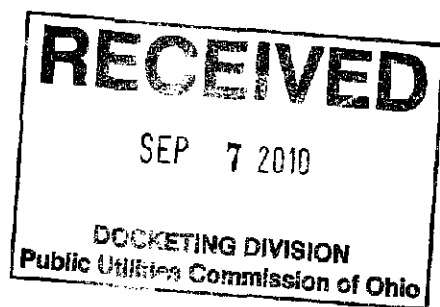


Staff Report of Investigation

Timber Road II Wind Farm
Case Number 10-0369-EL-BGN

September 7, 2010



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Ted Strickland, Governor Alan R. Schriber, Chairman

Ohio

**Power Siting
Board**

In the Matter of an Application by Paulding Wind Farm)
II LLC for a Certificate of Environmental Compatibility) **Case No. 10-0369-EL-BGN**
and Public Need for the Timber Road II Wind Farm)

Staff Report of Investigation

Submitted to the
OHIO POWER SITING BOARD

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BEFORE THE POWER SITING BOARD OF THE STATE OF OHIO

**In the Matter of an Application by Paulding Wind Farm)
II LLC for a Certificate of Environmental Compatibility) Case No. 10-0369-EL-BGN
and Public Need for the Timber Road II Wind Farm)**

Members of the Board:

Alan R. Schriber, Chairman, PUCO	Louis W. Blessing, Jr., State Representative
Lisa Patt-McDaniel, Director, ODD	Timothy J. DeGeeter, State Representative
Alvin Jackson, M.D., Director, ODH	Tom Sawyer, State Senator
Robert Boggs, Director, ODA	VACANT, State Senator
Christopher Korleski, Director, Ohio EPA	
Sean Logan, Director, ODNR	
Dr. Ali Keyhani, Public Member	

To the Honorable Power Siting Board:

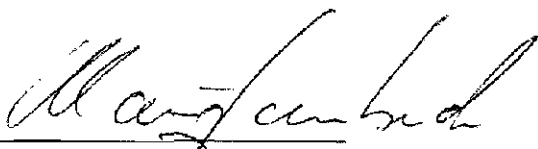
In accordance with provisions of the Ohio Revised Code (ORC) Section 4906.07(C), and the Commission's rules, the Staff has completed its investigation in the above matter and submits its findings and recommendations in this staff report for consideration by the Ohio Power Siting Board (Board).

The Staff Report of Investigation has been prepared by the Staff of the Public Utilities Commission of Ohio. The findings and recommendations contained in this report are the result of Staff coordination with the Ohio Environmental Protection Agency, the Ohio Department of Health, the Ohio Department of Development, the Ohio Department of Natural Resources, and the Ohio Department of Agriculture. In addition, the Staff coordinated with the Ohio Department of Transportation, the Ohio Historical Society, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the Federal Aviation Administration.

In accordance with ORC Sections 4906.07 and 4906.12, copies of this staff report have been filed with the Docketing Division of the Public Utilities Commission of Ohio on behalf of the Ohio Power Siting Board and served upon the Applicant or its authorized representative, the parties of record, and the main public libraries of the political subdivisions in the project area.

The staff report presents the results of the Staff's investigation conducted in accordance with ORC Chapter 4906 and the Rules of the Board, and does not purport to reflect the views of the Board nor should any party to the instant proceeding consider the Board in any manner constrained by the findings and recommendations set forth herein.

Respectfully submitted,


Klaus Lambeck, Chief
Facilities, Siting, & Environmental Analysis Division

ACRONYMS

AEP	American Electric Power
BMP	best management practices
dBA	decibels (A-weighted)
DOW	Division of Wildlife
FAA	Federal Aviation Administration
HDD	horizontal directional drill(ing)
Hz	hertz
kV	kilovolts
MW	megawatts
NERC	North American Electric Reliability Corporation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O&M	operations and maintenance
OAC	Ohio Administrative Code
ODA	Ohio Department of Agriculture
ODD	Ohio Department of Development
ODH	Ohio Department of Health
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
Ohio EPA	Ohio Environmental Protection Agency
OHPO	Ohio Historic Preservation Office
OPSB	Ohio Power Siting Board
ORC	Ohio Revised Code
PUCO	Public Utilities Commission of Ohio
SWPPP	Storm Water Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

I. POWERS AND DUTIES

OHIO POWER SITING BOARD

The Ohio Power Siting Board (Board or OPSB) was created on November 15, 1981, by amended Substitute House Bill 694 as a separate entity within the Public Utilities Commission of Ohio (PUCO). The authority of the Board is outlined in Ohio Revised Code (ORC) Chapter 4906.

The Board is authorized to issue certificates of environmental compatibility and public need for the construction, operation, and maintenance of major utility facilities as defined in ORC Section 4906.01. Included within this definition are: electric generating plants and associated facilities designed for, or capable of, operation at 50 megawatts (MW) or more; electric transmission lines and associated facilities of a design capacity greater than or equal to 125 kilovolts (kV); and gas and natural gas transmission lines and associated facilities designed for, or capable of, transporting gas or natural gas at pressures in excess of 125 pounds per square inch. In addition, per ORC Section 4906.20, the Board authority applies to economically significant wind farms, defined in ORC 4906.13(A) as wind turbines and associated facilities with a single interconnection to the electrical grid and designed for, or capable of, operation at an aggregate capacity of five MW or greater but less than 50 MW.

Membership of the Board is specified in ORC Section 4906.02(A). The voting members include: the Chairman of the PUCO who serves as Chairman of the Board; the directors of the Ohio Environmental Protection Agency, the Ohio Department of Health, the Ohio Department of Development, the Ohio Department of Agriculture, and the Ohio Department of Natural Resources; and a member of the public, specified as an engineer, appointed by the Governor from a list of three nominees provided by the Ohio Consumers' Counsel. Ex-officio Board members include two members (with alternates) from each house of the Ohio General Assembly.

NATURE OF INVESTIGATION

The OPSB has promulgated rules and regulations, found in Chapter 4906 of the Ohio Administrative Code (OAC), which establish application procedures for major utility facilities and wind farms.

Application Procedures

Any person that wishes to construct a major utility facility or economically significant wind farm in this state must first submit to the OPSB an application for a certificate of environmental compatibility and public need.¹ The application must include a description of the facility and its location, summary of environmental studies, a statement explaining the need for the facility and how it fits into the applicant's energy forecasts (for transmission projects), and any other information the OPSB may consider relevant.²

Within 60 days of receiving an application, the OPSB must determine whether it is sufficiently complete to begin an investigation.³ If an application is considered complete, the Chairman of the OPSB will cause a public hearing to be held 60 to 90 days after the official filing date of the

¹ ORC 4906.04 and 4906.20

² ORC 4906.10(A)(1) and 4906.20(B)(1)

³ OAC 4906-5-05(A)

completed application. At the public hearing, any person may provide written or oral testimony and may be examined by the parties.⁴ Parties include the Applicant, public officials, and any person who has been granted a motion of leave for intervention.⁵

Staff Investigation and Report

The Chairman will also cause each application to be investigated and a report published not less than 15 days prior to the public hearing. The report sets forth the nature of the investigation and contains the findings and conditions recommended by Staff. The Board's Staff, which consists of career professionals drawn from the Staff of the PUCO and other member agencies of the OPSB, coordinates its investigation among the agencies represented on the Board and with other interested agencies such as the Ohio Department of Transportation (ODOT), the Ohio Historical Society, and the U.S. Fish and Wildlife Service (USFWS).

The technical investigations and evaluations are conducted under guidance of the OPSB rules and regulations in OAC Chapter 4906. The recommended findings resulting from the Staff's investigation are described in the staff report pursuant to ORC Section 4906.07(C). The report does not represent the views or opinions of the OPSB and is only one piece of evidence that the Board may consider when making its decision. Once published, the report becomes a part of the record and is served upon all parties to the proceeding and is made available to any person upon request.⁶ A record of the public hearings and all evidence, including the staff report, may be examined by the public at anytime.⁷

Board Decision

The OPSB may approve, modify and approve, or deny an application for a certificate of environmental compatibility and public need. If the OPSB approves, or modifies and approves an application, it will issue a certificate subject to conditions. The certificate is also conditioned upon the facility being in compliance with standards and rules adopted under the ORC.⁸

Upon rendering its decision, the OPSB must issue an opinion stating its reasons for approving, modifying and approving, or denying an application for a certificate of environmental compatibility and public need.⁹ A copy of the OPSB's decision and its opinion is memorialized upon the record and must be served upon all parties to the proceeding.¹⁰ Any party to the proceeding that believes its issues were not adequately addressed by the OPSB may submit within 30 days an application for rehearing.¹¹ An entry on rehearing will be issued by the OPSB within 30 days and may be appealed within 60 days to the Supreme Court of Ohio.¹²

⁴ ORC 4906.07

⁵ ORC 4906.08(A)

⁶ ORC 4906.07(C) and 4906.10

⁷ ORC 4906.09 and 4906.12

⁸ ORC 4906.10(A) and (B)

⁹ ORC 4906.11

¹⁰ ORC 4906.10(C)

¹¹ ORC 4903.10 and 4906.12

¹² ORC 4903.11, 4903.12, and 4906.12

CRITERIA

The recommendations and conditions in this Staff Report of Investigation were developed pursuant to the criteria set forth in ORC Section 4906.07(C), which requires, in part, that the staff report shall contain recommended findings with regard to ORC Section 4906.10(A).

Section 4906.10(A) of the ORC reads in part:

The Board shall not grant a certificate for the construction, operation, and maintenance of a major utility facility, either as proposed or as modified by the Board, unless it finds and determines all of the following:

- (1) The basis of the need for the facility if the facility is an electric transmission line or gas or natural gas transmission line;
- (2) The nature of the probable environmental impact;
- (3) That the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, and other pertinent considerations;
- (4) In the case of an electric transmission line or generation facility, that the facility is consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems and that the facility will serve the interests of electric system economy and reliability;
- (5) That the facility will comply with Chapters 3704., 3734., and 6111. of the Revised Code and all rules and standards adopted under those chapters and under Sections 1501.33, 1501.34, and 4561.32 of the Revised Code. In determining whether the facility will comply with all rules and standards adopted under Section 4561.32 of the Revised Code, the Board shall consult with the ODOT Office of Aviation of the Division of Multi-Modal Planning and Programs of the Department of Transportation under Section 4561.341 of the Revised Code.
- (6) That the facility will serve the public interest, convenience, and necessity;
- (7) In addition to the provisions contained in divisions (A)(1) through (A)(6) of this section and rules adopted under those divisions, what its impact will be on the viability as agricultural land of any land in an existing agricultural district established under Chapter 929. of the Revised Code that is located within the site and alternative site of the proposed major utility facility. Rules adopted to evaluate impact under division (A)(7) of this section shall not require the compilation, creation, submission, or production of any information, document, or other data pertaining to land not located within the site and alternate site.
- (8) That the facility incorporates maximum feasible water conservation practices as determined by the Board, considering available technology and the nature and economics of the various alternatives.

II. APPLICATION

APPLICANT

In this proceeding, Paulding Wind Farm II LLC (Applicant) is seeking authority to construct a wind-powered electric generating facility, or wind farm, in Paulding County, Ohio. The wind farm, including all leases and facility assets, would be owned and operated by the Applicant. The interconnect switching station would be transferred to American Electric Power (AEP). AEP will retain ownership of the existing Haviland-Milan 138 kV circuit.

Paulding Wind Farm II LLC is a wholly-owned subsidiary of Horizon Wind Energy LLC (Horizon). Horizon develops, constructs, owns, and operates wind farms throughout North America. In the U.S., Horizon has developed more than 3,400 MW and operates over 2,800 MW of wind-powered facilities. Horizon is owned by EDP Renewables, S.A. (EDPR), a global renewable energy company with headquarters in Madrid, Spain.

HISTORY OF THE APPLICATION

Prior to formally submitting its application, the Applicant consulted with the Staff and representatives of the Board, including the Ohio Environmental Protection Agency (Ohio EPA), regarding application procedures.

On April 20, 2010, the Applicant held a public informational meeting in Haviland, Paulding County regarding the proposed wind-powered electric generating facility.

On May 14, 2010, the Applicant filed its application for a certificate to construct the proposed wind-powered electric generating facility in Paulding County, Ohio. In addition, the Applicant filed a Motion of Protective Order and a Motion for Waivers.

On June 21, 2010, the Administrative Law Judge issued an entry granting the Applicants waiver request, in accordance with certain conditions. In addition, the Administrative Law Judge granted the Ohio Farm Bureau Federation's motion to intervene.

On July 6, 2010, the Chairman of the Board issued a letter to the Applicant stating that the application had been found to comply with the requirements of Chapter 4906-01, et seq., OAC.

On July 15, 2010, the Administrative Law Judge issued an Entry scheduling a local public hearing for this case to take place on September 22, 2010, at 5:00 p.m., at the OSU Extension Center, 503 Fairground Drive, Paulding, Ohio 45879. The adjudicatory hearing was scheduled to take place on October 5, 2010, at 10:00 a.m., 11th floor, Hearing Room C, at the offices of the Public Utilities Commission of Ohio, 180 East Broad Street, Columbus, Ohio 43215.

In response to Staff data requests and interrogatories, the Applicant filed additional information that was not included in the application. This summary of the history of the application does not include every filing in case number 10-0369-EL-BGN. The docketing record for this case, which lists all documents filed to date, can be found in the Appendix to this report and online at <http://dis.puc.state.oh.us>.

