

4906-17-05 Technical Data

(A) PROJECT AREA SITE

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(1) Geography and Topography

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(2) Aerial Photography

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(3) Site Mapping

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(4) Geology and Seismology

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(a) Site Geology

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) Geologic Hazards

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the revision of Table 5-2: [Application, 5-5 to 5-6]

TABLE 5-2
Geologic and Geotechnical Hazards Summary

Hazard	Present at Site?	Comment
Flooding/High groundwater	Yes	The site is relatively flat and poorly drained soils exist throughout much of the site and could be prone to localized flooding. No turbines are located in a FEMA flood zone.
Slope failure	No	The site is relatively flat.
Subsidence – Pumping	Unlikely	Project area is underlain by bedrock with a framework capable of resisting subsidence due to production of oil, gas, or water.
Subsidence – Mining	No	Mining activity is limited to limestone quarry operation and no coal mining
Subsidence – Caves/Karst	Possibly	<i>Bedrock is susceptible to dissolution, but no current karst hazards areas are presently known in the Project area.</i>
Earthquake/Seismicity	Unlikely	The site is in a moderately low seismic area.
Swelling/shrinking soil	Yes	Lake origin (fat) clay soil is present throughout the site.
Corrosive soil	Possibly	Clay soils exist throughout the Project area, which are potentially corrosive to steel.
Made ground	Unlikely	<i>No coal mining exists in the region and there does not appear to be any significant relief associated with raised grades. There is a small potential for filled areas associated with the low-lying swamp areas.</i>
Collapsible soil	No	Collapsible soils are not known or likely to be present.
Volcanic activity	No	No current volcanic activity exists in the region.
Quick clay	No	Quick clay conditions are not known or likely to be present.

Source: Barr, 2009.

(c) Soil Suitability

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(5) **Hydrology and Wind**

(a) **Water Budgets**

(i) **Surface Water Resources**

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(ii) **Groundwater Resources**

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following:
[Application 5-14]

- The Applicant would like to clarify that no sole source aquifers are located near the Project area. The closest designated sole source aquifer is approximately 8 miles to the southeast of the Facility.

(iii) **Construction Water Usage**

Water use during construction of the Facility will entail such operations as temporary concrete batch plant operations, dust suppression *and road watering. Construction water demands for the site will be temporary. Portable restroom facilities will be used for construction workers; therefore, they will not require water.*

The Applicant is evaluating the possibility of creating a temporary concrete batch plant for producing the concrete necessary during Facility construction. This plant will be located *either* on a 20-acre property located in the southeastern portion of the Project area (*that* will be the location of the future O&M building) *or at the existing Stoneco quarry property near Scott.*

It is estimated that the plant will operate *12 hours a day*, 6 days a week and produce up to 1,500 cubic yards of concrete per day. Based on this production rate, the estimated water demand will be approximately 55,000 gallons per day (gpd) (about 115 gpm).

For the 20-acre property, water will be supplied via one of three or a combination of the following options:

- Onsite bedrock wells*
- Trucking in water from the Stoneco quarry near Scott, Ohio*
- Trucking in water from another source*

Onsite bedrock wells would be drilled and completed at a depth of several hundred feet. Available water well logs near this site indicate that the deepest local domestic well was 63 feet in depth and is completed in bedrock. If a batch plant is *planned for the O&M Building/Substation site*, a production test well and associated observation wells will be installed *prior to mobilization of the batch plant* and tested to determine the specific yield for the well. Depending on the production test well results, a water storage tank may be considered to reduce peak demand on the water supply wells.

If a batch plant is planned for the Stoneco Quarry property, water will be provided by an existing onsite well with a pump rate of 100 gpm. Additional water requirements would be provided by trucking in water from another source.

