Boone County Application for Conditional Use Permit (Commercial WECS Project)

Supplement

April 6, 2020

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A. WECS Project Overview

Great Pathfinder Wind, LLC ("Great Pathfinder" or "Applicant"), requests a Conditional Use Permit (CUP) from Boone County for up to 40 wind turbines and associated facilities comprising a portion of an up to 225 megawatt (MW) wind energy conversion system project ("Project") to be located in Boone and Hamilton Counties, Iowa. See Appendix 1 for a map of the Project area and Appendix 2 for potential turbine locations.

Great Pathfinder is a wholly owned indirect subsidiary of Apex Clean Energy Holdings, LLC (Apex). Great Pathfinder has worked with landowners within Boone and Hamilton Counties to secure wind energy lease agreements, underground collection easements, good neighbor agreements, and setback waivers for up to 78 turbine sites. The Project area includes 482 separate properties owned by approximately 263 landowners. The Applicant has secured a total of 171 easements/agreements as of the date of application. The Project for which a CUP is requested will consist of up to 74 wind turbine generators, which will be connected to the Project substation via an underground collection system. The Project substation will be located in Jackson Township along 120th Street between R Avenue and S Avenue and will be connected to the electrical grid at the ITC Doud Substation via an approximately 7.5-mile 161 kV overhead generation tie line, which will be reviewed by the Iowa Utilities Board in a franchise proceeding pursuant to Iowa Code chapter 478.

The Project will consist of the following facilities:

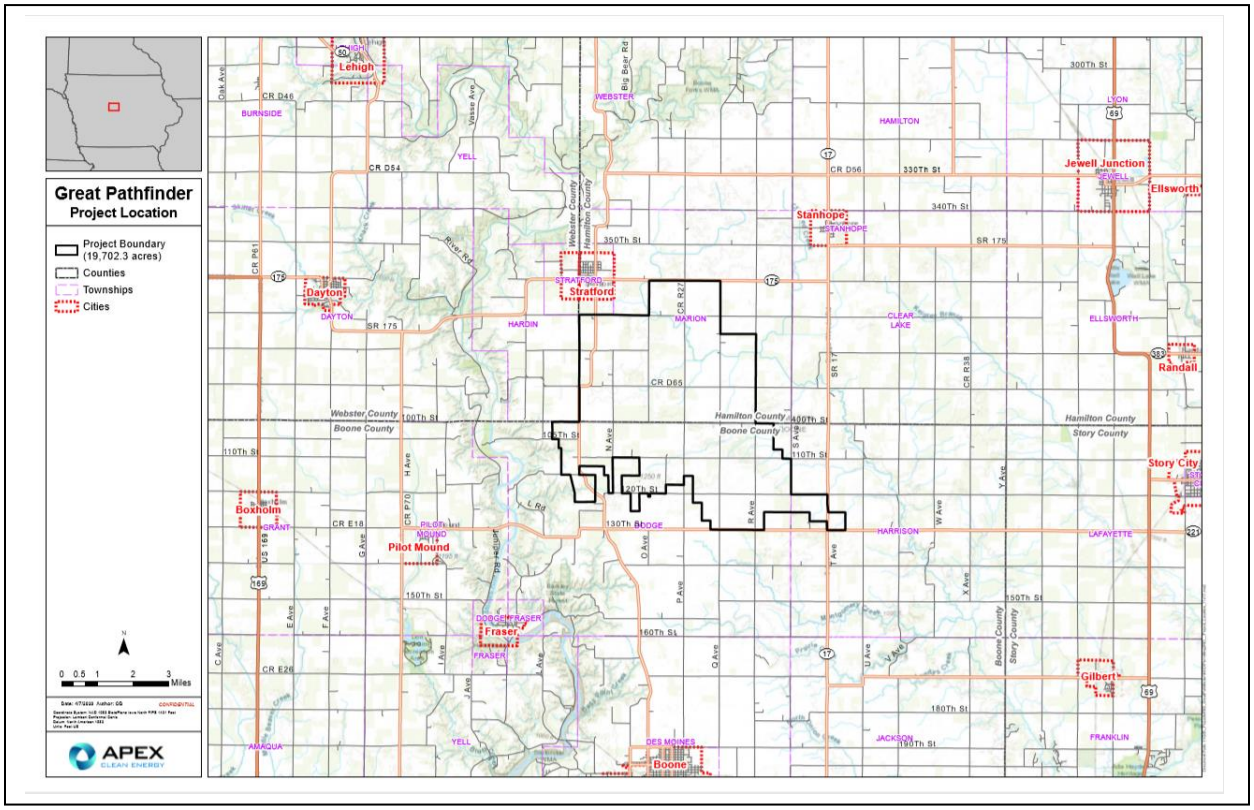
- Up to 74 wind turbine generators;
- Access roads to turbines and associated facilities;
- Underground 34.5 kV electrical collector lines connecting the turbines to the collection substation;
- Underground fiber-optic cable for turbine communications co-located with the collector lines;
- A 34.5 kV to 161 kV collection substation;
- Up to 2 permanent meteorological towers;
- An operations and maintenance (O&M) facility; and
- Additional temporary construction areas, including temporary parking and offices, an adjacent laydown yard, laydown areas adjacent to each turbine site, and a concrete batch plant.

The Project Area is set forth in Figure 1 below, and in Appendix 1 (Project Location) and 2 (Site Plan Overview). Table 1 below lists the Township, Range, and Sections in which the Project is located.

Table 1 – Project Location

County	Township Names	Township	Range	Section
Boone	Dodge	85 N	27 W	01
		85 N	26 W	02-06; 08-11; 13-14
	Harrison	85 N	25 W	17-18
Hamilton	Marion	86 N	26 W	15-16; 19-23; 26; 28-29; 31;33-34

Figure 1. Project Location

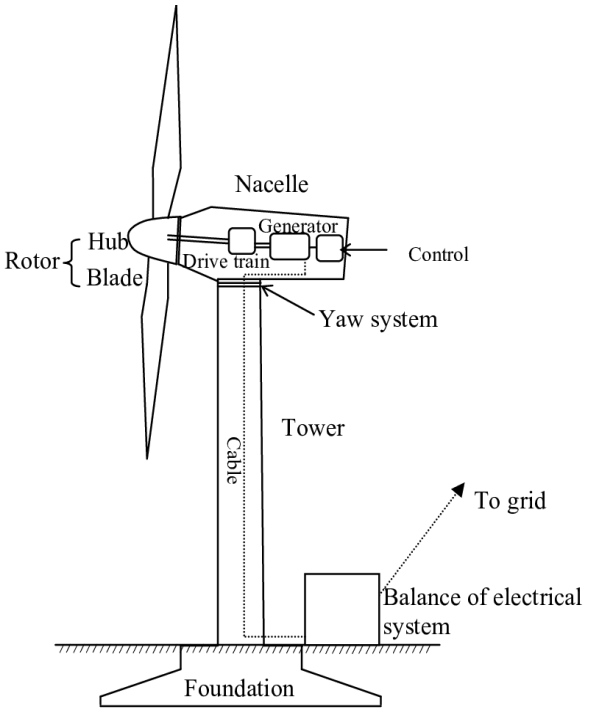


B. The Project

The portion of the Project to be located in Boone County will span across approximately 9,345 acres within Dodge and Harrison Townships. The Applicant is considering five turbine models in the 3.03 MW to 5 MW range with a maximum hub height of up to 105 meters (354 feet), a rotor diameter of up to 150 meters (492 feet), and a tip height of up to 182 meters (598 feet). The details regarding each of the turbine models under consideration are shown in Section V of this application supplement. A specific turbine model has not been selected at this time, but Applicant currently anticipates using Vestas V150 4.2 MW turbines, which have a hub height of 105 meters (344.5 feet), a rotor diameter of 150 meters (492.1 feet), and a tip height of 180 meters (590.6 feet). Appendix 2 shows anticipated primary and alternate turbine locations based on this turbine model.

Figure 2 is a representative diagram depicting the main components of a horizontal axis wind turbine being considered for the Project. The Applicant plans to select the most appropriate technology for the Project based on availability, optimization of wind and land resources, and cost. If the Applicant uses Vestas V150 4.2 MW turbines for the Project, the Applicant anticipates utilizing up to 33 proposed turbine locations in Boone County. Because the Vestas V150 4.2 MW turbine is the primary turbine model under consideration for the Project, all figures and appendices provided with this application are based on this turbine model. Should the Applicant elect to use one of the other turbine models listed in Table 5 of Section V, the Project would comply with all applicable ordinance requirements, including all requirements regarding setbacks and sound. The Applicant will also provide an updated setback map and acoustical analysis for the turbine model selected prior to construction to demonstrate compliance.

Figure 2: Main components of a horizontal axis wind turbine



Source: Albadi, Mohammed. (2010). On techno-economic evaluation of wind-based DG. PhD thesis.

The portion of the Project in Boone County for which a conditional use permit is sought will consist of the following WECS facilities:

- Up to 40 wind turbine generators,
- Access roads to turbines and associated facilities,
- Underground 34.5 kV electrical collector lines connecting the turbines to the collection substation,
- Underground fiber-optic cable for turbine communications co-located with the collector lines,
- A 34.5 kV to 161 kV collection substation,
- Up to 2 permanent meteorological towers,
- An operations and maintenance (O&M) facility,
- Additional temporary construction areas adjacent to each turbine location, and
- A concrete batch plant.

In addition to these facilities, the Applicant is currently seeking approval from the Iowa Utilities Board to construct an approximately 7.5-mile, 161 kV interconnection transmission line connecting the 161 kV collector substation for the Project to the electrical grid at the ITC Doud Substation.

C. Benefits of the Project

The primary objective of the Project is to harness the robust wind resources of central Iowa to generate and deliver renewable energy to the regional power grid, in order to:

- Meet regional energy needs in an efficient and environmentally sound manner by generating enough energy to power up to 85,230 U.S. homes, and
- Realize the full potential of the wind resource on the lands under lease.