PROJECT DESCRIPTION

The proposed project involves the construction and operation of a wind farm comprised of up to 98 wind turbines with a nameplate capacity of 1.5 MW to 1.8 MW each. The Applicant has proposed 98 turbine locations but may not construct turbines at all locations, depending on the generating capacity of the chosen turbine model. The project would have an aggregate generating capacity of up to 150.4 MW with an annual energy production between 395,000 to 460,000 megawatt-hours (MWh).

Project Area

The project area¹³ covers 15,000 acres of leased land in Benton and Harrison townships in Paulding County, near the villages of Payne and Antwerp. The project area and proposed facilities are shown on the maps in this report.

Wind Turbines

The Applicant has designed the project to accommodate four possible turbine models depending on availability and cost at the time of ordering. The Applicant proposes to use Acciona AW82 turbines which are rated at 1.5 MW, Vestas models V100 or V90 turbines which are both rated at 1.8 MW, or GE 1.6 xle turbines which are rated at 1.6 MW. The structures would consist of a three-bladed horizontal axis turbine and nacelle on top of a white monopole tubular steel tower. The total maximum height would vary by turbine model, ranging from 397 feet (121 meters) to 459 feet (140 meters). The hub height for the turbines would be 262 feet (80 meters), or 312 feet (95 meters) if the Vestas V90 is selected. The maximum rotor diameter would be 328 feet (100 meters).

Turbine Foundations

Test borings for the site-specific geotechnical investigation were completed in August 2010. Final turbine foundation design would be selected upon the results of the full site-specific geotechnical investigation. The Applicant is considering two typical designs for wind turbine foundation systems, the spread footer foundation or a rock-anchored, pile-supported foundation.

After the foundation is laid, each turbine tower would have an 18-foot diameter pedestal surrounded by a 12-foot gravel skirt around the base. Each turbine would have a 60 by 100-foot permanent crane pad. The Applicant would prepare a wind turbine assembly area by grading and removing vegetation within a 200-foot radius, with precautions taken to avoid sensitive ecological resources. The foundation construction process would proceed from hole excavation, outer form setting, rebar and bolt cage assembly, pouring and setting of the concrete, backfilling and compacting, through to site restoration.

Electric Collection System

An electric collection system would be installed to transfer energy from the wind turbines to the transformer substation and connection to the electric transmission grid. The 34.5 kV collection system would consist of 59 miles of underground cable buried to a minimum depth of 36 inches. A small portion of the collection system would be buried in the public rights-of-way along State

¹³ Project area refers to the overall project limits in which the Timber Road II Wind Farm will be located and constructed.

Route 114, county roads 106 and 124, and various township roads, while the majority would be buried on privately-owned land leased by the Applicant.

Electric Substation

The facility would include a four-acre substation. The two proposed sites for the substation are located south of State Route 114 approximately one-half mile east of Township Road 17. The substation would be designed to step-up the electricity from the 34.5 kV electric collection system to 138 kV. The substation would consist of a step-up transformer, switches, breakers, and a control house. The substation perimeter would be enclosed by a 400 foot by 325 foot chain link fence. The substation would then connect to AEP's Haviland-Milan 138 kV transmission line and interconnection substation.

O&M Buildings

The operations and maintenance (O&M) buildings would be used to house personnel and replacement materials. The Applicant has stated that a typical O&M building is 6,000 square feet. Eight possible locations are being considered for use as an O&M building.

Permanent Meteorological Towers

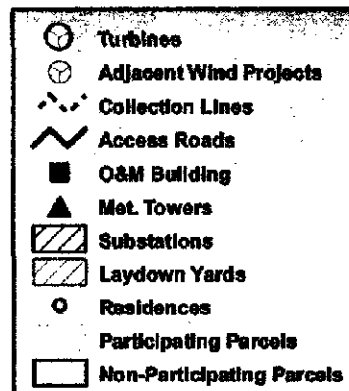
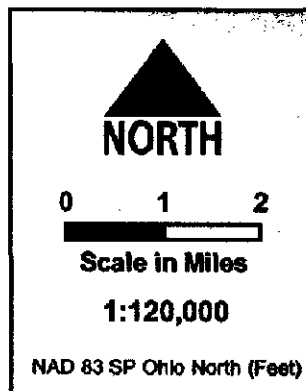
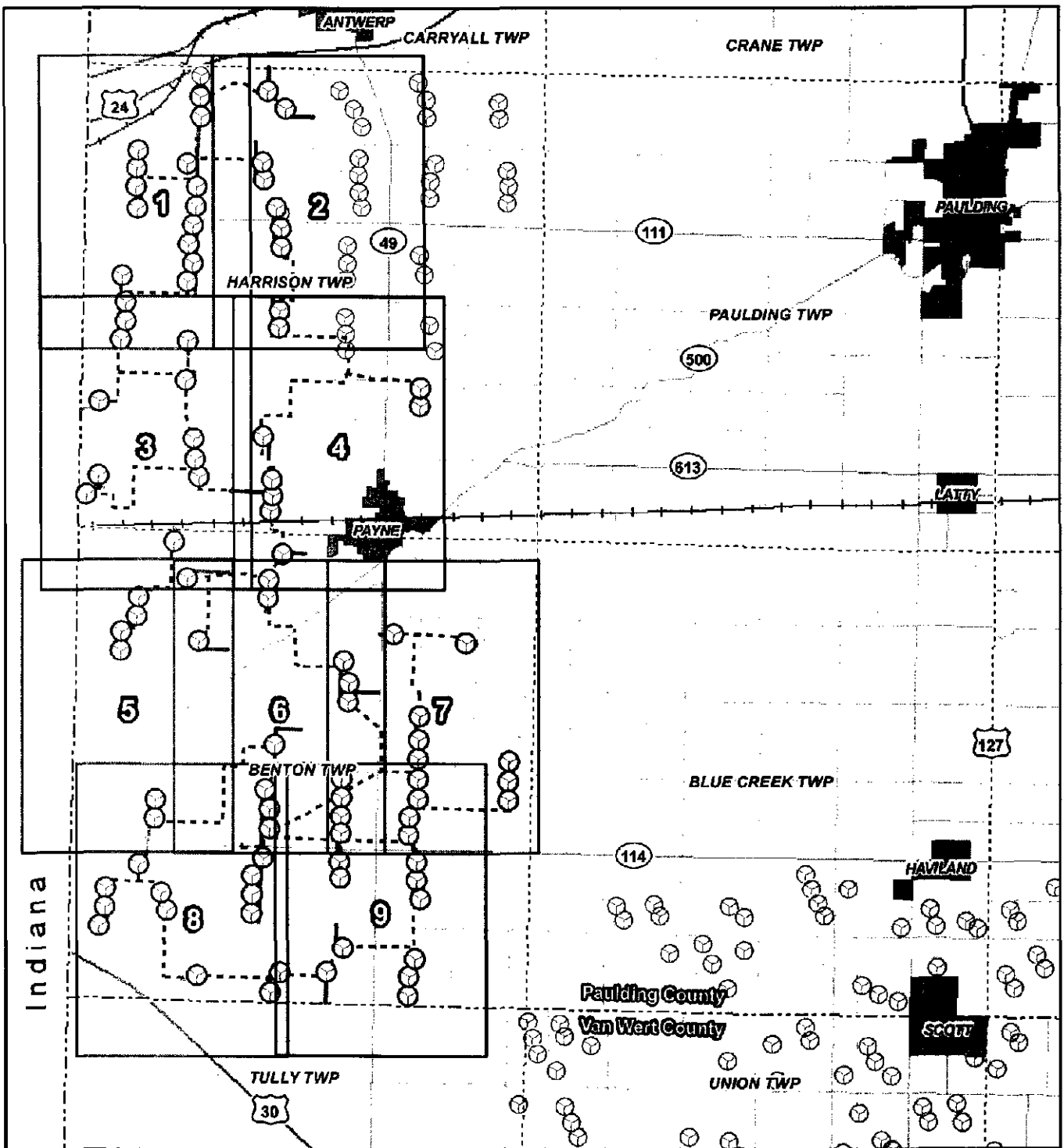
The Applicant may install up to three self-supporting 262-foot (80 meters) or 312-foot (95 meters) tall permanent meteorological towers to monitor wind resources during the operation of the wind farm. The towers would be galvanized steel structures equipped with wind velocity directional measuring instruments at three elevations and would have red aviation warning lights mounted at the top. Eight potential sites for the permanent meteorological towers were included in the application.

Access Roads

Approximately 30 miles of new or improved access roads would be needed to support the facility. The access roads would be up to 75 feet wide during construction. After construction, most access roads would be reduced to 16 feet wide, but up to a maximum of 40 feet wide in limited areas.

Construction Laydown Areas

The Applicant intends to deliver materials directly to each turbine construction site where there would be temporary laydown areas. The Applicant would use two of four proposed 22-acre laydown areas for material and equipment storage, construction trailers, and parking. Temporary parking lighting may be installed as part of the project.



Overview Map

10-0369-EL-BGN

**Timber Road II
Wind Farm**

Maps are presented solely for the purpose of providing a visual representation of the project in the staff report, and are not intended to modify the project as presented by the Applicant in its certified application and supplemental materials.

