operation, decommissioning, and restoration of the Project and Project area. Many of these conditions are discussed above.

~~171. The Draft Site Permit incorporates EERA's comments from the EERA Comment.~~

171. On January 7, 2022, Zephyr provided its suggested changes to the Draft Site Permit. Those changes include: (1) minor typographical and factual corrections, (2) clarifications to Section 2.0 (Project Description), Section 4.11 (Meteorological Towers), and Section 5.3.29 (Federal Aviation Administration Lighting), and (3) a request to waive the wind access buffer setback with respect to Turbines T-1, T-3, T-12, T-13, and T-14.

172. EERA recommends the request to waive the wind access buffer setbacks be included in section 6 of the site permit (Special Conditions) as follows:

6.2 Wind Access Buffer Waiver Requests

The Commission authorizes a variance of the wind access buffer setback for the following turbine locations: 5 turbines, including turbines: T-1, T-3, T-12, T-13, and T-14. These variances are granted on the condition that the permittee shall extend a final offer to the remaining landowners for the same amount and terms agreed to by other

[156] Draft Site Permit at Section 11.1.
[157] Application at Appendix M.
[158] Zephyr Comment at 3-5.
[159] Draft Site Permit at Section 11.2; Application at 72.

landowners in similar circumstances or their last offer, whichever is higher. At least 14 days before the preconstruction meeting, the permittee must make a compliance filing describing in detail the results of the negotiation.

173. EERA does not support Zephyr Wind's proposed edits to Section 5.3.29 of the Draft Site Permit. To EERA's understanding, if the Community Wind South Repower Project utilizes meteorological towers that are greater than 200 feet in height, they must, per FAA requirements, be lit. If they are lit, EERA believes that impacts from these light sources should be mitigated similarly to those from turbine tower lights. To EERA's reading of Minn. Stat. § 216F.084, nothing in the statute dictates a different lighting mitigation approach for meteorological towers and turbine towers.

Any of the above Findings more properly designated as Conclusions of Law are hereby adopted as such.

Based on these Findings of Fact, the Commission makes the following:

CONCLUSIONS OF LAW

1. The Commission has jurisdiction over the site permit amendment applied for by Zephyr for the proposed repowering of the Project pursuant to Minnesota Statutes Section 216F.04.

2. Zephyr has complied with the procedural requirements of Minnesota Statutes Chapter 216F and Minnesota Rules Chapter 7854.

3. The Commission has complied with all procedural requirements of Minnesota Statutes Chapter 216F and Minnesota Rules Chapter 7854.

4. A Public Information Meeting was conducted in a community near the proposed Project and second Public Information Meeting was held virtually. Proper notice of each Public Information Meeting was provided, and the public was given the opportunity to speak at the meetings and to submit written comments.

5. The Commission has the authority under Minnesota Statutes Section 216F.04 to place conditions in an LWECS site permit.

6. It is reasonable and appropriate to amend the Draft Site Permit to include the changes requested by Zephyr on January 7, 2022.

7. The Draft Site Permit contains a number of important mitigation measures and other reasonable conditions.

8. The Project, with the Draft Site Permit conditions revised as set forth above, satisfies the site permit criteria for an LWECS contained in Minnesota Statutes Section 216F.03 and meets all other applicable legal requirements.

9. The Project, with the permit conditions discussed above, does not present a potential for significant adverse environmental effects pursuant to the Minnesota Environmental Rights Act and the Minnesota Environmental Policy Act.

10. Any of the above Conclusions of Law more properly designated as Findings of Fact are hereby adopted as such.