During the 9-to-12-month construction period, Great Pathfinder Wind will employ approximately 270 temporary construction workers. During operation, the Project will employ approximately 9 full-time personnel as facility managers, site managers, and turbine technicians. Construction and operation of the Project will also inject millions of dollars into the local economy. These investments will be felt throughout the community, including but not limited to hotels, restaurants, gas stations, and grocery stores, as well as companies involved in auto repair, tire sales, drain tile repair, and road repair.

Over the expected 30-year life of the Project, the Project would generate over $69 million in direct economic benefits for local landowners, local employees, local communities, and Boone County, as shown in the table below. The table does not include indirect benefits such as local spending on O&M needs described in part in the preceding paragraph or induced economic benefits as salaries and landowner payments flow through the local economy.

Table 2 – Direct Economic Benefits of the Project

Payment Types	Direct Beneficiary	Approximate Total (30 Years)
Lease Payments	Project Landowners	$42,075,000
Wages	9 O&M Employees	$7,617,600
Taxes[1]	Boone County	$16,000,000
	Hamilton County	$3,783,734
Total		$69,810,507

In addition, the Project will generate significant property tax revenue for the benefit of the local community. The Applicant anticipates the Project will generate approximately 16 million in property tax revenues for Boone County over the life of the project, resulting in benefits to the community in terms of enhanced funding available for government programs and services, including schools based on the installed turbines in Boone County.

[1] The total tax assessment is based on up to 33 wind turbine generators to be located in Boone County and up to 7 in Hamilton County. The model assumed is the V150 5.6 MW.

D. Wind Project Development Overview

In 2017, the Applicant acquired the Project assets from Mint Consulting Inc. At the time of the acquisition, approximately 7,000 acres of land were under lease or easement. Because the Project was acquired after initial site selection, and a specific area was offered for sale, neither the Applicant nor Apex was involved in considering alternative locations outside of Boone and Hamilton Counties. The Applicant's interest in acquiring the Project was due to the high wind resource, available transmission capacity, and interest from the landowners within the area. Since acquisition of the Project, the Applicant has undertaken extensive development activities consisting of landowner outreach, easement acquisition, coordination with resource agencies, county outreach, design and refinement of the Project layout, and offtake marketing. As outlined in the table below, these activities have included detailed studies and surveys within the Project area and obtaining relevant agreements or certifications. Environmental and wildlife survey information collected to date has been used to inform siting of Project infrastructure to avoid or minimize potential impacts to cultural and wildlife resources. The Applicant has obtained land rights through voluntary wind energy easement agreements (wind leases) from the landowners within the Project boundary. See Appendix 8 for a list of participating landowners.

Table 3 – Status of Relevant Development Activities

Activity	Year Completed (if applicable)	Status
Property Impact Study	2020	Completed
Acoustical Study	2020	Completed
Decommissioning Plan	2020	Completed
Location of Known Communication Towers	2020	Completed
Road Use Agreement	-	To be obtained prior to construction
County Drainage Agreement	-	To be obtained prior to construction
Spill Prevention, Control, and Countermeasures (SPCC)	-	To be obtained prior to construction
Pre-construction Road Survey	-	To be obtained prior to construction
Radio Frequency Impact Study	2020	Completed
FAA Determinations of No Hazard	-	To be obtained prior to construction
Stormwater Pollution Prevention Plan (SWPPP)	-	To be obtained prior to construction
Utility Crossing Agreement	-	To be obtained prior to construction
Engineer's Turbine Certification	2019 (valid until 2024)	Completed
Sanitation Certificate for O&M Facility	-	To be obtained prior to construction
Wetland Delineation	2020	In progress, to be completed June 2020
Avian Use Surveys	2018–2019	Completed
Avian Use Surveys	2019–2020	In progress, to be completed March 2020
Raptor Nest Survey	2018–2020	Completed
Indiana Bat and Northern Long-Eared Bat Habitat Assessment	2019	Completed
Desktop Cultural Assessment	2020	Completed
Cultural Field Survey	2020	In progress, to be completed June 2020
Generation Interconnection Agreement (GIA)	2021	In Progress

E. Anticipated Project Construction Schedule

Construction of the Project will not begin until after the Applicant has obtained the requested CUP and any required building permits. Although the Applicant anticipates taking additional substantial actions in furtherance of the Project throughout the remainder of 2020 upon receiving the requested permit consistent with Section 5.10 of the Boone County Zoning Ordinance, the Applicant anticipates that major construction activity on the Project will begin in the fall of 2021 and conclude 12 to 15 months thereafter. Construction will be performed in several stages and will include the following elements:

- Grading of the field construction office and laydown area;
- Construction of site roads, turnaround areas, and crane pads at each wind turbine location;
- Construction of the turbine tower foundations and transformer pads;
- Installation of the underground electrical collection lines;
- Assembly and erection of the wind turbines;
- Construction and installation of the substation; and
- Site restoration work.

F. Applicant Description and Contact Information

The Applicant is a Delaware limited liability company and wholly owned indirect subsidiary of Apex Clean Energy Holdings, LLC (Apex). Apex is an independent renewable energy company headquartered in Charlottesville, Virginia. Apex has a diversified portfolio of renewable energy resources representing more than 17,000 MW of clean energy capacity. Apex has brought nearly 3,000 MW of renewable energy projects online since 2012, and Apex provides asset management services for over half of that capacity. Apex has one of the nation's largest, most diversified portfolios of renewable energy resources and has the experience, skills, personnel, and proven capability to successfully manage wind and solar project development. Apex offers comprehensive in-house capabilities, including site origination, permitting, financing, construction, and long-term asset management services. Apex also works with corporations, utilities, and government entities, including McDonald's, Facebook, Walmart, Starbucks, IKEA, DTE Energy, Xcel Energy, and the U.S. Army.

Through this experience, Apex has won numerous awards, including the American Wind Energy Association's 2018 and 2019 Safety and Health Gold Achievement Award, the Sustainable Purchasing Leadership Council's 2017 Business Case Award for providing energy security to U.S. Army Garrison Fort Hood in Texas, and the Wind Farm Team of the Year in 2017 for operations and management of the Kay Wind project in Oklahoma. A testament to the company's strong core values, the Hoopeston Wind and Cotton Plains Wind facilities, both developed and managed by Apex (in Vermilion County, Illinois, and Floyd County, Texas) each recently achieved 1,000 injury-free days. For an overview of Apex's mission, values, and top-notch team, please visit www.apexcleanenergy.com.

Applicant's address and telephone numbers are as follows:

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II. Conditional Use Criteria (Concept Plan)

By way of answering the specific questions listed on the Boone County CUP application form, this section of the application supplement sets forth a concept plan consistent with the instructions provided on the application form for a CUP. The answers to these questions address the requirements of Boone County Zoning Ordinance Section 5.06.

1. Is the proposed use listed as a Conditional Use in the Zoning District where your site is located?

Great Pathfinder facilities will be located within an A-1 Agricultural Conservation District in Boone County. As shown on the use table in Section 4.16 of the Boone County Zoning Ordinance, a wind farm may be permitted as a conditional use in the A-1 Agricultural Conversation Districts in Boone County. Section 4.04.03(12) of the Boone County Zoning Ordinance also recognizes that a CUP may be issued for a Commercial Wind Energy Conversion System to be located in an A-1 Agricultural Conservation District.

2. Explain how the characteristics of the site are suitable for the proposed use. Your explanation should consider the size, shape, location, topography, existence of improvements and natural features.

The Applicant seeks a CUP to construct and operate the Boone County portion of a wind energy conversion system with a nameplate capacity of approximately 225 MW in Boone and Hamilton Counties, Iowa. In Boone County, portions of the Project will be located in Dodge and Harrison Townships and roughly bounded by 130th Street to the South, 100th Street to the North, L Avenue to the West, and T Avenue to the East.

The characteristics of the proposed site are well-suited for the proposed use. The proposed Project will be located entirely on private land and has been sited to avoid natural features such as the Des Moines River (more than 1 mile to the West). The Project area is composed of approximately 19,743 acres of land, as shown in the following table of land cover data for the Project area gathered from the U.S. Geological Survey National Land Cover Database 2011 (Homer et al. 2015).

Table 4 – Land Cover Types and Composition in the Proposed Project Area

Land Cover Type	Acres	Percent Composition
Cultivated Crops	17441.4	88.34
Deciduous Forest	143.9	0.73
Developed	1015.0	5.14
Emergent Herbaceous Wetlands	41.6	0.21
Hay/Pasture	689.2	3.49
Herbaceous	387.9	1.96
Open Water	2.8	0.01
Woody Wetlands	21.4	0.11
Total*	**19743.2**	**100.00**

* Sums of values may not add up to total value shown due to rounding.

Of the approximately 19,743 acres of land within the Project boundary, approximately 16,000 acres has been leased, including approximately 8,833 acres in Boone County. Of the 8,833 acres leased in Boone County, an estimated maximum of 20 acres would be removed from production for project facilities (turbines and access roads).

The topography of the proposed Project area allows for strong, unimpeded wind resources and is suitable to support turbine foundations. A map showing topography of the Project area can be found in Appendix 4. According to the American Wind Energy Association, the U.S. Department of Energy, and the National Renewable Energy Laboratory, utility-scale wind power plants require minimum average wind speeds of 6 m/s (13 mph). The Project area has an optimum average wind speed of 7.86 m/s. The Project is proposed to host up to 40 wind turbines ranging in nameplate capacity from 3.03 to 5.6 MW in Boone County. The turbine model in the current site plan is the Vestas V150 4.2 MW turbine, but as noted elsewhere in this application supplement, the turbine model to be utilized for the Project has not been finally determined.