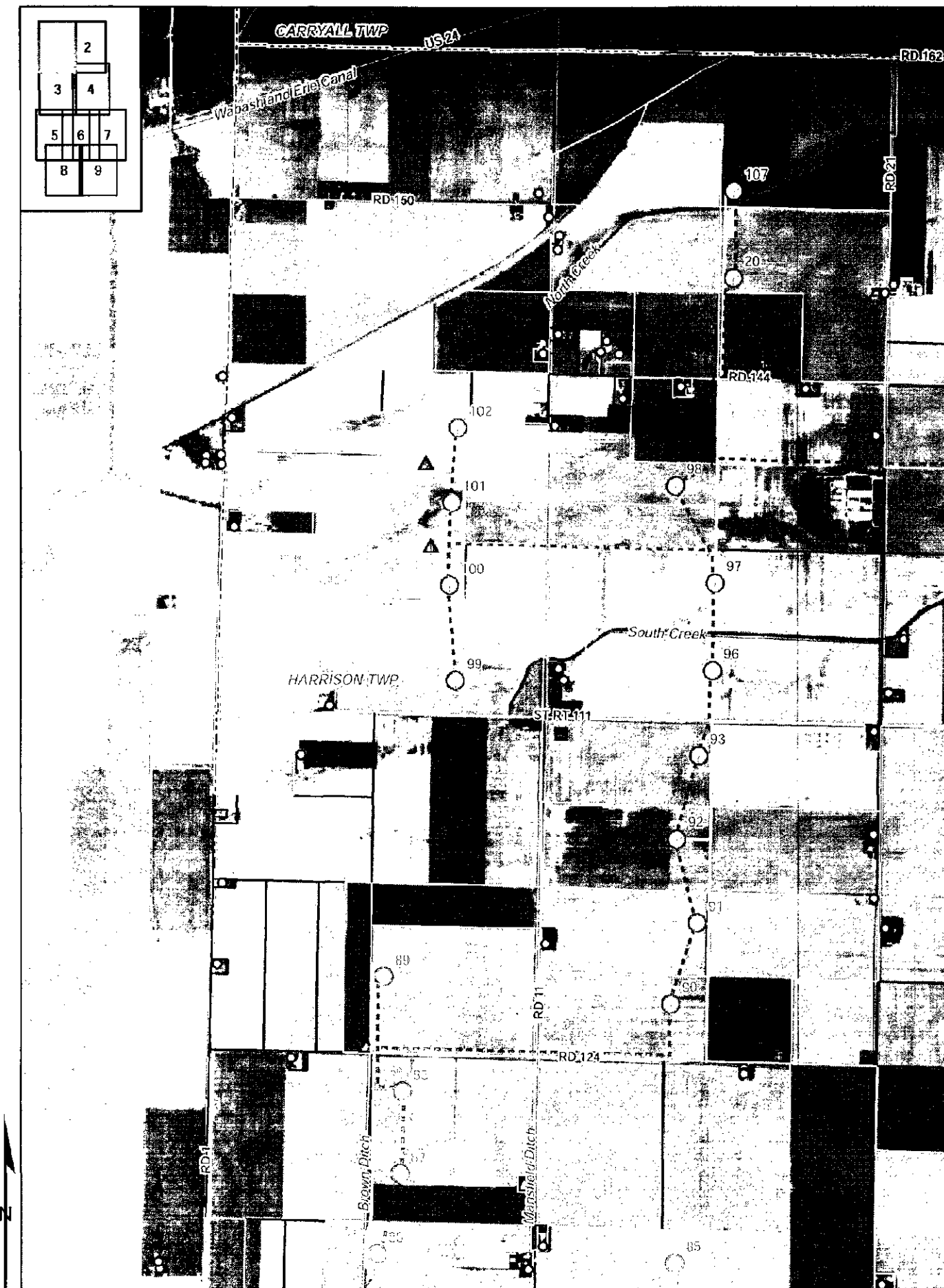


Figure 1

1 inch equals 2,000 feet

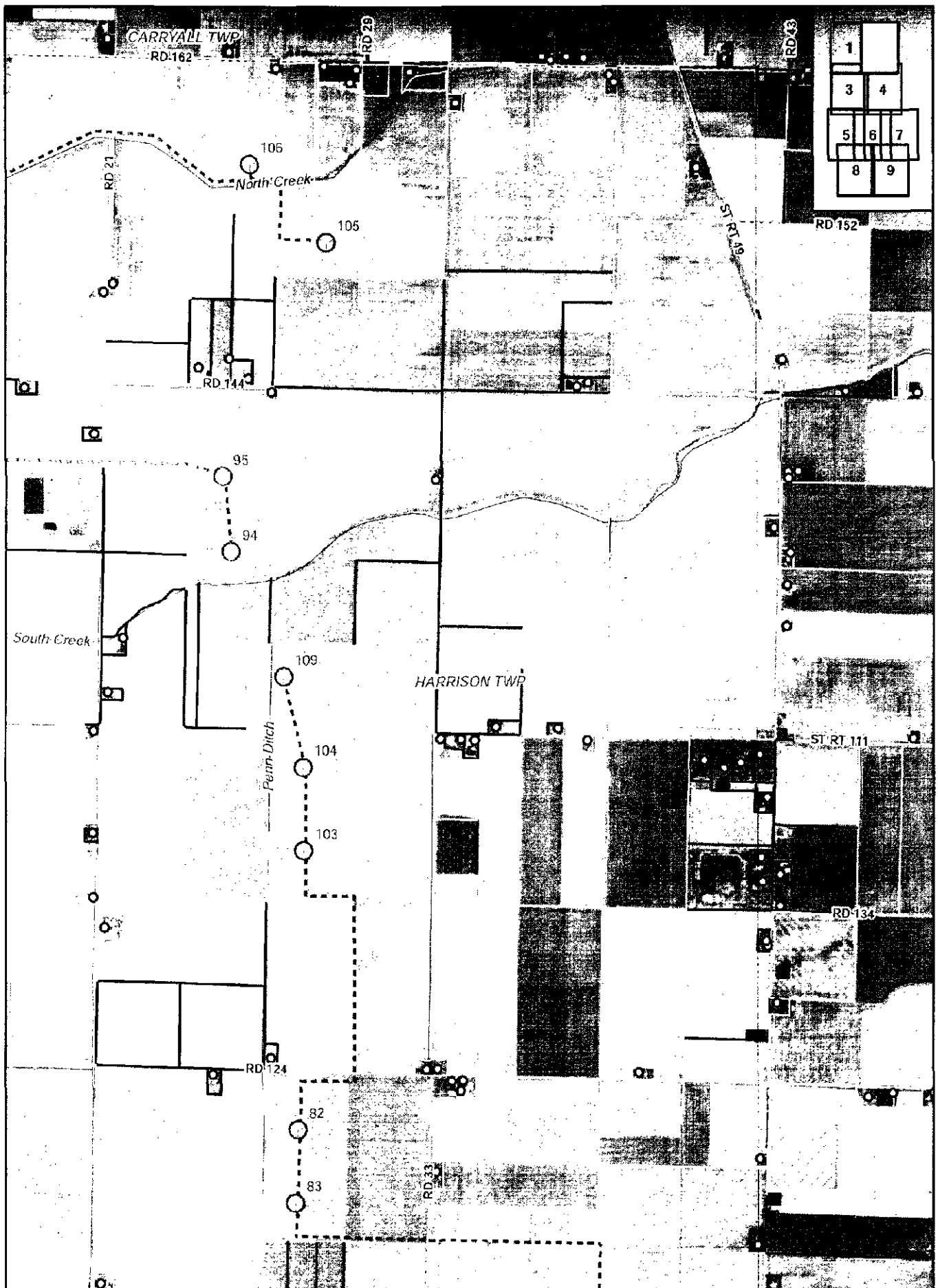


Figure 2

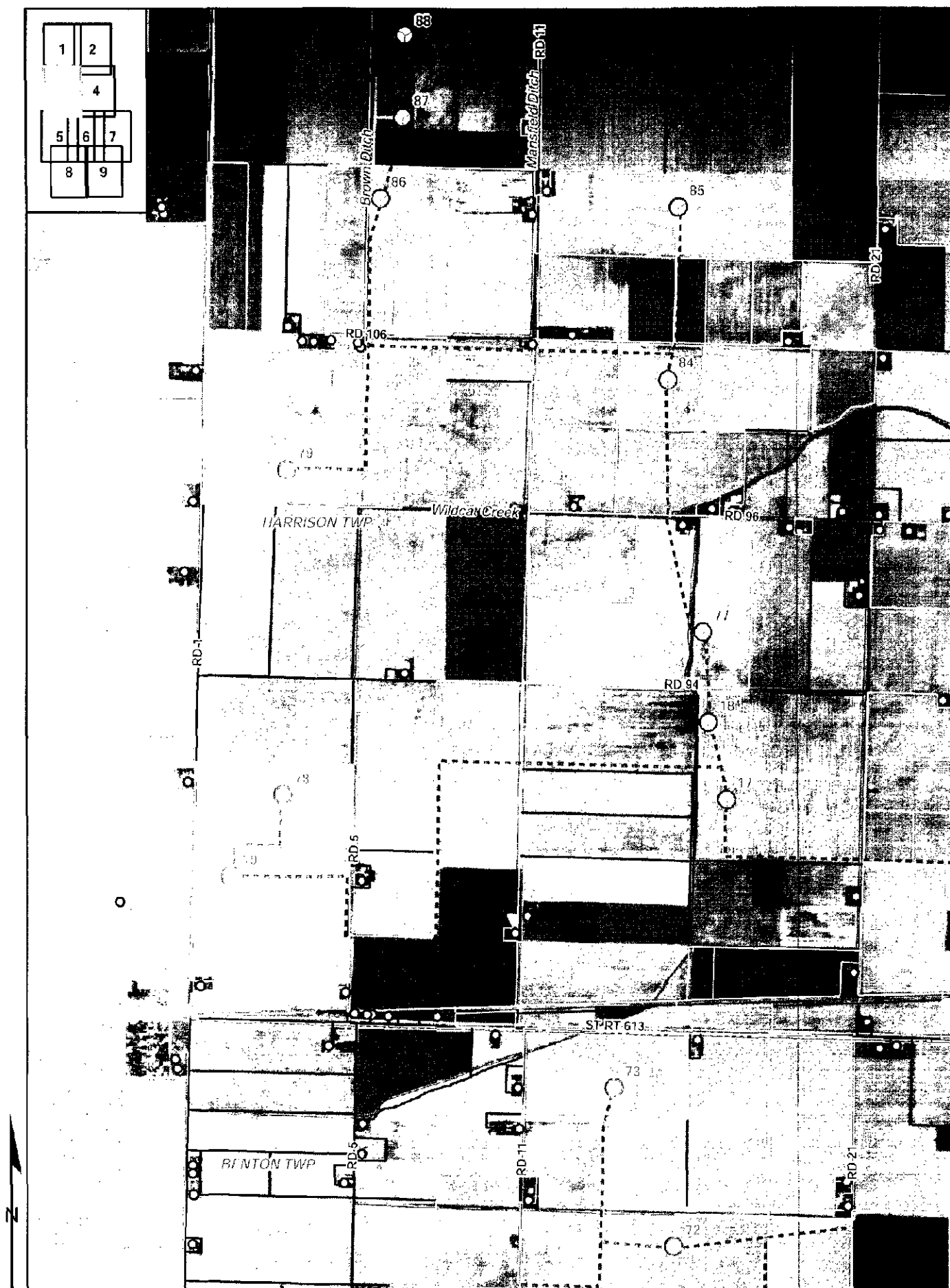


Figure 3

1 inch equals 2,000 feet

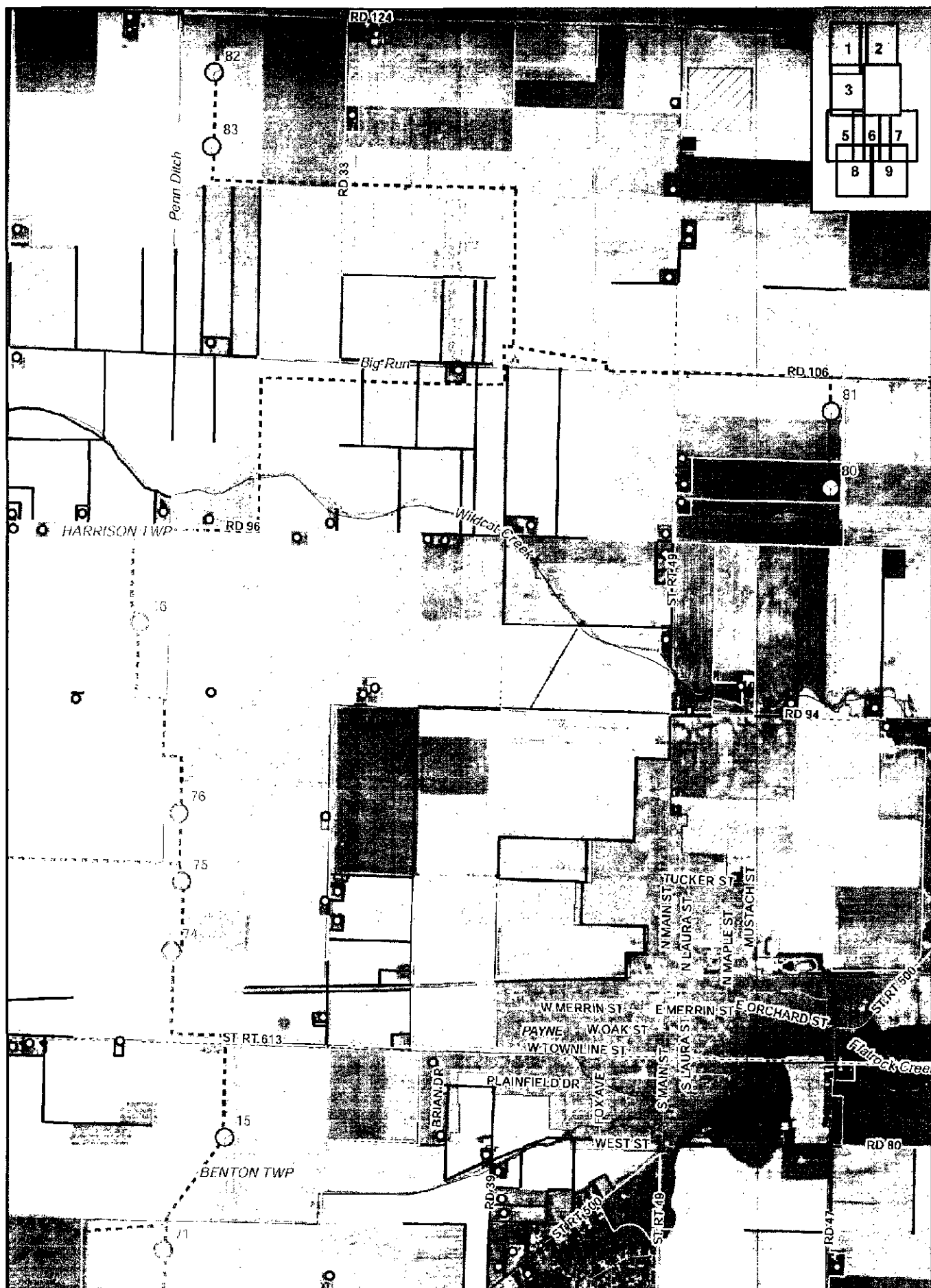