(iv) Operation Water Usage

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) Floods and High Winds

(i) Floods

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following: [Application, 5-15 to 5-16]

- Turbines 69 and 146 have shifted from the revised layout. All unrevised and revised turbine locations were confirmed to be outside of the 100-year floodplain limits.
- Turbine BC-I 20 is within approximately 10 feet of a floodplain.
- The following statement will be added to the Civil Engineering drawings for any turbine located within 50 feet of the 100-year floodplain: “No permanent fill material will be placed within the limits of the 100-Year Floodplain”.
- Portions of access roads and overhead transmission lines are located within the 100-year floodplain. The floodplains within the Project area boundary are classified as FEMA Zone A. This means the boundaries defined are approximate because no detailed study has been completed. Construction within these areas is generally allowed provided the original contours are not significantly modified due to construction activities. This has been confirmed with Tony Windsor and Nancy Blanke, the FEMA floodplain administrators at Paulding County and Van Wert County, respectively. The construction activities for this Facility will not change the contours within the floodplain. As currently proposed, underground collector lines will cross the 100-year floodplain associated with Blue Creek, Hoaglin Creek, Maddox Creek, Town Creek and Prairie Creek, and an

overhead collector line will cross the 100-year floodplain of Hoaglin Creek

(ii) Winds

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(c) Maps

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(B) LAYOUT AND CONSTRUCTION

This section describes the layout and construction of the Facility.

(1) Project Area Site Activities

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following:

- There are no longer Phase I and Phase II construction dates because the Project is being considered as one development. [Application, 5-18]
- Approximately 60 large truck trips per day (delivering wind turbines and associated equipment) are anticipated during construction of the Project. The December 21, 2009 text identified 20 large truck trips. [Application, 5-19]
- Up to 200 small vehicle (pickups and automobiles) trips per day within the Project area are anticipated during construction. The December 21, 2009 text identified 100 small vehicle trips. [Application, 5-19]

(a) Wind Turbine Foundation

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following:

- Figure 5-10 has been updated to show the potential locations of the concrete batch plant.
- The crane pad includes an area of 100 feet by 75 feet. The December 21, 2009 filing identified an area of 40 feet by 60 feet. [Application, 5-21]

(b) Underground Electric Collection System

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section except for the following: [Application, 5-22]

- The underground collection system will require varying widths of temporary ROW depending upon the number of collection lines in the trench:
 - 1 Collector = 24 feet
 - 2 Collectors = 32 feet
 - 3 Collectors = 40 feet
 - 4 Collectors = 48 feet
 - 5 Collectors = 56 feetThe December 21, 2009 filing identified a 20-foot ROW.

(c) Aboveground Collection Lines

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following: [Application, 5-23]

- There will be approximately 7.0 miles of 115kV aboveground collection lines. The December 21, 2009 filing identified 6.0 miles.

(d) Substations

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(e) O&M Building

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(f) Test Borings and Cone Penetrating Test

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(g) Removal of Vegetation [Application, 5-25-5 to 26]

Construction of the Facility will require removal of vegetation at all turbine sites, access roads, collection system line routes, substations, temporary staging and construction laydown area, met tower(s) and SODAR facility, and O&M building locations. It is assumed that a 150-foot radius will be cleared for each turbine footprint, a 40-foot wide corridor for access roads, and 100-foot wide corridor for the aboveground 34.5 kV and 115 kV collection lines. *The underground collection system will require varying widths of temporary ROW depending upon the number of collection lines in the trench:*

- *1 Collector = 24 feet*
- *2 Collectors = 32 feet*
- *3 Collectors = 40 feet*
- *4 Collectors = 48 feet*
- *5 Collectors = 56 feet*

Two of the substations will require 5 acres each for construction. Two substations will be constructed within a 20-acre area that will include the temporary staging construction laydown area, O&M building, and temporary concrete batch plant.