In addition to the Project's excellent wind resource and mostly open terrain, the public interest in clean, renewable energy has allowed the Applicant to obtain contiguous land via wind lease agreements throughout the Project area. Development of the Project will be governed by the Boone County Zoning Ordinance, which includes appropriate setback requirements to protect and preserve the human health and environment of the residing community. Each turbine and its associated access road will utilize approximately 0.25 to 0.50 acres of land with the access road comprising most of this acreage. A map showing setbacks and access roads is illustrated in Appendix 3.

The proposed Project location is also near existing transmission infrastructure. The Project substation will connect to the grid at the ITC Doud Substation, located East of Boone, via an approximately 7.5-mile-long 161 kV line generation tie line.

3. Will the proposed development generate additional automotive or pedestrian traffic? If yes, explain why and to what extent.

Yes. During construction, the Project will generate increased automotive and truck traffic within the Project area and its neighboring public roads. This temporary increased traffic volume is not anticipated to last longer than 12 months. The postconstruction phase of project development is not anticipated to generate significant ongoing automotive or pedestrian traffic. Prior to construction, the Applicant will work with the Boone County engineer to prepare a Road Use Agreement for the Project addressing the requirements consistent with Section 8.04.08(13) of the Boone County Zoning Ordinance.

The nature and extent of traffic anticipated to be generated by the Project is further discussed below.

3.1. Traffic During Construction

The 9-to-12-month construction phase of the Project requires the transportation of major equipment and constitutes the highest amount of construction traffic. U.S. Highway 30 and State Highway 17 will be the primary travel routes to the Project. As the primary access routes to the site, these roadways will likely have the greatest impact from the construction vehicles and workers. Other transportation corridors within the Project area include several roads under county or township jurisdiction. It is anticipated that the majority of the construction workforce traffic will originate from the surrounding area.

Various-sized trucks will be used to deliver construction equipment and materials. Some of these trucks may have a gross vehicle weight upward of 150,000 pounds. All use of oversize or overweight (OS/OW) vehicles will comply with state, county, and township requirements. Construction vehicles that will be used during the project include:

- Two 100-ton rough terrain cranes,
- Two 400-ton truck cranes,
- Rock trucks,
- Concrete trucks,
- Backhoes,
- Motor graders, and
- Various 18-wheelers for delivering supplies and equipment.

The wind turbines, towers, transformers, and other large equipment will be transported to the site using a semi truck and lowboy transporter designed for heavy loads (i.e., multiple axles). Appropriate permits will be obtained from the state and county for all deliveries of turbine components.

Construction activities will begin with site preparation, including the construction of site access entryways from public roads, rough grading of the roads, leveling the field construction site office parking area, and installing temporary site office trailers at the laydown area to be located in Hamilton County. The Project roads will be gravel-surfaced. Road construction will be performed in multiple passes starting with the rough grading and leveling of the roadway areas.

Many portions of the construction process will require the use of additional heavy equipment beyond the above list. For example, project road construction typically involves use of bulldozers, track-hoe excavators, front-end loaders, dump trucks, motor graders, water trucks, and rollers for compaction. Foundation work typically involves use of track-hoe excavators, drill rigs, front-end loaders, dump trucks, transportation trucks for materials, cranes and boom trucks for off-loading and assembly, compactors, concrete trucks, concrete pump trucks, backhoes, and small Bobcat-type loaders. Finally, electrical construction work typically involves use of track-hoe excavators, front-end loaders, trenchers, cable plows, transportation trucks for the materials, small cranes and boom trucks for off-loading and setting of pad transformers, concrete trucks, cable spool trucks used to un-spool cable, and a winch truck to pull cable from the spools onto the poles.

Construction-related traffic increases will consist of deliveries of Project equipment and construction materials (such as concrete and steel) by truck. Truck deliveries are anticipated to generally occur primarily between 7 a.m. and 5:30 p.m. on weekdays. Construction cleanup will require the use of a motor grader, dump trucks, front-end loaders, and light trucks for transportation of any waste materials, packaging, etc.

Movement of the transport trucks will have a short-term impact on traffic along designated roads throughout the Project area as escort vehicles, flag persons, and/or temporary traffic signals slow or stop traffic to allow the safe passage of the OS/OW vehicles. As existing traffic volumes do not appear to meet or exceed capacities, the roadways should not be significantly impacted by standard construction traffic or OS/OW load transport.

3.2. Traffic During Operation

Once construction is completed, the Project will operate continuously (24 hours per day, 365 days per year) using an automated system. There will be a minimum of 9 employees working full-time during operations out of an O&M facility that will be built within the Project area. Traffic between the O&M facility and the individual turbines will be minimal during operations, as scheduled maintenance will normally be performed only once every six months on each turbine. The Applicant will be responsible for the maintenance of turbine access roads, access ways, and other non-public roads built to facilitate the construction and operation of the Project. Routine turbine maintenance and repair usually involves a two-person maintenance crew working eight-hour shifts for two days, for a total of 32 man-hours per turbine. In rare instances, heavy maintenance equipment such as a lifting crane may need to be brought onto the site to replace a major turbine component such as a blade or gearbox.

During the operational phase, parking will primarily be located at the O&M facility parking lot. Including the anticipated operations workforce and occasional guests and delivery vehicles, no more than 25 vehicles are expected to be parked at the facility parking lot at any one time. Limited off-street parking will also be available at each turbine location for maintenance purposes.

4. Will the proposed development have adequate vehicular ingress (entry) and egress (exit) from a public right of way? If yes, identify the name of the public street or public road.

Yes, consistent with Section 5.06.01(3) of the Boone County Zoning Ordinance, the Project will have adequate vehicular ingress (entry) and egress (exit) from a public right of way to all of its facilities. Ingress and egress to each facility associated with the Project will be accomplished through the construction of private access roads.

In addition to using the existing public roads, the Applicant will construct a limited system of new, private access roads throughout the Project area. Proposed access road locations are shown in Appendix 2 and 3. These new access roads will be constructed between existing roadways and Project infrastructure and sited with the goal of minimizing their impact. The access roads will be gravel surfaced and generally will be 16 feet in width once the project is operational. During construction, some of the access roads will be widened to accommodate the movement of the construction vehicles, with temporary widths generally not to exceed 50 feet. The final access roads will be designed in consultation with the private landowners to maximize use of existing roads, minimize impacts to farming, and provide improvements where necessary and/or requested by the landowner. The Applicant will provide the final access road system to the County Engineers once completed.

Road access to the Project area is currently provided by a number of existing public roads, as shown in Appendix 2 and 3. Road design for the Project will minimize the overall disturbance footprint. In addition, several miles of existing roads will be improved during the construction phase of the Project.

Temporary crane paths will be required for the turbine erection cranes to travel between wind turbine sites. Following the completion of construction, these temporary crane paths will be removed, and the area will be restored to its prior condition to the extent practicable.

As required by the Boone County Zoning Ordinance and previously noted in this application supplement, the Applicant will satisfy all requirements of Section 8.04.08(13) in using public roads and will enter into a Road Use Agreement approved by the County Engineer and Boone County Board of Supervisors prior to construction.

5. Explain how the proposed development will manage vehicular and pedestrian safety and convenience, traffic flow, parking, control, emergency access, and loading and unloading?

Safety will be a top priority during all aspects of construction activities, especially on public roads. Pursuant to Section 5.06.01(4) of the Boone County Zoning Ordinance, the Project will provide off-street parking and loading areas, adequate service entrances and areas for all anticipated traffic, and appropriate screening around parking and service areas to minimize visual impacts, glare from headlights, noise, fumes, and any other detrimental impacts. Off-street parking will be available at each turbine constructed and will be used when maintenance is required, which will be infrequent. No public roads will be used for loading and unloading of materials and equipment. Turbine locations will be connected through the new private access roads constructed throughout the Project area, and the Applicant will reserve non-exclusive easements providing for unobstructed vehicular and pedestrian ingress and egress to and from all Project facilities. The adjacent agricultural use will provide appropriate screening for all parking and service areas and minimize visual impacts and any glare, noise, fumes, or other detrimental impacts associated with such maintenance.

Pursuant to Section 5.06.01(3) of the Boone County Zoning Ordinance, the new private access roads will provide adequate ingress and egress to all project facilities. Pedestrian safety and convenience are not anticipated to be impacted by the proposed Project because the turbines will be located in agricultural areas where pedestrian traffic is limited. In addition, the turbines will be

placed more than 1 times their height away from all public road right of ways. Emergency access to all Project facilities will be provided via access roads.

Pursuant to Section 5.06.01(5) of the Boone County Zoning Ordinance, signage complying with all applicable regulations and compatible with the immediate vicinity shall be used throughout the Project and exterior lighting shall be provided with consideration given to glare, traffic safety, and compatibility with property in the immediate vicinity. In accordance with Section 8.04.08(2), signs will be posted on the towers, transformer, and substation warning of high voltage and providing emergency contact information. Signs will also be posted at the entrance for each private access road to the wind turbines that includes identifying turbine information, a no-trespassing warning, and 911 information designated by the county. Proposed access road locations are shown in the site plan overview map in Appendix 2.

In addition to that mentioned above, during construction the Project will utilize a temporary 10-acre laydown area in Hamilton County. The temporary laydown area will provide a location to park vehicles, a location for office trailers, and a storage and staging area for construction materials and equipment. The proposed location of the temporary laydown area is shown on the site plan overview map in in Appendix 2.

After necessary permits are obtained, the O&M facility for the Project will be constructed in an A-1 Agricultural Conservation District in Boone County. The O&M facility will include a building that will store spare parts and serve as an office space for operational activities and a parking lot that will provide space for parking vehicles following construction during the operational phase of the Project. The agricultural use in the surrounding area will provide appropriate screening. Traffic between the O&M facility and the individual turbines will be minimal during operations, as scheduled maintenance is normally performed only every six months on each turbine. With the anticipated operations workforce, plus occasional guests and delivery vehicles, no more than 25 vehicles are expected to be parked at the O&M facility parking lot at any one time. The operations and maintenance workforce and third-party contractors will also receive regular emergency response and safety training to ensure that effective actions are taken to reduce and limit the impact of any emergency at the Project site.