Figure 4

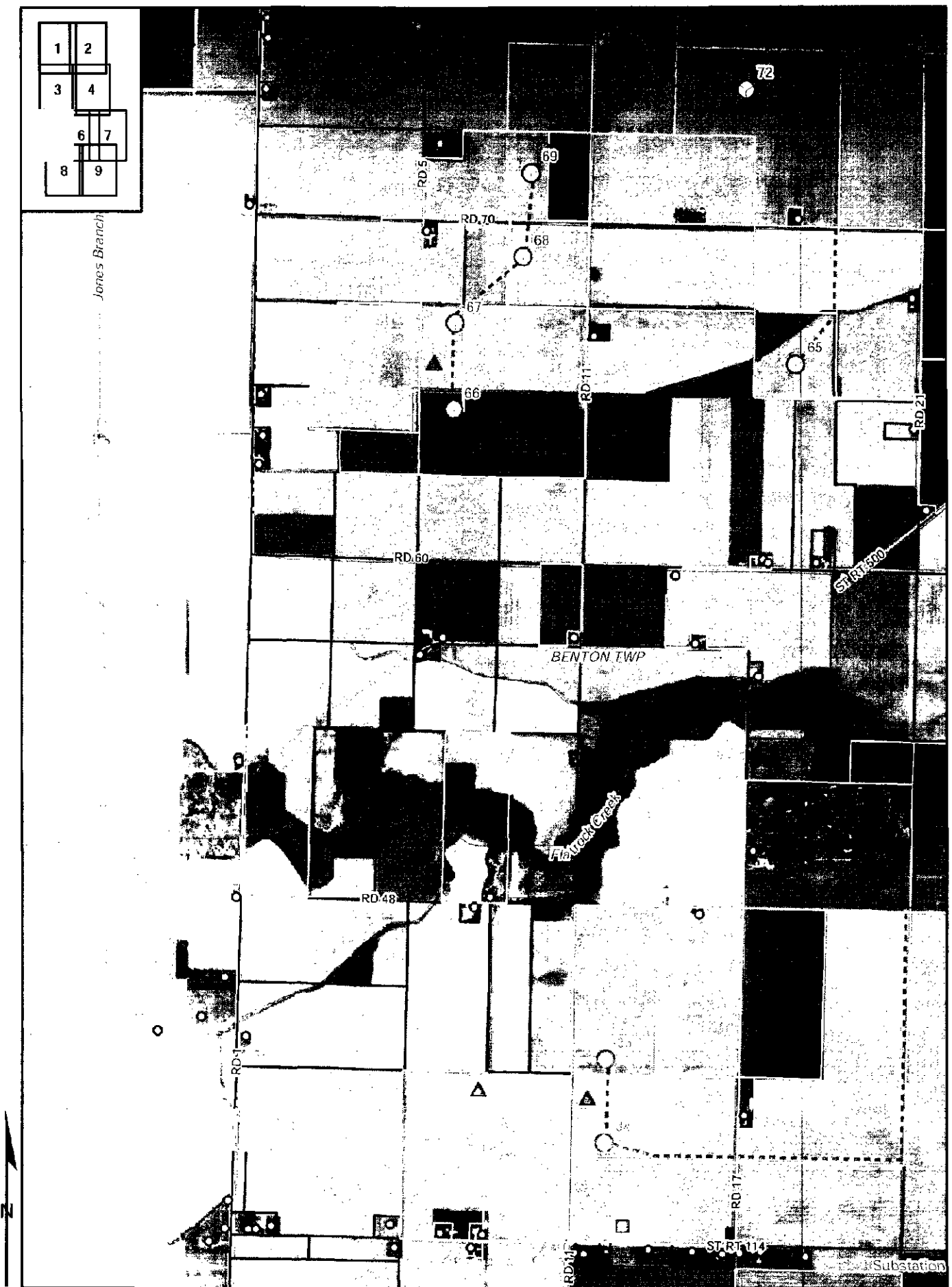


Figure 5

1 inch equals 2,000 feet

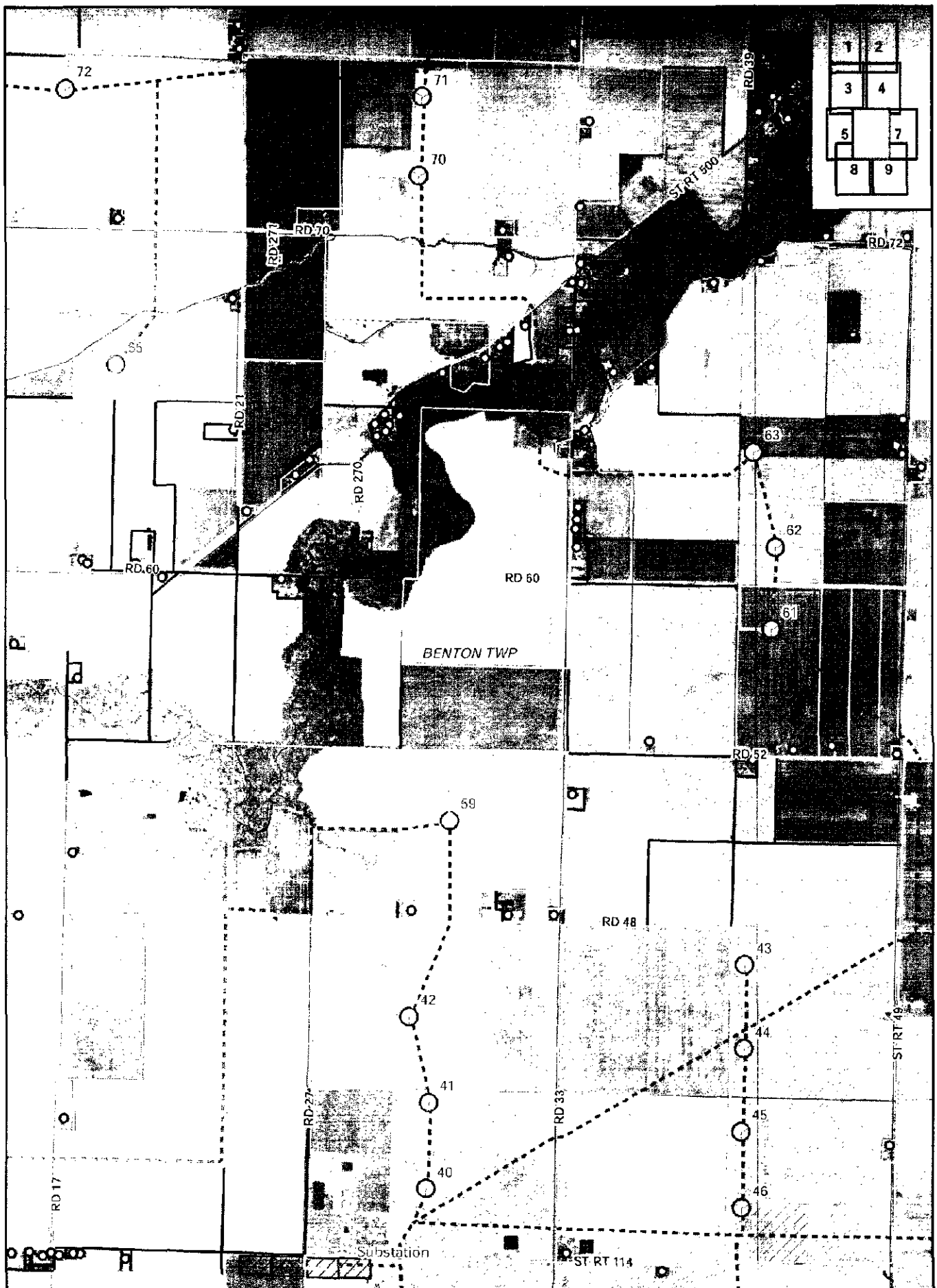


Figure 6

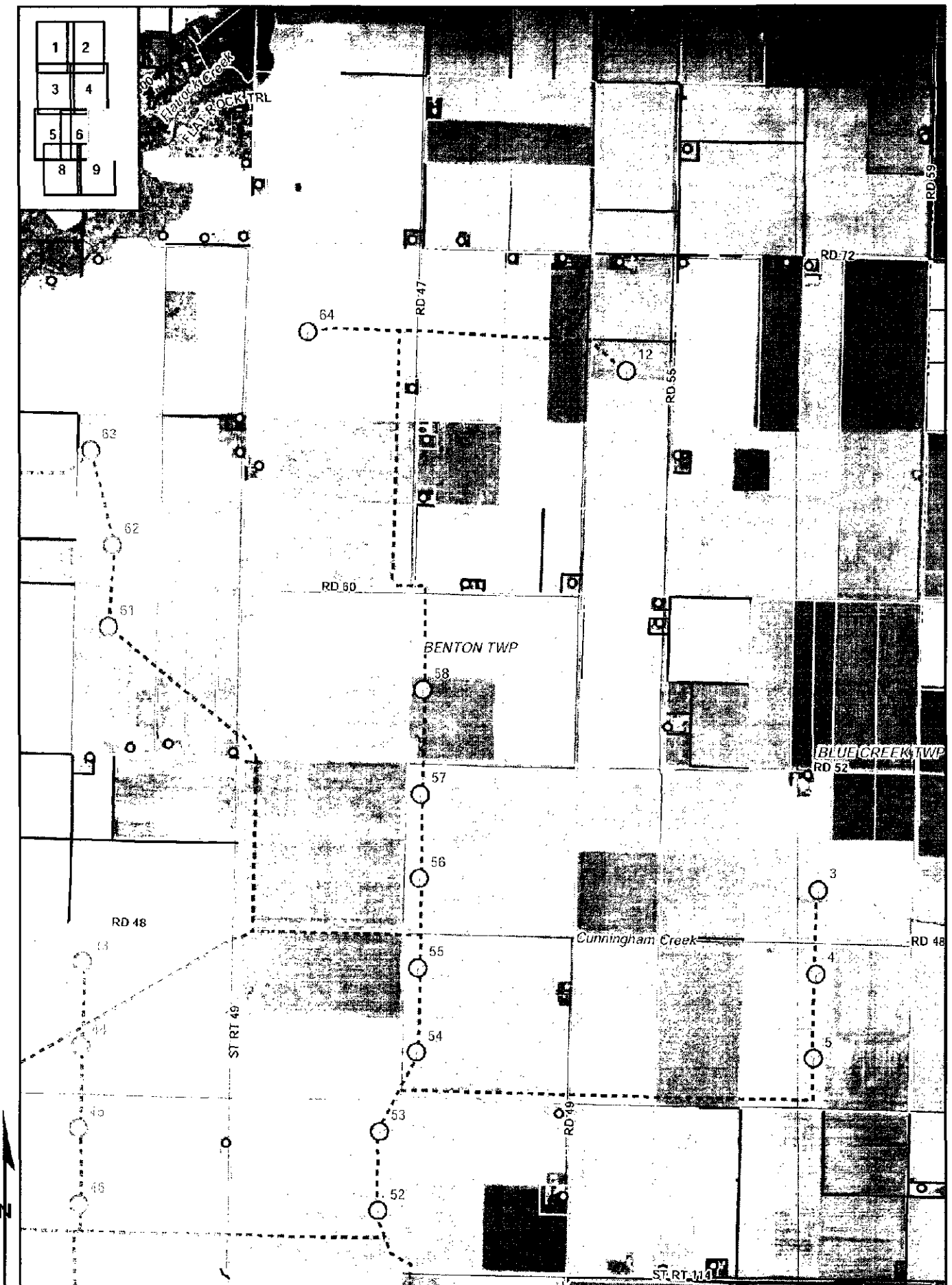
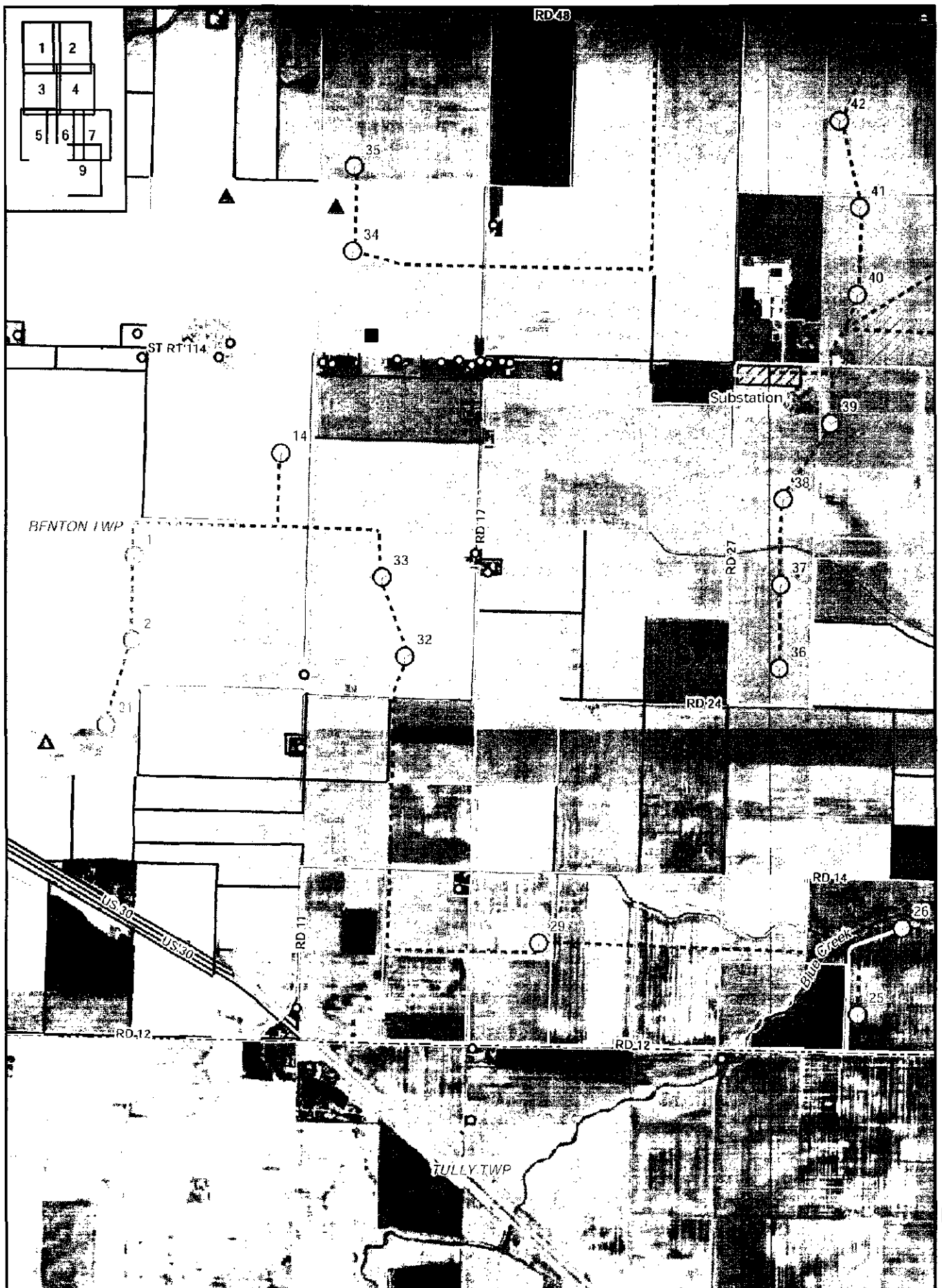