It is anticipated that **1,264.4 acres** of vegetation (1237.3 *acres* of cultivated crops and **19.6 acres** of deciduous forest) will be temporarily removed during construction of the Facility; and of that, **223.0 acres** (**213.2 acres** of cultivated crops and **8.6 acres** of deciduous forest) will be removed permanently. Temporarily disturbed areas will be re-seeded to blend in with existing vegetation as needed. To the extent practicable, disturbance of wetlands during construction and operation of the Facility will be avoided. Applicable permit approvals will be obtained for any impacts to jurisdictional wetlands.

The majority of the Project area is agricultural land. The Facility has been designed to avoid forested areas; therefore, limited tree clearing is expected. The Applicant will use BMPs during construction and operation of the Facility to protect topsoil and adjacent resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil and stabilizing restored material, and revegetating areas.

The Applicant will dispose of all vegetation that has to be removed. The topsoil will be stripped and stockpiled within the construction area for later use during restoration activities. Trees cleared from the Project area will be cut into logs and either left for the landowner or removed. Limbs and brush will be buried, chipped, or otherwise disposed of as directed by the landowner and as required under federal, state, and local regulations.

(h) Grading and Drainage

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(i) Access Roads [Application, 5-27 to 5-28]

Wherever possible, existing roads will be upgraded for use as an access road during construction and maintenance activities. Where an existing road is not available, new temporary and permanent access roads will be constructed.

The roads have been sited in consultation with local landowners. The roads will facilitate both construction and ongoing operation and maintenance. Siting roads in areas with unstable soil will be avoided. All roads will include appropriate drainage and culverts while still allowing for the crossing of farm equipment. The applicant will select the location of these temporary and permanent access roads to minimize or avoid sensitive resources.

Private access roads will be built adjacent to the towers, allowing access to the turbine strings both during and after construction. During construction, the roads will be approximately 40 feet wide to accommodate safe crane movement, equipment delivery, and other construction vehicles. *Road building will include about 54.7 miles of one-time pass temporary crane paths with only minor grading to maintain the necessary slope for safe transportation. Only limited post-construction restoration would be required.* After construction is complete, permanent access roads will be utilized for maintenance activities. The **41.5** miles of access roads will be up to 20 feet wide (including the access road and drainage channels).

These roads will consist of graded dirt overlaid with geotechnical fabric (if needed) and covered with gravel. The roads will be prepared to support the size and weight of maintenance vehicles.

Roadway improvements will also be required primarily at intersections to widen the roads to accommodate turbine delivery. Additional roadway improvements may be necessary, based on the results of a pre-delivery review conducted by Gamesa's selected trucking company. This pre-delivery review is typically scheduled prior to component delivery in the spring prior to erection, and is currently anticipated to occur in spring 2011.

(j) Removal and Disposal of Debris

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(k) Post-Construction Reclamation

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(2) Layout

Figure 5-10 provides a map that shows the various elements of the Facility.

(a) Wind-Powered Electric Generation Turbines [Application, 5-29]

Figure 5-10 provides the location of the proposed *159* G-90 wind-powered electric generating turbines at the scale of 1:12,000.

(b) Transformers and Collection Lines [Application, 5-29]

The proposed Facility will require approximately *103.2* miles of underground and *5.4* miles of aboveground 34.5 kV collection system and approximately *7.0* miles of aboveground 115 kV collection line. Figure 5-10 provides the location of the collection lines. In the event the GE turbine model is used, a pad-mounted transformer will be located near the base of the turbine. For all other proposed turbine models, the transformer will be located in the nacelle.

(c) Construction Laydown Areas

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(d) Transmission Lines

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(e) Substations

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(f) Transportation Facilities and Access Roads [Application, 5-30]

A total of **41.5** miles of access roads will be required for the Facility. Figure 5-10 provides the location of the access roads used during construction and maintenance activities.

(g) Security Facilities

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(h) Grade Elevations

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(i) Other Pertinent Installations

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(3) Structures

This section describes the major proposed structures of the Facility.