6. Describe the local character of the surrounding area where the proposed use or structure will be located.

The Project will be located on a ridge, allowing for wind from the dominant direction (southeast) to reach the facilities unimpeded. This location, coupled with the lack of vegetation in the area, is especially conducive to wind farm development. The relief or topography within the Project area will range from near-flat to moderate slopes.

All the proposed facilities located in Boone County, including the wind turbines, access roads, temporary laydown area, underground collection cables, and O&M facility will be located within A-1 Agricultural Conservation Districts. Most of the land within A-1 Agricultural Conservation Districts within Boone County is agricultural land used primarily for crop production. Corn and soybeans are the dominant crops in the area. Agricultural storage is second to farming in the area and includes silos and bins, livestock or mechanical storage, and vacant farmlands. Several rural residences or farmsteads are scattered throughout the local area near county, township, or public roads.

7. Explain how the proposed building or use is compatible with the local character of the zoning district and immediate vicinity?

The Project facilities in Boone County will be located within A-1 Agricultural Conservation Districts. Section 8.04.03 of the Boone County Zoning Ordinance provides that commercial wind energy conversion systems shall be permitted as a conditional use in any district where the use is listed and allowed. Section 4.04.03(12) expressly allows commercial wind energy conversion systems as conditional uses in A-1 Agricultural Conservation Districts.

The primary current use of land within the Project area is growing corn and soybeans, followed by agricultural storage and residential uses. The Project will neither impede the character of the zoning district or the surrounding land nor diminish or adversely impact the ability to farm the land near the project facilities. Each wind turbine and access road will utilize only approximately 0.25 to 0.50 acres of agricultural land, and the access road to each turbine will comprise most of this acreage. Farmers will be able to continue to farm the land within the immediate vicinity. Farmers will also be able to use the private access roads to rest their vehicles during farming practices.

Consistent with Section 5.06.01(1) of the Boone County Zoning Ordinance, the proposed Project will be entirely compatible with and support the character of the surrounding area by allowing agricultural uses to continue while providing farmers consistent income that will ensure they are able to withstand years when yields are poor or commodity prices are low. More broadly, the steady source of income the Project provides to landowners who host wind turbine sites will increase and diversify overall income in the area and help ensure the continued viability of the agricultural character of the land. In addition, the community will benefit economically from the property tax payments, local jobs, and local spending associated with the Project. The Project layout will be designed to minimize impacts to the inherent rural character of the surrounding area. Noise generated by the turbines will not exceed 50 dBA at the nearest structure or use. The Project is designed to prevent shadow flicker from exceeding 40 hours per year on non-participating occupied structures within the Project area. No wind turbines will be placed within 1,250 feet of any residential building or business as measured from the outside wall. Land lease agreements and wind easement agreements will be voluntary, and participating landowners will receive agreed-upon fair compensation throughout the life of the Project. In addition, a voluntary purchase option agreement has been signed for the substation and O&M facility.

Consistent with Section 5.06.02(2) of the Boone County Zoning Ordinance, the proposed facilities installed are not anticipated to impair the adequacy of the quality or quantity of light and air on surrounding properties. During construction of the Project, the use and operation of construction equipment and vehicles will result in minor air emissions. The primary types of air emissions expected during construction are those typically associated with internal combustion engines (e.g. carbon dioxide, nitrogen oxides, sulfur oxides, carbon monoxide, and particulate matter). All construction and operations vehicles and equipment will comply with all applicable state and federal emissions standards. Though construction is exempt from air permits, the Applicant will instruct contractors to minimize engine idling and will encourage carpooling among construction workers to minimize emissions. The Project will employ reasonable precautions to prevent fugitive dust from becoming airborne and shall maintain and operate equipment in a manner that minimizes emissions. Air emissions displaced by the Project's operation will outweigh any air emissions generated during construction by several orders of magnitude, as the Project will generate power that would otherwise need to be generated by a fossil-fuel power plant upon its operation.

8. Explain how the proposed use will not substantially limit, impair, or preclude the use of surrounding properties for the primary uses listed in the Zoning District?

Construction of the Project will not significantly affect land use in the Project area. Major land uses, including crop production, livestock grazing, and agricultural storage, will continue in the areas around the turbines. Individual turbines will be sited to avoid cemeteries, environmentally sensitive areas, and any areas incompatible with wind energy production. The adjacent agricultural use surrounding the proposed facilities, which will be constructed in accordance with all setbacks and other requirements set forth in the Boone County Zoning Ordinance, will provide a natural buffer between the facilities, adjacent properties, and sensitive areas such as rural houses and protected prairie lands. All the proposed facilities will be properly sited to avoid interference with the development and use of adjacent properties.

Less than 20 acres of land within the Project area will be converted for development of turbine pads and access roads; the remainder will continue to be dedicated to current uses, such as crop production or grazing. Crops can be grown and livestock grazed right up to the base of turbine foundations, and turbines do not interfere with daily agricultural operations.

Each wind turbine and its adjacent access road will typically require less than half an acre of land. The Applicant has entered into approximately 103 50-year wind energy leases and easements in Boone County. Of the approximately 8,833 acres under lease for the Project in Boone, a maximum of approximately 400 acres (typically 10 acres per turbine) will be impacted during construction of the Project, with approximately 10 to 20 acres taken out of crop production to accommodate permanent facilities associated with the Project, including the all-weather gravel roads, substation, switch yard, and turbines. The development of the private access road system for the Project will be coordinated with landowners to minimize agricultural impacts.

In addition to land lease and wind easement agreements, underground collection easements have been signed by several landowners who were only interested in hosting underground facilities on their land. Furthermore, good neighbor agreements have been and will continue to be offered to landowners who are not interested in hosting facilities or providing access on their land but who own homes within half a mile of a proposed turbine location. Like the lease and easement agreements, these agreements pay a consistent annual income to landowners.

Per the terms of the wind and underground collection easements, the Applicant will compensate landowners for all crops lost or destroyed during construction. The Applicant will also employ a qualified contractor to make commercially reasonable repairs (including replacement, as necessary) to drainage tile damaged by construction or operation of the Project consistent with the drainage tile agreement with the county engineers. The Applicant will compensate landowners for crops damaged by floods resulting from broken drainage tile. Underground electrical wires and cables shall be installed with a trencher to a depth not less than 36 inches below the natural surface of the ground and below any existing drainage tile. In addition, consistent with Section 8.04.08(14) of the Boone County Zoning Ordinance, the Applicant will be responsible for the immediate repair of damage to public drainage systems stemming from construction, operation, or maintenance of the Project facilities. The Applicant will work with the Boone County engineer to enter into a Drainage Agreement for the Project prior to construction.

Consistent with Section 5.06.02(4) of the Boone County Zoning Ordinance, the Project is not anticipated to diminish or impair established property values of adjoining or surrounding

properties. The Applicant hired MaRous & Company, a real estate consulting firm with extensive experience conducting market analyses of a variety of energy projects in the Midwest, as well as residential, commercial, and industrial developments and recreational use sites, to prepare a property value impact report for the Project. The purpose of the report was to analyze the anticipated impact, if any, on the value of the surrounding properties resulting from the proposed wind farm. MaRous & Company determined that the Project would not have a negative impact on the value of the surrounding rural residential or agricultural property, and the report reflecting that analysis is provided in Appendix 14. As stated in the executive summary, Mr. Michael MaRous, an Appraisal Institute member, concluded that:

"As a result of the market impact analysis undertaken, I concluded that there is no market data indicating the project will have a negative impact on either rural residential or agricultural property values in the surrounding area. Further, market data from Iowa supports the conclusion that the project will not have a negative impact on rural residential or agricultural property values in the surrounding area. Finally, for agricultural properties that host turbines, the additional income from the wind lease may increase the value and marketability of those properties."

In addition, an independent study performed by the Berkeley National Laboratory for the U.S. Department of Energy analyzing several project locations in Iowa and surrounding states concluded that the presence of wind farms has no statistical impact on neighboring property values (Hoen et al., 2015). "The data for the study were collected from more than 50,000 home sales in 27 counties in nine states, including Iowa. The homes were within 10 miles of 67 different then-current or existing wind facilities, with 1,198 sales that were within 1 mile of a turbine (331 of which were within a half mile)" (Hoen et al., 2015). The report concluded that "Across all model specifications, we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post-announcement/preconstruction periods (Hoen et al., 2015).[2]

In accordance with Section 8.04.08(10), a decommissioning plan for the Project is provided in Appendix 13. The plan provides that the Applicant will be responsible for removing all Project facilities but will also establish security acceptable to Boone County in an amount intended to cover at least 110% of the cost of removal of the Project facilities at the end of their serviceable life or upon discontinuation of use. The anticipated life of the Project is 30 to 50 years; the landowner agreements provide for 30-year terms with two optional 10-year extensions. Upon the discontinuation of use, the facilities will be removed to ground level.

9. If applicable, describe the type of advertising signage and exterior lighting that will be erected with the proposed development? Describe the sign and how this sign will comply with Boone County's zoning regulation on signage.

Consistent with the requirements of Section 5.06.01(5) of the Boone County Zoning Ordinance, all signage posted on Project facilities will comply with all applicable regulations and be compatible with the immediate vicinity. In accordance with Section 8.04.08(2), signs will be posted on the towers, transformer, and substation warning of high voltage and providing 24/7 emergency

[2] Ben Hoen, Jason Brown, Thomas Jackson, Mark Thayer, Ryan Wiser, and Peter Cappers, "Spatial Hedonic Analysis of the Effects of US Wind Energy Facilities on Surrounding Property Values," *Journal of Real Estate Finance and Economics* 51, no. 1 (2015), https://ssrn.com/abstract=2611199.

contact information. Additional signage will be posted at the entrance for each private access road to the wind turbines that includes identifying turbine information, a no-trespassing warning, and 911 information designated by the county.