Figure 7

1 inch equals 2,000 feet



1 inch equals 2,000 feet

Figure 8

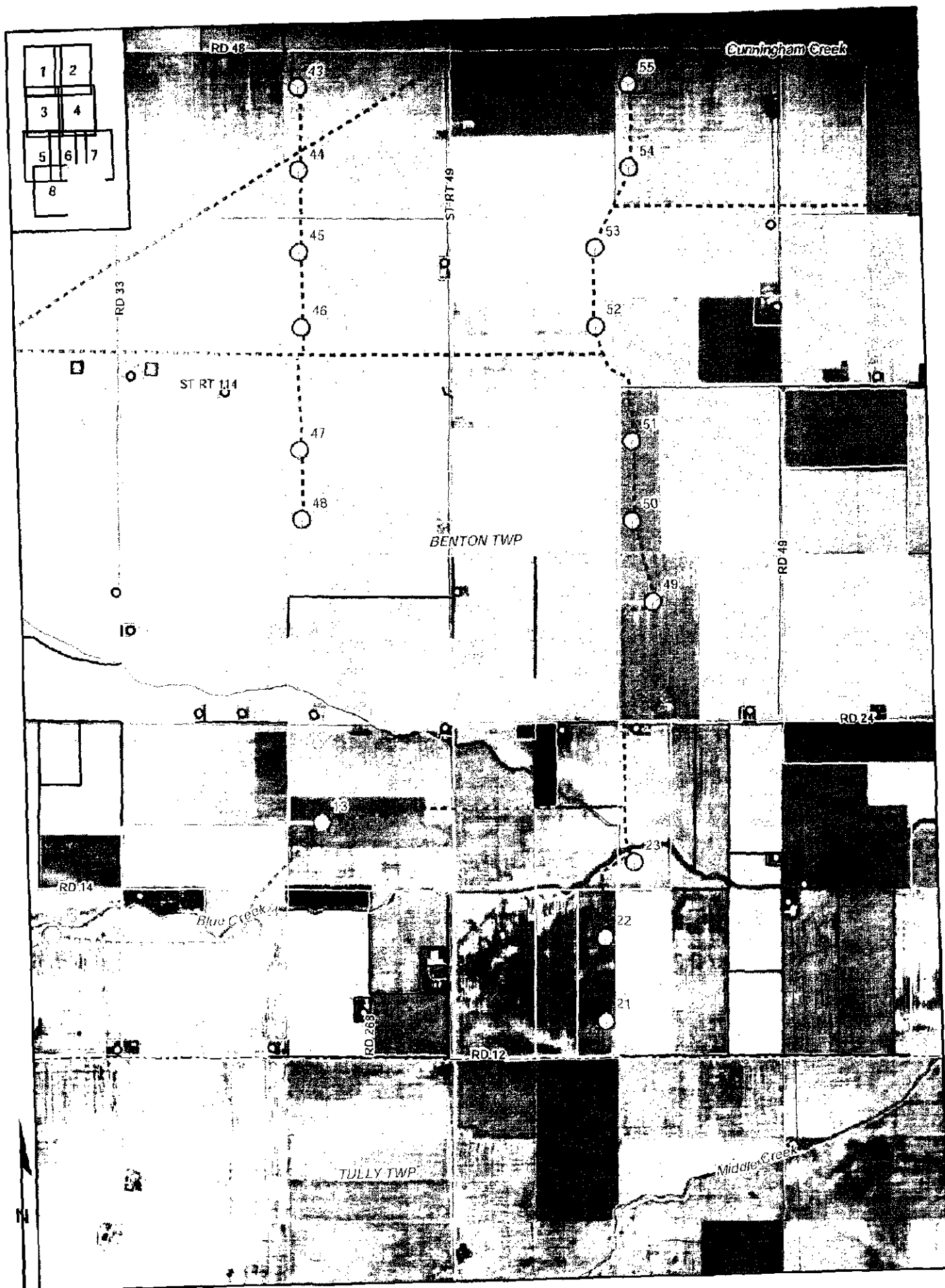


Figure 9

1 inch equals 2,000 feet

III. CONSIDERATIONS AND RECOMMENDED FINDINGS

In the matter of the application of Paulding Wind Farm II LLC the following considerations and recommended findings are submitted pursuant to ORC Section 4906.07(C) and ORC Section 4906.10(A).

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(1)

BASIS OF NEED

The basis of need as specified under ORC Section 4906.10(A)(1) is not applicable to this electric generating facility project.

Recommended Findings

Staff recommends that the Board find that 4906.10(A)(1) is not applicable to this electric generating facility project.

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(2)

NATURE OF PROBABLE ENVIRONMENTAL IMPACT

Pursuant to ORC Section 4906.10(A)(2), the Board must determine the nature of the probable environmental impact of the proposed facility. As a result, the Staff has found the following with regard to the nature of the probable environmental impact:

- (1) The proposed project involves the construction and operation of a wind farm comprised of up to 98 wind turbines and associated facilities in Paulding County. The project would have an aggregate generating capacity of up to 150.4 MW. The Applicant plans to install Vestas V90, Vestas V100, GE 1.6 xle, or Acciona AW82 wind turbines.
- (2) The project area is sparsely populated and is expected to lose population over the next 20 years. The project is entirely within the unincorporated areas of Harrison and Benton townships, which have an estimated 2010 population of 1,275 and a population density of 18 persons per square mile, compared to 47 persons per square mile in all of Paulding County.¹⁴ The village of Payne, located approximately one-half mile from the nearest turbine, has an estimated 2010 population of 1,352.¹⁵ Population in the Ohio communities within five miles of the project area is expected to decrease by an average of 12 percent by 2020.¹⁶ The project is not expected to limit future population growth or have a noticeable effect on the demographics of the region.
- (3) Within the project area, 191 of the 15,000 acres of leased land (approximately 1.3 percent) would be converted to facility components necessary for the purpose of electrical generation, while the rest would remain available to the landowner or land manager for agricultural use. There would be a temporary conversion of 775 acres of leased land during the construction process. The Applicant does not anticipate that any structures would be removed or relocated as a result of the project, and there are no plans for concurrent or secondary uses of the project area.
- (4) A total of 23.4 acres of temporary impacts and 4.9 acres of permanent impacts would occur to agricultural district parcels. The impacts to the agricultural district land would not be significant enough to affect the agricultural district designation of any of the properties within the project area.
- (5) The residential development within the project area is markedly comprised of single-family homesteads along rural roads. One residential structure is located within 100 feet of a proposed underground collection line. No residences are within 100 feet of any other proposed facility components. There are 105 residences located within 1,000 feet of a proposed access road, collection line, laydown yard, or O&M facility. No structures or inhabited dwellings would need to be removed as part of this project.

¹⁴ Environmental Systems Research Institute. (2010). *USA Population Density*. Retrieved August 12, 2010 from the ESRI Web site:
http://resources.esri.com/arcgisonline/services/index.cfm?fa=content_detail&contentID=3C8393A4-1422-2418-A01E362F9E6E1A8E

¹⁵ *Ibid.*

¹⁶ Gourguechon, Jacques. (2010). *Assessing the Economic Impacts of Timber Road II Wind Farm*. Figure 3, p. 6, Application Exhibit H. Chicago: Camiros, Ltd.

- (6) Based on the largest proposed turbine model, the statutory minimum setback requirements equate to 505 feet from non-participating property lines and 914 feet from residences on non-participating property. The Applicant has designed the wind farm to exceed all statutory setback requirements.
- (7) The Applicant and Staff have reviewed local and regional land use plans and do not expect the project to conflict with known plans.
- (8) There are no state or national parks, forests, wildlife management areas or refuges, or national natural landmarks within a five-mile radius of the proposed facility. There is one Ohio Scenic Byway (Lincoln Highway Historic Byway) located in the south-eastern portion of the study area. Original sections of the byway are present in the western and central portions of the study area. However, the majority of this byway has been replaced by a modern four-lane highway. There are 13 recreational areas within five miles of the proposed facility, including Edgewood Park, Union Center Memorial Park, County Tee Driving Range, Monroeville Community Park, Woodburn Community Park, Riverside Park, Pond-A-River Golf Course, Antwerp Community Park, Payne Community Park, School Park, Pleasant Valley Golf Course, Church of God Campground, and Maumee River. Of those, there are four within one mile of the proposed facility: Maumee State Scenic River, Church of God Campground, Pleasant Valley Golf Course, and School Park. The Church of God Campground and the Pleasant Valley Golf Course are participating landowners. The Applicant evaluated the visual, sound level, and shadow flicker impacts for each of the recreational areas identified within one mile of the proposed facility and has determined that impacts would be limited to indirect, visual impacts.
- (9) The Applicant conducted a literature review and cultural records check for the area within a five-mile radius of the project. There are no National Historic Landmarks or National Register of Historic Places (NRHP) historic districts located within the study area. There is one historic property listed in the NRHP, the Antwerp Norfolk and Western Railroad Depot, which is located in the village of Antwerp. There are seven individual properties determined eligible for listing in the NRHP. Within the five-mile study area, 290 previously identified historic structures are recorded in the Ohio Historic Inventory (OHI), most of which are located within the village of Antwerp, while 27 are located within or adjacent to lands leased for the facility.
- (10) Of the 85 archaeological sites recorded in the Ohio Archaeological Inventory (OAI) within the five-mile study area, only six are within or adjacent to the lands leased for the project. There are 27 cemeteries in the Ohio Genealogical Society (OGS) database within five miles of the project area, six of which are located on the lands leased by the Applicant for the project. One unmarked grave was identified but is not located within the project area boundary. No known archaeological sites or cemeteries will be disturbed as a result of the project.
- (11) In addition to the literature and database review, the Applicant performed a Phase I archaeological reconnaissance survey and Phase I history/reconnaissance survey to analyze potential impacts of previously undocumented cultural resources within five miles of the project area. The Phase I survey identified two new prehistoric archaeological sites, six new historic archaeological sites, and one new multi-component prehistoric and historic site.

- (12) The Applicant submitted capital and intangible costs for Staff review. The installed project costs compiled by the U.S. Department of Energy National Renewable Energy Laboratory (NREL) indicate the capital costs of this proposed facility fall within industry trends. These costs would be incurred within a one to two year time period after construction begins. The majority of O&M costs would exclude ongoing expenses related to environmental monitoring, property taxes, land royalties, reverse power, and insurance. These costs were also submitted for Staff review.
- (13) Construction of the facility would add approximately 420 full-time jobs in the local economy. Wages and salaries, combined with increased local expenditures (direct, indirect, and induced impacts), are estimated to have a total local benefit of \$53.9 million during the eight-month construction phase. Operation and maintenance of the facility would add 43 full-time jobs in the local economy, totaling \$1.6 million in wages and salaries. Operation and maintenance of the wind farm is estimated to generate another \$4.0 million in local expenditures (direct, indirect, and induced impacts) for a total annual benefit of \$5.6 million to the local economy.
- (14) The Applicant conducted wetland and surface waters reconnaissance within the project area¹⁷ and determined that 92 wetlands occurred within the survey areas¹⁸ of the project. The vast majority of the wetlands were considered linear emergent freshwater wetlands confined to ditches. Three wetlands were considered to be isolated¹⁹ and no vernal pools were observed. To date, the U.S. Army Corps of Engineers (USACE) has not verified the water resources as either "waters of the U.S.,"²⁰ isolated wetlands, or non-jurisdictional features. The Applicant plans to temporarily or permanently impact 69 of the 92 non-verified wetlands. There would be no impacts to isolated wetlands or vernal pools.
- (15) A total of 20 streams were observed within the survey areas during field investigations. Many of these watercourses are unnamed tributaries that convey surface water runoff between and around agricultural fields to North Creek, South Creek, Wildcat Creek, Blue Creek, and Flatrock Creek, which drain to the Auglaize River and the Maumee State Scenic River. The proposed facility would directly impact 12 streams from the installation of culverts for new access roads, temporary gravel roads, and the placement of underground electric collection cables. The USACE has not yet verified these resources as waters of the U.S. Some impacts include minor loss of riparian vegetation, damage to the stream bank and stream bed, erosion, and sedimentation.
- (16) No ponds or lakes are expected to be impacted by this project.

¹⁷ The Applicant defines the project area in the ecological studies as the "wind resource area".

¹⁸ *Survey areas* refers to the physical extent in which the Applicant conducted ground-level reconnaissance of wetlands, streams, and ponds and lakes. The reconnaissance was conducted to verify the presence and approximate extent of such features within the area that could be directly disturbed for construction or operation of the project. The survey areas are smaller than the project area but larger than the area that would likely be disturbed during construction and operation of the facility.

¹⁹ *Isolated wetland* means a wetland that is not subject to regulation under the Federal Water Pollution Control Act. Resources determined to be isolated by the USACE are subject to Ohio EPA 401 permitting, if impacted, under the provisions of the Ohio Isolated Wetland Rules outlined in ORC 6111.02-.028.

²⁰ *Waters of the United States (U.S.)* include those waters listed in §328.3(a). The lateral limits of jurisdiction in those waters may be divided into three categories, including the territorial seas, tidal waters, and non-tidal waters (see 33 CFR 328.4 (a), (b), and (c), respectively). Water resources considered by the USACE as waters of the U.S. are subject to USACE 404 permitting if impacted below ordinary high water mark (OHWM).