(a) Estimated Overall Dimensions

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) Construction Materials

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(c) Color and Texture of Facing Surfaces

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(d) Photographic Interpretation or Artist's Pictorial Sketches

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(e) Unusual Features

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(4) Plans for Construction

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(5) Future Plans

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following:

- The project will no longer be built in phases and will be considered as one development, with an operation start date of December 2011 and commissioning completed in March 2012. [Application, 5-34]

(C) EQUIPMENT [APPLICATION, 5-35]

As previously discussed, the equipment to be used for the Project area will include the following.

- **159** wind turbine generators¹;
- An electrical collection system using 34.5 kV underground and aboveground collection lines;
- Some 115 kV aboveground collection lines;
- Three intra-project collection substations;
- An interconnection substation;
- Up to two permanent met towers and a SODAR facility;
- A temporary concrete batch plant; and
- An O&M building.

The following sections provide a description for each Facility component.

(1) Wind Powered Generation Equipment**(a) Wind Energy Turbines**

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(i) Nacelle

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(ii) Rotors

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

¹ *Within this Application, specific locations for 159 turbines and other related Facility components are identified. The queue position for the proposed development has a maximum potential output of 350 MW or 175 two MW turbines.*

(iii) Tower

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(iv) Foundation

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) Electrical Components

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(i) 34.5 kV Electric Collection System

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following:
[Application, 5-38]

- Approximately 103.2 miles of underground collector lines and approximately 5.4 miles of aboveground 34.5 kV collector lines will be required for the Facility. The December 21, 2009 filing identified 78.6 and 3.7 miles respectively.

(ii) 115 kV Electric Line [Application, 5-38]

In locations where more than one set of aboveground 34.5 kV lines are needed, a small substation will be constructed to transform the electricity to 115 kV. By doing so, this will allow the use of only one set of poles. Approximately **7.0** miles of aboveground collection lines at 115 kV will be required. Appendix D provides typical drawings showing support structures for these aboveground lines.

(iii) Substations [Application, 5-39]

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following:

- The Applicant would like to clarify that the proposed voltage transformation process requires two collector subs that connect to the Project collection sub, which in turn connects to the interconnection sub.
- There are no longer Phase I and Phase II construction dates because the Project is being considered as one development.

(2) Safety Equipment

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(a) Proposed Major Public Safety Equipment

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(i) Construction

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

a) Fencing

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

b) Signage

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(ii) Operation

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

a) Gamesa Monitoring System

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

b) Braking System [Application, 5-43]

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section, except for the following:

- The Applicant would like to clarify that the RPM range for the G90 is 9 to 19 RPM, varying non-linearly with wind speed. This corresponds to a blade pass frequency of 0.45 to 0.95 Hz.

c) Lightning Protection

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

d) Fire Prevention

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

e) Aeronautical

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

f) Fencing and Access Control

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

g) Signage

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) Reliability of Equipment

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(c) Turbine Manufacturer's Safety Standards

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(3) Any Other Major Equipment

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(a) O&M Building

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) Met Tower(s)

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(c) SODAR Unit

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(d) Temporary Concrete Batch Plant [Application, 5-47]

The Applicant is evaluating the option of constructing a temporary concrete batch plant for producing concrete required during construction. *This plant will be located either on a 20-acre property in the southeastern portion of the Project area (that will be the site of the future O&M building) or at the existing Stoneco aggregate quarry property (Scott Quarry) near Scott.*

An aboveground storage tank may also be constructed at this location to provide for storage of water that will be required for batch plant operations during construction of the Facility. After construction is complete, the temporary concrete batch plant and associated water storage tank will be disassembled and removed.

(D) REGIONAL ELECTRIC POWER SYSTEMS

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(1) Interconnection Queue

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(a) Name of the Queue

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) Web Link of the Queue

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(c) Queue Number

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(d) Queue Date

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(2) System Studies

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(a) Feasibility Study

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(b) System Impact Study

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.

(c) Facilities Study

No text changes from the December 21, 2009 Blue Creek OPSB Application text have occurred in this section.