Consistent with the requirements of Section 5.06.01(5) of the Boone County Zoning Ordinance, exterior lighting shall be provided at the Project facilities with consideration given to glare, traffic safety, and compatibility with property in the immediate vicinity. In accordance with Section 8.04.08(6) of the Boone County Zoning Ordinance, red strobe lights will be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds, and red pulsating incandescent lights will be avoided. In addition, all lighting, including intensity and frequency of strobe, will adhere to but not exceed requirements established by the applicable FAA permits and regulations.

During operations, the Project will use up to two permanent meteorological towers: one permanent self-supporting (non-guyed) lattice tower and one temporary guyed lattice tower. Both permanent and temporary towers will be used for power performance testing (PPT), which usually lasts about 1 year. Upon completion of the PPT, the guyed lattice tower will be removed. The self-supporting tower will remain in place and will be used to collect data critical for daily wind farm operations. Each tower location will be individually studied by the FAA. The Project will comply with all paint and lighting requirements issued by the FAA.

The substation will be equipped with nighttime lighting systems to provide personnel with illumination for operation under normal conditions and for egress under emergency conditions. Emergency lighting with backup power will allow personnel to perform manual operations during an outage of normal power sources.

10. Explain how any exterior lighting erected on the proposed development will deal with the issue of glare, traffic safety and compatibility with property in the immediate vicinity?

Consistent with Section 5.06.01(5) of the Boone County Zoning Ordinance, appropriate impact minimization and avoidance measures will be taken throughout the life cycle of the Project to address the issues of glare, traffic safety, and compatibility with property in the immediate vicinity. Except as required by the FAA and detailed below, the Project is not expected to include exterior lighting that would cause glare, hinder traffic safety, or be incompatible with the property in the immediate vicinity. To the extent that exterior lighting is required, reasonable mitigation measures, such as minimizing exterior lighting, installing downward-projecting or motion-sensor-activated lights, and/or other measures suggested by Boone County, will be used during construction and operations. Prior to construction, as part of the FAA's obstacle evaluation process, the Applicant will seek FAA approval of a lighting plan.

As previously noted, consistent with Section 8.04.08(6) of the Boone County Zoning Ordinance, red strobe lights will be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds, and red pulsating incandescent lights will be avoided. In addition, all lighting, including intensity and frequency of strobe, will adhere to but not exceed requirements established by the applicable FAA permits and regulations. According to the FAA Advisory Circular, not every turbine is required to be lit, and lighting is only required at nighttime. Reduced lighting will minimize the nighttime visual impact of the Project to residents in the vicinity, and intermittent lighting will be synchronized to minimize the visual impact. Red lights will be placed as high as possible on

the turbine nacelles so that the lighting will be visible from 360 degrees. Additionally, the substation will be equipped with nighttime lighting systems to provide personnel with illumination for operation under normal conditions and for egress under emergency conditions. Emergency lighting with backup power will allow personnel to perform manual operations during an outage of normal power sources.

11. Explain how the proposed development satisfies the goals and policies of the Boone County Comprehensive Plan.

The proposed Project will satisfy many goals and policies expressed in the Boone County Comprehensive Plan (Plan).

First, the proposed Project is consistent with the expressed purpose of the Plan "to promote orderly growth and development for the county and its communities for the next twenty years." Through the development of this renewable energy project, Boone County will help address Iowa's growing electricity demand with clean, homegrown energy while diversifying the local economy and supporting jobs in the local community throughout the life of the Project. The Project promises to bring sustained tax revenue to the county for the local government and schools, as well as local purchasing, employment, and investments. Participating landowners will receive annual payments throughout the life of the Project, injecting tens of millions of dollars into the local economy to support merchants, contractors, equipment suppliers, auto dealers, and others.

Second, power generated by the proposed Project will be delivered into the Iowa electrical grid, reducing the need to import electricity from outside markets while supporting sustained agricultural production throughout Boone County. Moreover, development of the proposed Project is consistent with the industrial development policy stated in Section 1.4.8 of the Plan to "encourage industrial development which bases its products on renewable and indigenous raw materials." Wind is a clean source of energy and is ever-present throughout the Project area, which as previously noted in this application supplement is particularly well-suited to wind development.

Third, the proposed Project is likewise consistent with stated policy expressed in Section 5.7 of the Plan to "encourage economic development projects which do not conflict with the agricultural character of the county." The proposed Project will take less than 20 acres of agricultural land for the development of turbine pads and private access roads, while the remainder will continue to be used for agricultural purposes, including crop production and livestock grazing right up to the base of the turbine foundations. The proposed turbines will not interfere with agricultural operations throughout the Project area. The proposed Project will also support the agricultural character of the county by providing farmers with consistent income, helping to ensure the future of farms throughout the area for years to come.

Fourth, the proposed Project supports the water resource policy expressed in Section 4.7 of the Plan, which prefers "land use management practices and nonstructural solutions to problems of erosion and flooding" over structural solutions. Appropriate best management practices will be employed during and after construction of the Project to preserve and protect the natural integrity of soil and water flow affecting regular agricultural practices within the Project area and adjacent areas.

Finally, the proposed Project will support the transportation policies expressed in the Plan. As noted previously, the Applicant will work with the Boone County engineer to enter into a Road

Use Agreement for the Project prior to construction and will meet all requirements set forth in Section 8.04.08(13) of the Boone County Zoning Ordinance. Consistent with Section 8.2 of the Plan, the road use agreement will give due consideration to the carrying capacity of the existing road system in the area. Access roads will be constructed to mitigate additional traffic loads on county roads and appropriate right-of-way permits shall be obtained, consistent with the policy expressed in Section 8.4 of the Plan providing that "right-of-way and pavements shall be sufficiently wide and of sufficient strength to accommodate anticipated future traffic loads."

12. Is the proposed use located in the flood plain? If so, explain to what extent.

Based on the FEMA 100-year floodplain data for Boone County, designated floodplain areas do occur within the larger Project boundary, generally associated with existing watercourses. The floodplain maps are identified in Appendix 6. However, the Applicant does not anticipate citing any turbines within a designated floodplain, and neither the substation nor the O&M facility will be located in a designated floodplain. It is anticipated that some underground electrical and collection line cables could be located in a designated floodplain area, but because such cables will be located underground, the floodplain will not be altered, and the natural contours of the land will be restored as construction progresses. Therefore, the Project would not increase the risk of flooding. Moreover, the Applicant will comply with all state and federal permitting requirements with respect to any Project facilities to be located in a designated floodplain.

13. Will the well and septic tank system meet the minimum requirements of the proposed use or structure? Explain.

The proposed Project will only require a well or septic system for the O&M facility. No other facilities constructed will require a well or septic system. The Applicant will install a new septic system for sanitary needs at the O&M facility in accordance with all county requirements and obtain the necessary septic permit from the Boone County sanitarian. The verification from the county sanitarian is attached in Appendix 15.

Consistent with Section 8.04.08(9) of the Boone County Zoning Ordinance, all solid and hazardous wastes (if any) generated by the Project, including but not limited to crates, packaging materials, and damaged or worn parts, as well as used oils and lubricants, shall be removed from the Project area promptly and disposed of in accordance with all applicable local, state, and federal regulations. The primary waste generated by the proposed Project operations will be municipal solid waste generated at the O&M facility consisting of typical office wastes (paper, cardboard, food waste, etc.). This waste will be stored in a dumpster until it is collected by the local solid waste collection service provider. Small quantities of additional waste will result from the periodic changing of lubricating oils and hydraulic fluids used in the individual wind turbine generators. The changing of these fluids will occur infrequently on an individual turbine basis. These waste fluids will be stored for short periods of time in appropriate containers at the O&M facility for collection by a licensed collection service for recycling or disposal. It is not anticipated that the construction, operation, or maintenance of the Project will result in the generation of any hazardous wastes.

14. Is the proposed use located within an environmentally sensitive area? Explain.

Pursuant to Section 5.06.01(6) of the Boone County Zoning Ordinance, the Project will be planned and operated in such a manner that will safeguard environmental and visual resources. In accordance with the United States Fish and Wildlife Service (USFWS) Wind Energy Guidelines for Land-based Wind, the Project has been sited to avoid environmentally sensitive areas. Specifically, there is limited treed/wooded habitat and no significant wetlands or waterbodies or other unique topographical features that would concentrate avian wildlife species, specifically birds and bats. In addition, the Project has been sited to avoid all state and federal protected lands, Audubon Important Bird Areas, and Wildlife Management Areas. No protected lands located in Boone County are located within one mile of the Project area. The Masterson Wildlife Area and Bjorkboda Marsh are the closest conservation areas; they are located east of the Project area in Hamilton County, more than one mile from any proposed Project facilities. The predominant land cover/use types within the Project area include cultivated crops, developed/open space, and hay/pasture, which offer limited nesting habitat for birds. Additionally, the Project has been sited away from rivers and creeks that provide more suitable nesting and foraging riparian habitat (e.g., Des Moines River is over 1.4 miles from the nearest wind turbine).

The Applicant has been coordinating with USFWS and the Iowa Department of Natural Resources since it acquired the Project to identify potentially sensitive areas and/or species that may occur within the Project area. Based on agency feedback, a site-specific study plan was designed for the project area, which included raptor nest surveys, avian use surveys, and habitat assessments for listed bats. USFWS confirmed that there is no critical habitat for Topeka shiner (a federally endangered fish species) within the Project area and potential impacts to this species will be avoided/minimized through design (i.e., avoidance of direct stream impacts) and erosion and sedimentation control measures (i.e., adherence to a stormwater pollution prevention plan (SWPPP)). USFWS also confirmed there is limited native prairie and sedge meadow habitat within the Project area for the prairie bush clover and western prairie fringed orchid (both federally threatened plant species) to occur.