- (17) No woodlots would be cleared for this project. Minimal herbaceous vegetation would be cleared or impacted during construction.
- (18) The Applicant met with representatives of the USFWS and the ODNR Division of Wildlife (DOW) during early planning stages of the project. In general, the DOW encourages the development of wind turbine facilities within areas of extensive agriculture. The lack of suitable habitat decreases the likelihood of impacting either flora or fauna during construction, operation, or decommissioning phases. Based on the project's proposed location and the habitat contained within the project area, the DOW determined that "minimum" pre-construction avian and bat survey requirements were appropriate. During its surveys, the Applicant met or exceeded all of the survey guidelines recommended by the DOW.
- (19) The project area is comprised of almost exclusively agricultural land, and therefore provides limited high-quality diverse wildlife habitat. However, portions of the project area do contain habitat likely to support numerous common reptilian, amphibian, avian, and mammalian species. These species would likely be impacted, both directly and indirectly, during the construction, operation, and maintenance of the proposed facility. Faunal impacts would include the loss of habitat, increased disturbance (e.g., noise, lighting, human activity), and temporary and permanent displacement. In addition, operational impacts may include bird and bat mortalities through either direct strike or barotraumas.²¹
- (20) The Applicant requested information from the ODNR Division of Natural Areas and Preserves (DNAP) and the USFWS on September 18, 2008, regarding state and federally-listed threatened and endangered plant and animal species. Additionally, during field assessments of the survey areas, the Applicant surveyed for listed plant and animal species. The following are the results of the data request and field assessments as it relates to impacts associated with this project:
- (a) Plants: This project does not lie within the known range of any federally-listed plant species. DNAP did not find any listed plant records in the Natural Heritage Database (NHD) within 0.25 miles of the project area. Additionally, the Applicant did not identify any listed plant species during field assessments. Due to the project type, location, and lack of suitable habitat for listed plant species within the project area, impacts to listed plant species would not be expected.
- (b) Birds: This project lies within the known range of the bald eagle (*Haliaeetus leucocephalus*), a state-endangered and federal species of concern. Due to the project type, location, and lack of nests within five miles of the project, the USFWS determined that impacts to this species would not be expected. DNAP did not find any listed avian species records in the NHD within 0.25 miles of the project area. However, the NHD search revealed a small great blue heron rookery (10-15 nests) within the Flatrock Creek riparian corridor, which is located within the project area. Due to the project location and the Applicant's dedication to locating turbines greater than one-half mile from Flatrock Creek and its associated riparian corridor, it was determined that impacts to this species or the rookery would not be expected.

²¹ Barotraumas are any of several injuries arising from changes in pressure upon the body.

To assess the potential impacts to avian species, the Applicant reviewed existing data and conducted on-site surveys in accordance with recommendations by the DOW and the USFWS. These on-site efforts consisted of fixed-point bird use surveys and raptor nest surveys. No federally-threatened or endangered species were observed during the surveys. The Applicant identified, through limited sightings, the presence of the state-endangered northern harrier (*Circus cyaneus*), the sandhill crane (*Grus canadensis*), and the American bittern (*Botaurus lentiginosus*); the state-threatened dark-eyed junco (*Junco hyemalis*); three state species of interest including the blue grosbeak (*Guiraca caerulea*), Wilson's snipe (*Gallinago delicata*), and the western meadowlark (*Sturnella neglecta*); and the bobolink (*Dolichonyx oryzivorus*), a state species of concern. The USFWS does not believe this project poses a substantial threat to migratory birds, based on the lack of suitable habitat for these species and the disturbed nature of the project area. However, mortality of migratory birds should be expected to occur.

- (c) Reptiles: This project lies within the known range of the federal candidate and state-endangered eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*). Due to the project type and agricultural disturbance of the project area, the DOW and the USFWS have determined that this species would not be located within the project area, and impacts to this species would not be expected.
- (d) Mammals: This project lies within the known range of the state and federally-endangered Indiana bat (*Myotis sodalis*). The Applicant has indicated that no suitable summer roosting or rearing habitat would be removed as a result of this project, and no known or suspected hibernacula are located within 10 miles, nor do any positive capture records occur within five miles of the project area. Based on comments received from the USFWS relative to the results of the avian and bat surveys, "take"²² is not expected to occur pursuant to the Endangered Species Act (ESA) section 9 provisions, and therefore impacts to this species would not be expected with this project. To reduce the risk of an incidental taking of Indiana bats, the DOW and the USFWS have suggested the use of seasonal tree clearing restrictions between April 1 and October 1.
- (e) Aquatic Species: This project does not lie within the range of any federally-listed aquatic species. The DOW has identified a record for the state-endangered greater redhorse (*Moxostoma valenciennesi*), a fish species that exists near the project area. Due to the distance of this project to known records and the mobility of this species, impacts to this species would not be expected.

This project also lies within the historically known range of mussel species including the state-endangered purple lilliput (*Toxolasma lividus*), the state-threatened pondhorn (*Uniomercus tetralasmus*), and the deertoe (*Truncilla truncate*), a state species of concern. The purple lilliput record was found in a tributary to Flatrock Creek near the project boundary. Additionally, there are several records of common mussel species in

²² Take is to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct [ESA §3(19)]. Harm is further defined by the USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by the USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering [50 CFR §17.3] (USFWS, 1998).

Flatrock Creek where it flows through and downstream of the project area. In an effort to identify mussels that occur in reaches of streams that would be impacted by construction activities associated with the project, ODNR and OPSB Staff would require the Applicant to retain an ODNR-approved malacologist.²³ The malacologist would perform a mussel presence/absence survey of the appropriate stream reaches to determine the likelihood of impacts to all mussel species and provide appropriate avoidance, minimization, and mitigation measures that would be implemented prior to and/or during construction of this project.

- (f) Other Species: This project lies within the known range of the plains clubtail (*Gomphus externus*), a state-endangered dragonfly. Due to the mobility of this species, the DOW has determined that this project is not likely to impact this species.
- (21) The Applicant and Staff do not anticipate impacts to public or private water supplies from the proposed project. The Applicant would conduct unanticipated spill response training for construction and O&M staff as needed to limit the potential for impact.
- (22) The Applicant has stated that no turbines or access roads would be located within the Federal Emergency Management Authority 100-year floodplain. A small portion of the electric collection system would be constructed within the floodplain, but would not impact the floodway or increase the 100-year flood base elevation discharge.
- (23) The Applicant has performed a preliminary geotechnical investigation for the project area in order to determine soil and bedrock conditions, obtain geotechnical design data, and undertake a preliminary foundation design. The findings indicate that significant mitigation would not be needed for geologic considerations. Final geotechnical investigations will be undertaken in advance of construction and will focus on specific locations of the final design. These investigations would allow for planning of any unusual foundation conditions.
- (24) The project area is accessible through numerous highways, state routes, and local roads. During construction, some roads near the project would experience an increase in truck traffic due to the delivery of turbine components, concrete, gravel, and heavy equipment to each turbine site. Workers commuting during construction would also increase traffic. The Applicant does not expect operation of the wind farm to noticeably increase local traffic or impact other local services.
- (25) Wind farm construction activity would impact local roads and bridges. The pavement condition of the state, county, and township roads along the regional delivery route could be impacted by construction and material delivery equipment. Truck loads heavier than the state legal limit may impact the existing state, county, and township bridges.
- (26) The large turning radius required for the transport of long wind turbine generator components may cause the truck and/or trailer to travel outside of the existing pavement at intersections. The wide turns would impact the features around most intersections where turns are required, including ditches, signs, and utility poles. In some locations where wide turns are required, temporary alterations to the intersection could be required, including installation of gravel fill outside of the pavement limits as a temporary surface for

²³ Malacologist refers to a professional biologist that studies molluscs. Mollusc is a synonym for freshwater mussels.

truck/trailer turns, installation of drainage pipes in these fill locations as an alternate means of draining, and relocation of utility poles, signs, and other installations.

- (27) The Applicant expects that post-construction and operational impacts to roads and bridges would be limited, as the roads would be able to handle any traffic from operational or maintenance requirements that the Applicant may need to perform on the wind turbine generator components.
- (28) Air emissions during construction could include nitrous oxides, sulfur dioxide, carbon dioxide, carbon monoxide, lead, particulate matter, and volatile organic compounds. Because of the low volume of emissions and the temporary nature of construction activities, these emissions are not expected to cause significant adverse impacts. No significant air emissions would result from operation of the proposed facility.
- (29) Noise impacts from construction activities would include the operation of various trucks and heavy equipment. Impacts from construction noise would be temporary and would be primarily restricted to daylight hours.
- (30) The Applicant conducted baseline sound measurements at three points within the project area in order to estimate the actual ambient noise levels. Recorded ambient noise levels (L_{EQ})²⁴ across these three points ranged from 35 to 53 decibels (dBA) and the ambient (L_{90})²⁵ ranged from 26 to 46 dBA. The data provided equates to an average project area nighttime (L_{EQ}) of 41 dBA.
- (31) The Applicant states that during full sound power conditions, the operational sound output for the project would range between 25 to 47 dBA at residences within the project area. The sound output is expressed as a range due to certain environmental and atmospheric conditions that can further propagate or amplify levels of generated noise. The Applicant also modeled the cumulative impacts of the Timber Road II project and adjacent proposed wind projects. This cumulative study provided the same range, 25 to 47 dBA, for expected sound levels at residences within the Timber Road II project area.
- (32) The Applicant's shadow flicker simulation identified eight receptors within 1,000 meters that were modeled to receive 30 hours or greater per year of shadow flicker. Seven of these receptors are inhabited residences and project participants, while the remaining receptor is an uninhabited structure and a non-participant. The maximum predicted shadow flicker impact at any receptor is approximately 42 hours per year.
- (33) According to the Applicant's communications study, the television stations most likely to produce off-air coverage to Paulding County are those at a distance of 40 miles or less from the center of the project area. The study identified 63 stations within a 40-mile radius. Specific impacts to TV reception could include noise generation at low channels in the very-high frequency (VHF) range within one-half mile of turbines, and reduced picture quality. However, the transition to digital signal has reduced the likelihood of these effects occurring.
- (34) Eight licensed AM stations are located within a 25-mile radius of the project area center point. The closest distance from an AM station antenna to a wind turbine is greater than two

²⁴ L_{EQ} refers to the equivalent continuous sound level, or average sound level, over a specific period of time.

²⁵ L_{90} refers to the sound level that is exceeded 90 percent of the time.

miles. The Applicant does not anticipate any degradation of AM broadcast coverage as a result of this project.

- (35) There are records of 22 licensed and operational FM stations within a 25-mile radius of the project area center point. The closest station is greater than 2.5 miles away from the project center point. The Applicant does not expect any impact to FM broadcast coverage as a result of this project.
- (36) The Applicant identified three microwave paths near the project area. Based upon the calculated worst-case scenario and subsequent analysis, the Applicant expects three proposed turbine locations (15, 17, and 76) to obstruct the identified microwave paths. The Applicant will be required to mitigate impacts to microwave paths.
- (37) Wireless telephone network communications should be unaffected by wind turbine presence and operation.
- (38) Ice throw is the phenomenon where accumulated ice on the wind turbine blades separates from the blade and falls or is thrown from the blade. The Applicant states that ice fragments typically land within 100 meters (328 feet) of the wind turbine tower and the risk from ice throw is negligible beyond 220 meters (722 feet). The shortest distance between a turbine base and a residence is greater than 1,400 feet.
- (39) All of the turbines under consideration cut-out²⁶ at wind speeds of 25 meters per second (m/s), or 56 miles per hour (mph), or less. All proposed turbine models are certified by the International Electrotechnical Commission to withstand high wind speeds of at least 37.5 m/s, or 84 mph.
- (40) The Applicant has addressed safety with respect to individual wind turbines and the project as a whole. The turbines selected by the Applicant would have a supervisory control and data acquisition (SCADA) system, potential gates along access roads to turbines, and locked tower doors. The project would include a substation with a locked security fence, substation transformer fire suppression system, a lightning protection system, and would comply with NFPA 70E standards and OSHA requirements. The Applicant has provided a copy of the manufacturers' safety manuals for Staff review.
- (41) The proposed facility would be decommissioned once it is no longer operational. Decommissioning is generally a reversal of previous construction actions and includes the dismantling and removal of all towers, turbine generators, transformers, and overhead cables; removal of underground cables; removal of foundations, buildings, and ancillary equipment; removal of surface road material; and restoration of the roads and turbine sites to the same physical condition that existed immediately prior to erection of the commercial wind-powered electric generating facility. The Applicant has proposed the posting of a bond or equivalent financial security in the amount of \$25,000 per turbine after ten years of operation to ensure that funds are available to complete decommissioning. Any decommissioning costs in excess of this amount would be covered by the salvage or resale value of the wind generators.

²⁶ *Cut-out* wind speed refers to the wind speed at which a wind turbine ceases to produce energy.

Recommended Findings

The Staff recommends that the Board find that the nature of the probable environmental impact has been determined for the proposed facility, and therefore complies with the requirements specified in ORC Section 4906.10(A)(2), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(3)

MINIMUM ADVERSE ENVIRONMENTAL IMPACT

Pursuant to ORC Section 4906.10(A)(3), the proposed facility must represent the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, along with other pertinent considerations.

Site Selection

The Applicant has determined that the project area is an ideal location with adequate wind resources for a viable wind energy project. Statewide wind resource data from AWS Truewind was initially evaluated by the Applicant to determine areas with sufficient wind resources in the state of Ohio. The Applicant then used on-site meteorological towers and high-resolution terrain data from a digital elevation model to confirm adequate wind resources at the site.

In addition to the wind resource, the Applicant identified numerous factors that were key to the site selection process for the facility, including proximity to the bulk power transmission system and major transportation routes, and a location that could accommodate setback, land use, and environmental restrictions. For the initial evaluation, the Applicant utilized available data as well as site visits and capacity analysis for transmission lines located near the site. Further evaluations of the proposed site included the availability of willing land lease participants, appropriate geotechnical conditions, limited residential development, compatible land use, impact to sensitive ecological resources, and impact to existing cultural resources.

Once the site was chosen, additional considerations were implemented regarding the siting of individual wind turbines located within the proposed site. The Applicant evaluated residential, property line, and right-of-way setbacks, wind resource assessments using on-site meteorological towers and high-resolution terrain data, agricultural land, noise, shadow flicker, wetlands, and landowner considerations.

Socioeconomic Impacts

Land Use

The land use within a five-mile radius of the proposed facility is predominantly agricultural and would not be significantly impacted by the project. Agricultural land offers an unvarying landscape and a habitat that is unsuitable for most wildlife. In addition, the topography is appropriate for and conducive to large and heavy equipment necessary during construction activities.