Raptor nest surveys were completed in 2018, 2019, and 2020 and confirm there is limited suitable raptor habitat in the Project area. More suitable habitat for nesting raptors and eagles is located within wooded riparian features, such as along the Des Moines River. The nearest occupied bald eagle nest to the Project is approximately 1.6 miles to the northeast along the Squaw Creek. It is unlikely that this nesting pair will be affected by the construction or operation of the wind Project as discussed and agreed upon with USFWS.

Although multiple studies and scientific papers have shown bird populations are not negatively impacted by wind projects, avian surveys were initiated in April 2018 to identify use of the Project area by birds, specifically eagles and other sensitive species (defined as species afforded protection under the Endangered Species Act of 1973, listed as threatened or endangered by the state, or listed as birds of particular concern identified in the 2019 USFWS Information for Planning, and Consultation Report). To date, only six bald eagles and two birds of a sensitive species (a bobolink, a USFWS bird of particular concern, and a northern harrier, a state endangered species) have been documented onsite in more than 430 hours of surveys, suggesting the Project area is low risk to eagles and other sensitive species.

The Project area is within range of both the Indiana bat and northern long-eared bat (both federally threatened species). Potential risk to sensitive bats has been minimized by mapping suitable

habitat for both species and implementing a 1,000-foot turbine setback from these areas. To further minimize risk to these species during fall migration, the Project has committed to curtailing turbines from August 1 to October 15 when bats are most active in accordance with USFWS recommendations.

The Applicant is aware that an area known as the Meskwaki Camp was located within areas of Boone County, portions of which may have occurred within the Project boundary. To identify cultural resource sites that may occur within this area, the Applicant will survey such areas where proposed facilities intersect with the Meskawaki Camp. Based on the results of the surveys, the Applicant will take measures to minimize, mitigate or avoid impacts to identified cultural resources.

Consistent with Section 5.06.01(6) of the Boone County Zoning Ordinance, the proposed Project facilities will not generate excessive noise, vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable hazardous or nuisance conditions, including weeds. With respect to noise, pursuant to Section 8.04.08(11), the noise level generated by the Project facilities will not exceed 50 dBA at the nearest structure or use. An acoustical analysis completed by HDR Engineering, Inc. is provided in Appendix 10. The analysis indicates that sound modeling confirmed the proposed turbine locations are appropriately sited to maintain the sound levels required by the Boone County Ordinance.

15. Explain how you intend to minimize any erosion, sedimentation, and land disturbance during the pre-during-post phases of construction.

The Applicant will identify site-specific best management practices to minimize erosion, sedimentation, and land disturbance during the pre- and postconstruction phases of the proposed Project. These practices will address construction plans for the site slopes, construction activities, weather conditions, and vegetative buffers. The sequence and methods of construction activities will be controlled to limit erosion. Clearing, excavation, and grading will be limited to the minimum areas necessary for efficient construction of the Project. Surface protection measures, such as erosion control blankets or straw matting, will be utilized as required prior to final disturbance and restoration if potential for erosion is high.

All construction practices will emphasize erosion control over sediment control through such non-quantitative activities as:

- Straw mulching and vegetating disturbed surfaces,
- Retaining original vegetation wherever possible,
- Directing surface runoff away from denuded areas,
- Keeping runoff velocities low through minimization of slope steepness and length, and
- Providing and maintaining stabilized construction entrances.

Materials, methods, and approaches to be implemented for effective stormwater pollution prevention and erosion control include the following:

- Conducting rain level monitoring,
- Mulching,
- Utilizing gravel tracking pads,

- Installing silt fence sediment barriers,
- Checking structures and sediment traps, and
- Using matting and erosion-control blankets.

In addition, the permanent parking area at the O&M facility will be graveled to minimize dust and soil erosion.

To avoid impacts to water quality, best management practices will be implemented to minimize the risk of erosion and downstream sedimentation in accordance with the Project's Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will be designed to meet the requirements of the Iowa Department of Natural Resources and Boone County. The SWPPP will include both structural and non-structural best management practices. Structural best management practices utilized for the Project may include the installation of silt fences and/or other physical controls to divert flows from exposed soils, or otherwise limit runoff and pollutants from exposed areas of the site. Examples of non-structural best management practices to be utilized include the implementation of materials handling, disposal requirements, and spill prevention methods. In general, the proposed turbines, access roads, underground cables, and other supporting infrastructure will not be located in wetlands or watercourses. The site construction plans will include detailed provisions and specifications to minimize erosion and storm water pollution.

In addition, the Applicant will obtain a National Pollutant Discharge Elimination System (NPDES) General Permit No. 2 addressing stormwater discharge associated with construction activities from the Iowa Department of Natural Resources. The Applicant does not anticipate any detention ponds will be necessary in light of the measures it is taking to avoid water runoff and therefore does not intend to build any detention ponds at this time. However, should any unforeseen runoff issues arise, the Applicant will take necessary measures and/or work with the county to address them.

The applicant will develop and implement Spill Prevention, Control, and Countermeasures (SPCC) during the construction and operation phase of the Project. The intent of the SPCC is to prevent the spillage of oil in surface water or groundwater.

16. Would you be willing to build a detention pond to control water runoff on the site? If not, then would you be willing to consider another type of water runoff control measure on the site?

As noted in the answer to the previous question, the Applicant does not believe a detention pond is necessary to control water runoff on the proposed Project site. The majority of the proposed Project facilities will not include impervious surfaces, thus minimizing increased surface runoff. In addition, the Applicant intends to apply best management practices to minimize surface runoff pre- and postconstruction and therefore anticipates no detention ponds will be necessary. For a more comprehensive discussion of best management practices to be implemented to address water runoff, please see the answer to the previous question. Should unforeseen runoff issues arise despite the implementation of these practices, the Applicant will take necessary measures and/or work with the county to address them.

III. Section 8.04.03 Requirements and Information

This section addresses the requirements of Section 8.04.03 of the Boone County Zoning Ordinance.

1. The name(s) of project applicant.

Great Pathfinder Wind, LLC. See the application form and Section I.A of this application supplement for additional information regarding the Applicant.

See Appendix 8 for the list of Participating Landowners.

2. The name of the project owner.

Great Pathfinder Wind, LLC. See the application form and Section I.A of this application supplement for additional information.

3. The legal description and address of the project.

See Appendix 7 for legal descriptions, addresses (where available), and parcel identification numbers (PINs) for all property with aboveground facilities included in the Project.

4. A description of the project including: Number, type, name plate generating capacity, tower height, rotor diameter, and total height of all wind turbines and means of interconnecting with the electrical grid.

As noted in Section I.B of this application supplement, the Applicant is currently considering five turbine models for the Project. The table below provides the nameplate capacity, hub height, rotor diameter, tip height, and number of turbines for each of the turbine models currently being considered for the Project. As also noted in Section I.B., the Applicant currently anticipates using Vestas V150 4.2 MW turbines for the Project, therefore all the figures and appendices provided with this application are based on that turbine model. However, the site plan in Appendix 2 depicts enough proposed turbine locations to allow the Applicant to comply with all setback and other requirements in the ordinance regardless of which turbine model is ultimately selected for the Project. The Applicant plans to select the most appropriate technology for the Project based on availability, optimization of wind and land resources, and cost. Should the Applicant select a turbine other than the Vestas V150 4.2 MW turbine for the Project, the Applicant will comply with all ordinance requirements and provide an updated setback map and acoustical analysis for the selected model prior to construction.

Table 5 – Proposed Turbine Models

Proposed Turbine Models	Nameplate Capacity (MW)	Tower Height or Hub Height (Feet)	Rotor Diameter (Feet)	Total Tower Height or Tip Height (Feet)	Total Number of Installed Turbines in the Project	Total Number of Installed Turbines in Boone County	Final Wind Turbine Sites Will Meet Ordinance Requirements
Vestas V150	4.2	344.5	492.1	590.6	53	Up to 33	Yes
Vestas V150	5.6	344.5	492.1	590.6	40	Up to 33	Yes
Nordex N149	4.8	354.3	488.8	598.6	46	Up to 33	Yes
General Electric GE140	3.03	321.5	459.3	551.2	74	Up to 40	Yes
Siemens Gamesa SG145	5.0	336.3	475.7	574.1	45	Up to 33	Yes

The portion of the Project in Boone County will consist of up to 40 wind turbine generators, which will be connected to the Project substation via an underground collection system. The Project substation will be connected to the electrical grid at the ITC Doud Substation via an approximately 7.5-mile 161 kV overhead generation tie line to be located East of Boone in Jackson Township along 120th Street between R Avenue and S Avenue.

5. Site layout, including the location of property lines, wind turbines, electrical grid, and all related accessory structures. This site layout shall include distances and be drawn to scale.

See Appendix 2 for a site plan overview map and Appendix 3 for a setback map showing all property lines, the electrical grid, and all Project facilities for which a CUP is sought. Proposed turbine locations may shift within identified parcels during final micrositing. These shifts could be necessary for a variety of reasons, such as the results of geotechnical soil investigations, wetlands delineations, or architectural or cultural resource surveys. Adjustments to underground collection and access road locations may occur to accommodate landowner requests, shifts to turbine locations, or discovery of environmental or physical properties that can be avoided. If any changes to the locations of any Project facilities are made during final micrositing, the Applicant will provide an updated site plan showing the final location of all Project facilities.

6. Engineer's certification.

All wind turbines are built to conform to industry standards, including the American National Standards Institute ("ANSI"). Appendix 9 is a certification from the Project engineer for the Vestas V150 4.2 MW turbines the Applicant anticipates using for the Project. Should the Applicant select another turbine model for the Project, the Applicant will provide an updated certification before applying for the building permits necessary for the Project. In addition, the Applicant will include a certification from a qualified structural engineer in its building permit application stating that the foundation and tower designs for the Project are compatible with and within acceptable standards given local soil and climate conditions.

7. Documentation of land ownership or legal control of the property.

See Appendix 18 for copies of the recorded Memorandum of Easement Agreements signed by participating landowners granting the Applicant the right to construct Project facilities on their land. The Wind Easement Agreements presently cover over 8,800 acres in Boone County. In addition, the Applicant has an option to purchase approximately 7 acres within Boone County for location of the Project substation and the O&M facility as shown in Appendix 2.

8. The latitude and longitude of individual wind turbines.

See Appendix 7 for the approximate latitude and longitude of each proposed wind turbine location.

9. A USGS topographical map, or map with similar data, of the property and surrounding area, including any other Wind Energy Conversion System, within 10 rotor distances of the proposed Wind Energy Conversion System.

See Appendix 4 for the applicable map and data for property within 10 rotor distances of the Project boundary. There are no existing WECS within 10 rotor distances of the Project.

10. Location of wetlands, scenic, and natural areas (including bluffs) within 1,320 feet of the proposed Wind Energy Conversion System.

See Appendix 5 for the location of all wetlands, scenic, and natural areas (including bluffs) within 1,320 feet of proposed WECS.

11. An Acoustical Analysis.

See Appendix 10 for the acoustical analysis of the Project.

HDR Engineering, Inc. conducted an acoustical analysis to estimate sound levels for the proposed Project. The acoustical analysis was prepared based on the Applicant utilizing Vestas V150 4.2 MW turbines for the Project. Noise to be generated by the proposed facilities was modeled within the Openwind software using ISO 9613-2, an international standard. The model accounted for ground porosity, geometric spreading, and the atmosphere to determine the anticipated propagation of sound from the turbines. Using the atmospheric attenuation (absorption) coefficient ISO 9613-1, based on the site's temperature, air density, and relative humidity, an A-weighted sound pressure level was calculated on each structure throughout the proposed Project area. The analysis indicated that sound levels from the proposed turbines will not exceed the limits set forth in Section 8.04.08(11) of the Boone County Zoning Ordinance, as sound levels from the proposed turbines will be less than 50 dBA at the nearest structure or use.[3] If proposed turbine locations are modified or an alternate turbine model is utilized for the Project, the Applicant will provide an updated acoustical analysis demonstrating compliance with Section 8.04.08(11).

12. FAA Evaluation

Proposed turbine locations have been filed with the FAA and are under review; the results for the

[3] The acoustical analysis includes turbines that are no longer being proposed. Consequently, the analysis is conservative; we would expect the modeling for the current layout to result in the lower dBA level.

turbines proposed to be built in Boone County will be provided upon receipt from the FAA. See Appendix 11 for notification provided to the FAA regarding the proposed Project.

13. Location of all known Communication Towers within two miles of the proposed Wind Energy Conversion System.

In compliance with Section 8.04.03(13), Appendix 12 lists the locations of all known communication towers within two miles of the Project boundary and the associated report. In addition, Evans Engineering Solutions conducted a study of the effects upon FCC licensed radio frequency facilities from the proposed Project. The study found that there are no FCC licensed facilities that would be affected by the proposed Project.

Consistent with Section 8.04.08(12) of the Boone County Zoning Ordinance, the Applicant will notify all communication tower operators within five miles of the proposed Project boundary upon application to the city/county for necessary permits, including the operators of communication towers identified in the report.

14. Decommissioning Plan.

See Appendix 13 for a decommissioning plan that has been developed by Westwood Professional Services. The decommissioning plan identifies the processes and cost associated with the potential decommissioning of the proposed Project to ground level.

15. Description of potential impacts on nearby Wind Energy Conversion Systems and wind resources on adjacent properties.

There are no existing WECS near the proposed Project, as the closest existing WECS is more than 9.7 miles away in the non-dominant wind direction (SW). Accordingly, the proposed Project will have no impact on any existing WECS. See Appendix 4 for existing WECS locations.

IV. 8.04.05 Setback Requirements

In designing the layout for the Project, the Applicant worked with participating landowners to minimize impacts to farmland, residential properties, and any other site-specific concerns such as stream crossings. The Applicant has identified sufficient proposed wind turbine locations to allow final wind turbine locations to comply with all setback and other ordinance requirements regardless of which turbine model is ultimately selected for the Project. The proposed layout for the Project meets or exceeds the setbacks prescribed by the Boone County Zoning Ordinance, as shown in the table below, except to the extent waived by participating landowners pursuant to written waivers in accordance with Section 8.04.05.[4] Setback waivers are included in Appendix 17. For purpose of this analysis, the Applicant used the tallest turbine model in consideration, the Nordex N149, which has a tip height of 598.6 feet, to ensure that all setback requirements would be met for all turbine models under consideration.

Table 6 – Section 8.04.05 Requirements

Type of Setback	Setback Distance Required by Section 8.04.05	Does Project Meet Required Setback?
Property Lines	1.25 times the total height	Yes
Neighboring Dwelling Units	1,250 feet	Yes
Road Rights of Way (ROW)	One (1) times the total height	Yes
Other Rights of Way (ROW)	The greater of: The fall zone, as certified by a professional engineer + ten (10) feet or one times the total height	Yes. See Appendix 16 for Fall Zone Certification.
Public Conservation Lands	600 feet	Yes
Wetlands, USFW Types III, IV, and V	600 feet	Yes
Other Structures	The greater of: The fall zone, as certified by a professional engineer + ten (10) feet or one times the total height	Yes. All turbines will be set back a distance greater than 608.6 feet, which is the equal to the maximum fall zone distance of any proposed turbine model under consideration for the Project as certified by a professional engineer plus 10 additional feet. See Appendix 16 for Fall Zone Certification.
Other Existing WECS	To be considered based on: 1. Relative size of the existing and proposed WECS 2. Alignment of the WECS relative to the predominant winds	The Project is greater than 100 rotor diameters (>9.3 miles) from two neighboring wind farms. Conditions are not favorable for wake

[4] Turbines S3, S7, T1, T29, T31, T58, and T63 will require setback waivers for their proposed locations. Great Pathfinder is in negotiation with the neighboring landowners to obtain the setback waivers. These locations will only be used if the setback waivers are secured. Great Pathfinder will submit the setback waivers prior to construction. See setback maps in Appendix 3 for the proposed turbine locations.

	3. Topography 4. Extent of wake interference impacts on existing WECS 5. Property line setback of existing WECS 6. Other setbacks required	propagation. See Appendix 4 for existing WECS locations.
River Bluffs	1,320 feet	Yes

V. Section 8.04.08 Requirements

The Applicant will comply with the Special Safety and Design Standards set forth in Section 8.04.08 of the Boone County Zoning Ordinance, which are also outlined below.

Table 7 – Section 8.04.08 Requirements

Requirement	Great Pathfinder Addressed
1. Clearance of rotor blades or airfoils must maintain a minimum of twelve (12) feet of clearance between their lowest point and the ground.	All rotor blades or airfoils will maintain at least twelve (12) feet of clearance between their lowest point and the ground.
2. All Commercial/Utility WECS shall have a sign or signs posted on the tower, transformer and substation, warning of high voltage. Other signs shall be posted on the turbine with emergency contact information.	As described in Section II.9 of this application supplement, signs will be posted on the towers, transformer, and substation warning of high voltage and providing 24/7 emergency contact information. Additional signage will be posted at the entrance to each private access road throughout the Project that includes turbine information, a no-trespassing warning, and 911 information designated by the county.
3. All wind turbines, which are a part of a Commercial/Utility WECS, shall be installed with a tubular, monopole type tower.	All turbines will be installed with a tubular, monopole-type tower as shown in Figure 2.
4. Consideration shall be given to painted aviation warnings on all towers less than 200 feet.	No towers utilized for the Project will be lower than 200 feet.
5. Color and Finish: All wind turbines and towers that are part of a commercial/utility WECS shall be white, grey, or another non-obtrusive color. Blades may be black in order to facilitate deicing. Finishes shall be matte or non-reflective.	The tower and blades for each wind turbine will be painted a non-reflective, non-obtrusive color. No advertising or signage other than safety warnings or standard manufacturer markings and the signage described in this application supplement will be affixed to any of the turbines. As described in Sections II.5 and II.9 of this application supplement, the Project will comply with all applicable signage provisions of the Boone County Zoning Ordinance.
6. Lighting: Lighting, including lighting intensity and frequency of strobe, shall adhere to but not exceed requirements established by the Federal Aviation Administration (FAA) permits and regulations. Red strobe lights shall be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds. Red pulsating incandescent lights should be avoided.	As described in Sections II.9 and II.10 of this application supplement, red strobe lights will be used during nighttime illumination to reduce impacts on neighboring uses and migratory birds, and red pulsating incandescent lights will be avoided. In addition, all lighting, including intensity and frequency of strobe, will adhere to requirements established by the applicable FAA permits and regulations.
7. Other signage: All other signage shall comply with the sign regulations found in these regulations.	As described in Sections II.5 and II.9 of this application supplement, the Project facilities will comply with all applicable signage provisions of the Boone County Zoning Ordinance.
8. Feeder Lines: All communications and feeder lines, equal to or less than 34.5 KV in capacity, installed as part of a WECS shall be buried, where feasible. Feeder lines installed as part of a WECS shall not be considered an essential service.	All communication and feeder lines installed as part of the Project will buried.