The Applicant would mitigate the land use impacts of the facility in several ways. Facility components have been sited along hedgerows and field edges wherever possible. All drainage tiles damaged from construction activities will be repaired and documented, all construction debris would be removed, and landowners would be compensated for lost crops. In addition, upon decommissioning of the project, the land would be restored to its original use.

ORC 4906.20(B)(2) established minimum setbacks for economically significant wind farms. The Board incorporated these minimum setback requirements in OAC 4906-17-08(C)(1)(c), and indicated that such minimum setbacks would be applied to all wind projects under its jurisdiction.

The ORC dictates that the minimum distance from the turbine's base to the property line of the wind farm property must be at least 1.1 times the total height of the turbine as measured from its base to the tip of the blade at its highest point. Assuming a maximum turbine height of 140 meters (459 feet) as proposed in the application, this property line setback equates to a distance of 154 meters (505 feet). The Applicant designed the turbine layout so that all turbine locations comply with these statutory setback requirements.

The ORC further dictates that the minimum distance from a wind turbine to the exterior of the nearest habitable residential structure located on an adjacent property at the time of the application must be no less than 750 feet in horizontal distance from the tip of the turbine's nearest blade at ninety degrees. Using maximum blade lengths of 164 feet as presented in the application, this minimum setback calculates to 914 feet. The Applicant designed the wind farm layout using greater setbacks than the minimums required by rule. As presented in the application, the distance between proposed turbine locations and the nearest habitable residential structures ranges from 1,450 to 4,000 feet, with an average distance of 2,171 feet.

Cultural and Archaeological Resources

The Applicant has identified 27 historic structures, six archaeological sites, and six OGS-listed cemeteries within the project area for the facility. The Applicant asserts that each of the identified sites was considered and all facility components have been sited to avoid them. Additionally, the Applicant determined that the indirect visual impact from the project would not alter or affect the qualities or attributes that contribute to the historical or architectural significance of each identified landmark or NRHP-listed and NRHP-eligible structure. The Applicant has noted that although mitigation options are limited due to the nature of the project, they have considered and incorporated mitigation options to reduce the visual impacts. Examples of such mitigation include screening, uniform turbine design, and turbine color to blend with the sky at the horizon. Additionally, the Applicant continues to work independently with the Ohio Historical Preservation Office to ensure that no additional impacts to archaeological resources will occur.

Aesthetics

The project is expected to have a long-term aesthetic impact on nearby residences. The project would be visible from most, if not all, of the residences in the project area. All of the turbines in the project area are outside of the minimum residential setback of 914 feet and the minimum property line setback of 505 feet, as calculated from the statutory requirements. Screening the turbines from view is not a practical mitigation measure in most cases and visual impacts would be unavoidable. However, mitigation in the form of additional landscaping could be helpful to minimize impacts of the substations and O&M facility.

Economics

There is a direct, indirect, and induced economic benefit to the region during construction and operation of the project, including purchases of construction materials from local vendors and the use of goods and services by facility personnel. The proposed wind farm would generate revenue from construction spending, permanent employment, and local/state taxes. The project would also provide an additional revenue source per wind turbine for participating landowners. This supplementary source of income has the potential to assist the local community through increased spending from the landowners.

Depending on the availability of qualified persons, workers may be from regional labor sources and would include electricians, laborers, engineers, carpenters, cement finishers, iron workers, construction management, and operating staff.

Any project delay could incur unnecessary costs to the wind farm project. There are delay costs due to the high carrying cost of the turbines, lost construction days, and costs associated with idle contractors and equipment. Additionally, there could be penalties incurred for failing to meet production deadlines under a potential Power Purchase Agreement. The Applicant submitted the delay costs associated with this project for Staff review.

Ecological Impacts

Surface Waters

The project is not expected to impact any high-quality surface waters. However, the project could pose some impacts to low-quality surface waters, primarily due to installation of permanent and temporary culverts and underground electric collection cables across existing wetlands, streams, and man-made drainage ditches. Some impacts associated with the installation of culverts and underground electric collection cables include the loss of riparian vegetation, damage to the stream bank and stream bed, erosion, and sedimentation.

The Applicant will consider using horizontal directional drilling (HDD) for installing the underground electric collection system to minimize impacts to wetlands, streams, and ditches. Potential impacts associated with HDD would include disturbances around the bore pits and impacts from potential frac-outs.²⁷ In order to minimize impacts during HDD, the drilling equipment would be set up away from riparian corridors and the drilling activity would be closely monitored for signs of frac-outs. The Applicant has committed to using HDD to install an underground electric collection cable under Flatrock Creek and a high-quality forested floodplain wetland (identified as B-9-B in the "Wetland and Stream Delineation Summary Report" dated August 19, 2010), as an avoidance measure. This location is approximately 750 feet west of County Road 33 along Flatrock Creek. Due to the use of HDD, Staff would require the Applicant to submit a detailed frac-out contingency plan for Staff review and approval.

Culverts and trenching can also have an impact on individual stream beds and substrates. However, the streams and ditches in the project area do not contain high-quality substrate. Instead, the substrate composition is fine sand with trace amounts of gravel or cobble. Therefore, the installation of a culvert or other structure is not expected to cause any permanent impacts to the substrates. However, any amount of disturbance in the streams and ditches would cause some level of turbidity and sedimentation, which can impact downstream surface waters, in this case, unnamed streams, North Creek, South Creek, Blue Creek, Wildcat Creek, Flatrock Creek, the Auglaize River, and the Maumee State Scenic River. The use of best management practices (BMPs) will minimize impacts associated with turbidity and downstream sedimentation.

BMPs utilized in or near water resources would include marking wetlands for avoidance in advance of construction to prevent material storage or vehicle traffic within wetlands, and installing erosion and sedimentation controls around streams and wetlands to prevent

²⁷ *Frac-outs* occur when drilling mud or other lubricants used during the drilling process escape through fractures in the underlying material. The HDD procedure typically uses bentonite slurry, a non-toxic, fine clay material, as a drilling lubricant. Benthic invertebrates, aquatic plants, and fish and their eggs can be smothered by the fine particles if bentonite were discharged to waterways.

disturbance, including sediment runoff, during construction. Additionally, Staff would recommend the use of in-stream work restrictions between April 15 and June 30 during fish spawning periods.

Tree Removal

The proposed project area is largely agricultural, so tree removal would be minimal. Of the approximately 104,739 acres of habitat/vegetation types located within the study areas, forest land acreage represents 2.0 percent. The Applicant's efforts in early stages of project development helped to minimize potential tree clearing associated with the project.

Riparian vegetation would be cleared for the installation of access roads and underground electric collection cables. However, very few of the water resources contain high-quality riparian vegetation, but rather support reeds and cattails that are typical of road side and agricultural drainage ditches. Because the streams and ditches have very narrow riparian areas or lack woody species, the banks are prone to erosion from farm field run-off, which leads to sedimentation. The Applicant would utilize BMPs which would limit the removal of tree stumps and root systems to minimize erosion during construction. After construction, the Applicant would immediately reseed the bank to minimize erosion. Additionally, the Applicant has committed to not constructing any turbines within one-half mile of Flatrock Creek or its associated riparian corridor to protect this high quality natural resource from impacts associated with this project, to the maximum extent practicable.

Wildlife

The project area hosts numerous wildlife species, including commercial and recreational species. The construction and operation of the proposed facility would likely negatively impact some of these species in the form of habitat loss, disturbance (e.g., noise, lighting, human activity), temporary and permanent displacement, and direct mortality due to construction and operation activities.

The Applicant conducted avian and bat pre-construction surveys in coordination with the DOW and the USFWS. Based on the survey results, it is unlikely that this project would appreciably impact avian species in the project area. To further minimize potential avian impacts, the Applicant intends to minimize lighting at its proposed substation and O&M building as a means of reducing potential attractants to migratory birds during certain weather conditions. The 2009 bat acoustic monitoring conducted by the Applicant did indicate bat activity in the area. The results of the acoustic work conducted by the Applicant revealed that approximately 82 percent of the bat calls were "low frequency" (less than 30 kilohertz), which was attributed to such species as big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), and silver-haired bat (*Lasionycteris noctivagans*). According to the Applicant, these three bat species are all known to have experienced casualties at other wind turbine locations. Higher frequency calls (greater than 40 kilohertz) that would indicate presence of *Myotis* species comprised approximately 7 percent of all calls. Given the bat activity in the area, it is likely that some level of direct mortality of common bat species would occur during the project's operation. With regard to the Indiana bat (*Myotis sodalis*), the Applicant's avoidance of habitat typically identified as suitable for summer roosting by Indiana bats, such as wooded areas, reduces the likelihood of the project impacting this species. However, the project may have some potential to negatively impact Indiana bats if present within the project area during migration.

The project is within the range of the purple lilliput (*Toxolasma lividus*), pondhorn (*Uniomerus tetralasmus*), and deertoe (*Truncilla truncate*) mussel species. If listed or common mussel species are present within the project area, they could be negatively impacted due to stream disturbances associated with the construction of the underground electric collection system and both temporary and permanent access roads. Minimizing potential impacts to mussels, if present, could be achieved through a combination of certain stream crossing methodologies or the relocation of project components and/or the mussels. The DOW and OPSB Staff would require that the Applicant perform a presence/absence survey for all stream segments that have a potential to be impacted by construction activities associated with this project. This survey would indicate if particular avoidance, minimization, or mitigation strategies are warranted to protect mussels.

Impacts to other wildlife species would be minimized largely by the Applicant's efforts to locate the overall project footprint so as to avoid many of the more environmentally-sensitive areas, including wooded areas, streams, and wetlands.

Public and Private Water Supplies

The Applicant does not anticipate significant adverse impacts to public or private water supplies due to construction of the Timber Road II Wind Farm. The Applicant should conduct spill response training to construction and O&M staff as needed to limit potential for impact. The Applicant should also use prudent design including, but not limited to, the use of containment structures for oil and chemicals used during construction, operation, and/or maintenance. Staff also recommends compliance with any drinking water source protection plans developed by villages within the project boundaries. Compliance with these control mechanisms minimizes the potential impact to public and private water supplies.

Geology

The geology of the project area consists of glacial till ranging from 15 to 50 feet thick. The glacial till consists of a heterogeneous mixture of all sizes of soil consisting of clay, silt, sand, and gravel. It may also contain streaks, seams, layers, or lenses of sand and gravel, which may be water-bearing. The bedrock within the project area is the Salina Group, comprised of brown limestones and dolomites and is somewhat variable in character. There are no known or probable karst areas within the project area.

The highest elevation in Paulding County is about 775 feet above sea level (ASL) and is located along U.S. Route 30 in the extreme southwestern part of the county. The lowest elevation is about 685 feet ASL and is at the point where the Maumee River flows into Defiance County in the north central part of the county. The total relief across the county is 90 feet.

Paulding County does not have any recorded earthquake activity or earthquake epicenters of note. The closest known structural feature is the Fort Wayne Rift, located 15 miles southwest of the project area. Seismic activity has been recorded in north central Mercer County, approximately 28 miles southeast of the project area. The epicenter of the highest magnitude earthquake (5.4) recorded in Ohio to date occurred in 1937 near Anna, approximately 50 miles southeast of the project area. Earthquakes do not pose a threat to the structural stability in the project area.

Based on the consultant's experience with earthwork in the region, conventional shallow foundations may be able to support the turbines. However, this assumption will need to be

confirmed by a detailed geotechnical exploration and evaluation at each turbine site. The geotechnical engineer will examine foundation designs and compatibility with the supporting soils and approve the work prior to placement of the foundation components. Based on the anticipated depth of the bedrock in the project area, bedrock blasting is not anticipated. The geotechnical exploration and evaluation, along with test borings, will be conducted prior to construction. Sub grade soils are subject to shrinking and swelling due to variation in seasonal moisture contents. Consideration must be given during constructability reviews to determine how to best deal with potential moisture fluctuations.

Public Safety

The project is not expected to have long-term growth impacts on Paulding County or surrounding areas. As a result, there would be no significant impacts to public services and facilities from the general operation of the facility. The Applicant states that existing nearby roads should be adequate to handle the increase in the amount of traffic during construction. Existing traffic may experience minor delays as escort vehicles, flag persons, and temporary traffic signals may stop or slow traffic to allow safe passage of the transport vehicles. The project is not expected to create any temporary road or lane closures as a result of construction. No other significant adverse impacts on local services are expected.

Because local emergency responders would likely be unfamiliar with addressing emergencies related to wind turbines, the Applicant will coordinate and develop a fire protection and medical emergency response plan in consultation with the fire department that has jurisdiction over the project area.

The electric collection system for the wind farm will be buried underground at a minimum depth of four feet. By law, anyone with underground facilities must be a member of a one-call system such as the Ohio Utilities Protection Service (OUPS). The OUPS establishes a communication link between the wind farm owner and individuals planning any digging activity. The owner of the buried facilities is required to mark underground lines before any digging or excavation work begins.

Roads and Bridges

The Applicant's preferred equipment and material delivery route is to access the project area from the south on State Route 49 and from the north on County Highway 21. However, the components could come from various sources and directions which would necessitate improvements to alternative access roads. Roadways outside of the study area will be evaluated by the company delivering the turbine components prior to construction, as part of the Special Hauling Permit process required by the Ohio Department of Transportation.

The roadways within the study area appear to be in good condition and adequate to accommodate construction activities. A minimum width of 16 feet would be required to accommodate construction traffic. County Road 11, Township Road 5, and portions of township roads 60 and 94 would need to be widened to a minimum of 16 feet to accommodate construction traffic. All other roadways in the study area proposed for use by construction vehicles are 16 feet in width or wider. The bridges in the area are generally narrower than the roadways and over-width vehicles would likely need to cross the center line to traverse the bridges.