9. Waste Disposal: Solid and Hazardous wastes, including but not limited to crates, packaging materials, damaged or worn parts, as well as used oils and lubricants, shall be removed from the site promptly and disposed of in accordance with all applicable local, state and federal regulations.	As described in Section II.13 of this application supplement, all solid and hazardous wastes generated during the construction, operation, or maintenance of the Project will be removed from the Project area promptly and disposed of in accordance with all federal, state, and local laws and regulations regarding waste disposal in accordance with Section 8.04.08(9) of the Ordinance. It is not anticipated that the construction, operation, or maintenance of the Project will result in the generation of any hazardous wastes.
10. Discontinuation and Decommissioning: A WECS shall be considered a discontinued use after one (1) year without energy production, unless a plan is developed and submitted to the Zoning Administrator outlining the steps and schedule for returning the WECS to service. All WECS and accessory facilities shall be removed to ground level within ninety (90) days of the discontinuation of use. Each Commercial/Utility WECS shall have a Decommissioning Plan outlining the anticipated means and cost of removing WECS at the end of their serviceable life or upon being discontinued use. The cost estimates shall be made by a competent party; such as a Professional Engineer, a contractor capable of decommissioning or a person with suitable expertise or experience with decommissioning. The plan shall also identify the financial resources that will be available to pay for decommissioning and removal of the WECS and accessory facilities.	A decommissioning plan developed by a qualified third-party professional meeting all requirements stated in Section 8.04.08(10) of the Boone County Zoning Ordinance is provided in Appendix 13.
11. Noise: No Commercial/Utility WECS shall exceed 50 dBA at the nearest structure or use.	As described in Sections II.7, II.14, and III.11 of this application supplement, the noise level generated by the Project facilities will not exceed 50 dBA at the nearest structure or use consistent with Section 8.04.08(11) of the Boone County Zoning Ordinance. An acoustical analysis prepared by a qualified third-party professional is provided as Appendix 10.
12. Interference: The applicant shall minimize or mitigate interference with electromagnetic communications, such as radio, telephone, microwaves, or television signals caused by any WECS. The applicant shall notify all communication tower operators within five miles of the proposed WECS location upon application to the city/county for permits.	It is not anticipated that the proposed Project will cause interference with electromagnetic communications. Should such interference with electromagnetic communications occur, however, the Applicant will identify and take appropriate steps to minimize it. A qualified third party studied the anticipated effects on FCC-licensed radio frequency facilities from the proposed Project and concluded that no such facilities would be affected thereby. The Applicant will notify all communication tower operators within five miles of any final turbine location upon application to the city/county for necessary permits, including the operators of communication towers within two miles of the Project boundary identified in Appendix 12.

13. Roads: Applicants shall: (a) Identify all county, municipal or township roads to be used for the purpose of transporting WECS, substation parts, cement, and/or equipment for construction, operation or maintenance of the WECS and obtain applicable weight and size permits from the impacted jurisdictions prior to construction; (b) Conduct a pre-construction survey, in coordination with the appropriate jurisdictions to determine existing road conditions. The survey shall include photographs and a written agreement to document the condition of the public facility; AND (c) Be responsible for restoring or paying damages as agreed to by the applicable jurisdiction sufficient to restore the road(s) and bridges to preconstruction conditions.	As described in Sections II.3, II.4, and II.11 of this application supplement, the Applicant will take all actions required by Section 8.04.08(13) of the Boone County Ordinance and will work with the Boone County engineer to enter into an agreement with the county prior to construction.
14. Drainage System: The applicant shall be responsible for immediate repair of damage to public drainage systems stemming from construction, operation or maintenance of the WECS.	As described in Section II.8 of this application supplement, as required by Section 8.04.08(14) of the Boone County Zoning Ordinance, the Applicant will be responsible for immediate repair of damage to public drainage systems stemming from construction, operation, or maintenance of the Project facilities. The Applicant will work with the Boone County Engineer to prepare a Public Drainage System Repair Agreement and enter into an agreement for the Project prior to construction.

VI. Section 5.06.02

As detailed in this Application, the Project meets all the development criteria required for a conditional use project. In addition, consistent with Section 5.06.02 of the Boone County Zoning Ordinance, the Applicant will ensure that the Project will not have detrimental impacts on Boone County with respect to health and safety, light and air, road congestion or hazards, property values, or county planning and development, as discussed below.

1. The Project will adequately safeguard the health, safety and general welfare of persons residing or working in adjoining or surrounding property.

To ensure the Project will adequately safeguard the health, safety, and general welfare of persons residing or working in adjoining or surrounding property, the Applicant will prepare emergency plans to protect the public health, safety, and environment on and off the Project site in the case of a natural disaster or industrial accident relating to or affecting the Project. Prior to construction, the Applicant will update the plans to incorporate manufacturer and vendor safety information for the specific equipment to be installed at the Project site. During construction and operation, the Applicant will implement the plans with its construction and operations teams in coordination with the local emergency response agencies. The plans will detail emergency response procedures to be implemented during various emergency situations that may affect the Project or the surrounding community or environment.

Based on the Applicant's experience in operating other similar wind projects, a key element of an effective emergency and safety plan is the ability to communicate. Therefore, during both construction and operation of the Project, all operations and construction team leaders will be equipped with two-way short-band radios and cellular phones to provide consistent, prompt, and effective communication regarding conditions on the Project site.

The emergency plans prepared by the Applicant will address unplanned events that could conceivably occur at or near the Project site due to natural causes, equipment failure, or human error. Potential events that will be covered by the emergency plans include the following:

- Personnel injuries;
- Construction accidents;
- Project evacuation;
- Fire or explosion;
- Floods;
- Extreme weather events.

In addition, the Project O&M personnel and third-party contractors will receive regular emergency response and safety training to ensure that effective and safe action will be taken to reduce and limit the impact of an emergency at the Project site.

2. The Project will not impair an adequate supply (including quality) of light and air to surrounding property.

The Project will not impair the supply or quality of light and air to surrounding property. The Project is designed to prevent shadow flicker from exceeding 40 hours per year on non-participating occupied structures within the Project area. No wind turbines will be placed within 1,250 feet of

any residential building or business as measured from the outside wall. During operation, the Project will produce no emissions and will displace the very small increase in emissions during construction of the Project by several orders of magnitude. The Project will thus have no detrimental impact on the supply or quality of air to surrounding properties.

3. The Project will not unduly increase congestion in the roads, or the hazard from fire, flood or similar dangers.

The Project will not unduly increase congestion in the roads. During construction, a temporary increase in traffic within the Project area and its neighboring public roads is anticipated, as described in section II.3 of this application supplement. This temporary increased traffic volume is not anticipated to last longer than 12 months. The postconstruction phase of project development is not anticipated to generate significant ongoing automotive or pedestrian traffic.

The Project poses minimal explosion or fire potential, as there is no need to combust fuel to generate power, as would be the case with a thermal power plant. However, as with any major construction undertaking, construction of the Project does present some minimal fire risks. The Applicant will mitigate fire risk associated with the Project through its emergency plan, training, and project design. Electrical designs for the Project will comply with codes and standards, including the National Electric Code (NEC), the National Electric Safety Code (NESC) and the National Fire Protection Agency (NFPA).

Lightning-induced fires are rare in the Project area, and the wind turbine generators as well as the substation are equipped with specially engineered lightning protection systems. With the types of modern wind turbines proposed for the Project, turbine malfunctions leading to fires in the nacelle are extremely rare. The turbine-control system will detect overheating in turbine machinery, causing the machine to shut down immediately and send an alarm signal to the central SCADA system, which would in turn notify operators of the problem by cell phone or pager. In addition, the Applicant will coordinate preconstruction coordination meetings with the Boone County Fire Marshal, local fire officials, and Project contractors to discuss preventive measures and emergency protocols to be followed during construction and operation of the Project.

The Project will not unduly increase the risk of hazards from floods or similar dangers. As described in Section II.12 of this application supplement, the Applicant only anticipates citing underground facilities within the portion of the Project area that is within the 100-year floodplain. In addition, as described in Sections II.11 and II.15, the Applicant will employ appropriate best management practices during and after construction to preserve and protect the natural integrity of water flows in and around the Project area and minimize the risk of erosion or downstream sedimentation in accordance with the SWPPP. These steps will ensure that the Project does not unduly increase the risk of floods in and around the Project area.

4. The Project will not diminish or impair established property values on adjoining or surrounding property.

The Project is not anticipated to diminish or impair established property values of adjoining or surrounding properties. The Applicant hired MaRous & Company, a real estate consulting firm with extensive experience conducting market analyses of a variety of energy projects in the Midwest, as well as residential, commercial, and industrial developments and recreational use sites, to prepare a property value impact report for the Project. The purpose of the report was to analyze the anticipated impact, if any, on the value of the surrounding properties resulting from

the proposed wind farm. MaRous & Company determined that the Project would not have a negative impact on the value of the surrounding rural residential or agricultural property. The report reflecting that analysis is provided in Appendix 14.

5. The Project is in accord with the intent, purpose and spirit of the Zoning Ordinance or Comprehensive Development Plan.

As expressed in Section 1.03, the purpose of the Boone County Zoning Ordinance is "to promote, in accordance with present and future needs, the health, safety, morals, convenience, order, prosperity and general welfare of the present and future inhabitants of Boone County." The Project is consistent with the intent and purpose of the Boone County Zoning Ordinance because it addresses both the present and future needs of Boone County residents. Moreover, as further expressed in Section 1.03, the ordinance reflects consideration given to "existing use and character of property, to the character of the particular district involved, and its peculiar suitability for particular uses, to trends of growth or change, and with a view to conserving natural resources and the value of land and buildings and encouraging the most appropriate use of land." Because the Applicant has designed the Project to meet every requirement and development criteria provided for in the ordinance, it too reflects the consideration Boone County has given to appropriately planned land use in the County.

In addition, as discussed further in Section II.11 of this application supplement, the proposed Project is consistent with goals and policies expressed in the Boone County Comprehensive Plan (Plan). First, the proposed Project is consistent with the expressed purpose of the Plan "to promote orderly growth and development for the county and its communities for the next twenty years." Second, power generated by the proposed Project will be delivered into the Iowa electrical grid, reducing the need to import electricity from outside markets while supporting sustained agricultural production throughout Boone County. Third, the proposed Project is likewise consistent with stated policy expressed in Section 5.7 of the Plan to "encourage economic development projects which do not conflict with the agricultural character of the county." Fourth, the proposed Project supports the water resource policy expressed in Section 4.7 of the Plan, which prefers "land use management practices and nonstructural solutions to problems of erosion and flooding" over structural solutions.