The paved and stone/gravel surface condition appear adequate to accommodate construction activities. The Applicant has performed some bores of the roads along the delivery route to determine if these roads could handle the additional weight of the turbine components. Any improvements necessary for the roads must be made prior to delivery of the turbine components. In addition, these roads should be monitored during construction for pot-holing and deterioration of the pavement to ensure they are safe for general construction and local roadway traffic. Grass roadways would not be adequate for construction traffic and would need to be replaced with gravel roadways. Post construction, in consultation with the county engineer, new gravel roads may be left in place as an upgrade to better accommodate local traffic.

All intersections in the area would need improvements to accommodate the oversized/overweight vehicles for turbine delivery from the manufacturer. These trucks require minimum clearances due to their size and turning radii. There does not appear to be any significant construction challenges such as steep grades, existing structures, or significant clearing with the proposed improvements. Improvements and associated impacts would need to be reevaluated during the final engineering process to determine the best solution for each intersection. Clearing of vegetation, relocating traffic signs, grading of the terrain, extension and/or reinforcement of existing drainage pipes and/or culverts, re-establishment of a ditch line if necessary, and construction of a suitable roadway surface to carry construction traffic must be addressed for each public roadway.

The vertical profile of the roadways within the project should be adequate with the exception of intersections and directly over Route 49. These areas would need to be reviewed during final design to determine if improvements or modifications would be required.

Any location along the delivery route with a vertical clearance less than 16 feet would need to be adjusted. The Applicant must coordinate and obtain permits from utility companies in order to adjust utility lines crossing the roadways.

The Applicant identified nine bridges that could be part of the delivery route. No study was done on these bridges other than to determine if they could accommodate legal loads. Once the final design of the project is complete and the manufacturer and hauling company has been selected, the Applicant, in coordination with the county engineer, would reevaluate these bridges with the actual axle configuration and loads to determine if improvements are necessary.

Post-construction and operational impacts to roads and bridges should be limited, as the roads would be able to handle any operational or maintenance requirements that the Applicant may need to perform on the wind turbine generator components.

Construction Noise

Noise impacts from construction activities would include the operation of various trucks and heavy equipment. The Applicant provided estimates of sound levels associated with operation of this construction equipment. Although the Applicant intends to use BMPs for noise abatement during construction, many of the construction activities would generate significant noise levels. However, Staff believes that the adverse impact of construction noise would be minimal because it is temporary and intermittent, it would occur away from most residential structures, and most construction activities would be limited to normal daytime working hours.

Operational Noise

The Applicant retained Tetra Tech EC, Inc. to conduct noise studies of potential impacts from operation of the facility. Tetra Tech utilized DataKustic GmbH's Cadna/A[®] computer noise modeling software to perform acoustic modeling. Cadna/A[®] computes calculations using international standard ISO 9613-2 for industrial sources. Tetra Tech analyzed the 1/1 and 1/3 octave bands with frequencies ranging from 6.3 hertz (Hz) to 20 kilohertz to develop the wind turbine sound estimates. The acoustic survey states that operational sound output for the project would be between 25 to 47 dBA at residences within the project area. Tetra Tech additionally modeled the cumulative impacts of the Timber Road II project and adjacent proposed wind projects. This cumulative study provided the same range, 25 to 47 dBA, for expected sound levels at residences within the Timber Road II project area.

Some atmospheric conditions can also further propagate or amplify sound. Two examples are wind shear and temperature inversions. Wind shear occurs when the winds aloft near the top of the wind turbine are moving faster or in a different direction than the wind near the ground. Wind turbulence, or wakes from adjacent turbines, can also create wind shear. This shear can result in aerodynamic modulation, a rhythmic noise pattern, or pulsing, which occurs as each blade passes through areas of different wind speed/direction.

A temperature inversion occurs most often when the ground cools off quickly, while the air above the ground remains warm. As the temperature increases with height, the speed of sound also increases. This means that for a sound wave traveling close to the ground, the part of the wave closest to the ground is traveling the slowest, and the part of the wave farthest above the ground is traveling the fastest. As a result, the wave changes direction and bends downwards. This downward refraction of sound helps to further propagate otherwise attenuated sound.

The noise impact of the wind farm also depends on the existing ambient noise level of the project area. The Applicant conducted an acoustic survey for both the Timber Road II Wind Farm and a future adjacent wind project between April 28 and May 12, 2010. Six survey locations, three points per project, were acoustically sampled. Recorded ambient noise levels (L_{EQ}) across the three points within the Timber Road II project area ranged from 35 to 53 dBA and the L_{90} ranged from 26 to 46 dBA. The survey results equate to a project area nighttime L_{EQ} of 41 dBA.

A 2001 New York State Department of Environmental Conservation (NYSDEC) document states that "in non-industrial settings the [noise level] should probably not exceed ambient noise by more than 6 dBA at the receptor. An increase of 6 dBA may cause complaints. There may be occasions where an increase in [noise levels] of greater than 6 dBA might be acceptable."²⁸ The NYSDEC recommends that, while it may be acceptable in some non-industrial settings, an increase in ambient noise levels of greater than 6 dBA warrants further study of potential impacts.

Shadow Flicker

The Applicant used WindPRO to calculate how often and in which intervals a specific receptor could be affected by shadows generated by one or more wind turbines. The calculation of the potential shadow impact at a given shadow receptor, defined as a one-meter square area located one meter above ground level, is carried out by simulating the environment near the wind

²⁸ NYSDEC. (February 2, 2001). *Assessing and Mitigating Noise Impacts* (p. 14). Albany, New York. Retrieved from the NYSDEC Web site: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/noise2000.pdf

turbines and shadow receptors. The position of the sun relative to the turbine rotor disk and the resulting shadow is calculated in time steps of one minute throughout a complete year. If the shadow of the rotor disk, which in the calculation is assumed solid, at any time casts a shadow on a receptor, then this step will be registered as one minute of potential shadow impact. These calculations took into account the wind turbine location, elevation, and dimensions, and the receptor location and elevation.

A wind turbine's total height and rotor diameter were included in the WindPRO shadow flicker models. The higher the turbine, the more likely shadow flicker could have an effect on the local receptors, as the longer shadow has greater potential to reach beyond obstacles such as trees or hills. The larger the rotor diameter, the more area on the ground could be affected by shadow flicker. Dimensions for the wind turbine models proposed for the Timber Road II Wind Farm, and used for this study, are shown below.

Turbine Model	Capacity (MW)	Hub Height (m)	Rotor Diameter (m)	Blade Tip Height (m)
Vestas V100	1.8	80	100	130
Vestas V90	1.8	80	90	125
Vestas V90	1.8	95	90	140
General Electric XLE	1.6	80	82.5	121
Acciona AW82	1.5	80	82	121

Reductions based on the turbines' operational time, operational direction, and sunshine probabilities were then used to calculate a realistic amount of shadow flicker to be expected at each shadow receptor. The Applicant simulated shadow flicker from the proposed turbines out to one kilometer (3,280 feet). Shadow flicker beyond one kilometer from a turbine in northern latitudes such as Ohio can occur seasonally at sunrise and sunset when lower sun elevation angles occur. No state or national standards exist for frequency or duration of shadow flicker from wind turbine projects. However, international studies and guidelines from Germany and Australia have suggested 30 hours of shadow flicker per year as the threshold of significant impact, or the point at which shadow flicker is commonly perceived as an annoyance. This 30-hour standard is used in at least four other states, including Michigan, New York, Minnesota, and New Hampshire. Accordingly, the Applicant and Staff utilized a threshold of 30 hours of shadow flicker per year for their analyses.

Additional screening factors were considered for receptors expected to receive greater than 30 hours of shadow flicker exposure. Depending on the selected turbine model, up to eight receptors have been modeled to exceed 30 hours of flicker per year. Seven of the eight identified receptors are project participants, with the remaining one uninhabited and a non-participant.

Shadow flicker frequency is related to the wind turbine's rotor blade speed and the number of blades on the rotor. Shadow flicker at certain frequencies may potentially affect persons with epilepsy. For about three percent of epileptics, exposure to flashing lights at certain intensities or to certain visual patterns may trigger seizures. This condition is known as photosensitive epilepsy. The frequency or speed of flashing light that is most likely to cause seizures varies from person to person. Flashing lights most likely to trigger seizures are between the frequency of 5 to 30 flashes per second or Hz.²⁹ This project's maximum wind turbine rotor speed

²⁹ Epilepsy Foundation of America. Retrieved Dec. 21, 2009, from Epilepsy Foundation Web site: <http://www.epilepsyfoundation.org/about/photosensitivity/>

translates to a blade pass frequency of approximately 0.31 Hz and therefore would not be likely to trigger seizures.

Communication Interference

The television reception analysis identified all off-air television stations within a 100-mile radius of the approximate center point of the proposed facility. Off-air television stations transmit broadcast signals from terrestrial facilities. The signals can be received directly by a television receiver or house-mounted antenna. The Applicant states that the television stations most likely to produce off-air coverage to Paulding County are those at a distance of 40 miles or less.

Of the 63 stations identified within 40 miles of the project area, 14 are fully-operational stations which provide television programming to the area. Channels in nearby communities may suffer degradation of off-air television signal reception if the wind turbines are installed. This degradation would be the result of television signal attenuation or reflection caused by one or more of the wind turbines. This affect is due to the relative location of the off-air television broadcast antenna, the wind turbines, and the point of reception.

Some communities may not be affected at all, while others may have multiple channels affected. The Applicant states that based on the location of the proposed project area and the TV stations servicing the area, it does not appear that there would be many communities where degradation of TV coverage would occur. The Applicant's contractor, Comsearch, has listed two possible mitigation options if an area does suffer from degradation of TV coverage. The Applicant could offer television hookups, where a cable system is available, or direct broadcast satellite TV reception systems.

Within a 25-mile radius as measured from the approximate center of the project area, there are 15 database records representing eight AM stations licensed to operate at two transmit power levels. Due to the distance between the stations and the project area, no degradation of AM broadcast coverage is anticipated.

The Applicant states that FM station coverage is not subject to degradation when they are at distances greater than 2.5 miles from wind turbines. All of the stations are located outside of the project area, with the closest station being 8.1 miles from the center of the project and well beyond 2.5 miles from the nearest turbine.

Microwave telecommunication systems are wireless point-to-point links that communicate between two antennas and require clear line-of-sight conditions between each antenna. Comsearch identified potential microwave interference from turbines 15, 17, and 76. The Applicant has proposed that the location for these turbines be shifted slightly to avoid interference.

Signal blockage caused by the wind turbines would not degrade the wireless telephone network because of the way these systems are designed to operate. If the signal cannot reach one cell, the network design allows it to be able to reach one or more other cells in the system. As such, local obstacles are not normally an issue for wireless telephone systems.

Local and Long Range Radar Interference

Wind turbines can interfere with civilian and military radar in some scenarios. The potential interference occurs when wind turbines reflect radar waves and cause ghosting (false returns) or shadowing (dead zones) on receiving monitors. Radar interference thus raises national security

and safety concerns. In the majority of cases, the U.S. Department of Defense finds that the interference is either not present, is not deemed significant, or can be readily mitigated. Potential interference is highly site-specific and depends on local features, the type of radar, and wind farm characteristics. In some cases, radar interference can be corrected with software that deletes radar signals from stationary targets. The potential for radar interference has not been identified through government agency review. The Applicant must submit all turbine locations and heights to the National Telecommunications and Information Administration (NTIA) for review and guidance regarding potential radar interference.

In summary, a potential exists for a reduction of television reception, radar line-of-sight, and microwave transmission interference. The Applicant has proposed mitigation measures for all known potential impacts, but has yet to submit for NTIA review.

Ice Throw

The Applicant indicates that all turbines would have the following safety features to address ice throw: two independent braking systems, ice detection software, automatic turbine shut down at excessive vibration, and automatic turbine shut down at excessive wind speeds. The nearest residence is approximately 1,400 feet from a turbine, and the Applicant applied a property setback of 505 feet.

An independent study performed by Seifert et al.³⁰ and supported by the German Wind Energy Institute has suggested safety standards for ice throw and blade shear and has recommended the use of an ice detector and other measures if people or objects (e.g., occupied structures, roads) are within a distance of 150 percent of the sum of the hub height and rotor diameter. . Based on inputs into a formula used in this study, it has been determined that turbines of the similar dimensions as those proposed by the Applicant would need to be located a distance of approximately 277.5 meters (910 feet) from any structure or roads. Staff recommends that public access be restricted with appropriately placed warning signs, that the Applicant would instruct workers of potential hazards of ice conditions, and that the Applicant would install ice detection software for the site and an ice detector/sensor alarm that triggers an automatic shutdown. Adhering to these safety measures would sufficiently address the issue of ice throw.

Blade Shear

The Applicant asserts that past incidences of blade shear have generally been the results of human error. Staff has also found that past incidences can be attributed to design defects during manufacturing, poor maintenance, control system malfunction, or lightning strikes. The GE 1.6 xle, Acciona AW82, Vestas V90, and Vestas V100 are certified to international engineering standards. The turbines have the following safety features to address blade shear: two independent braking systems, a pitch control system, a lightning protection system, and turbine shut down at excessive wind speeds and at excess blade vibration or stress. The nearest residence is approximately 1,400 feet from a turbine, and the Applicant applied a property setback of 505 feet. Installing and utilizing these safety control mechanisms minimizes the potential for blade shear and associated impacts.

³⁰ Seifert, Westerhellweg, and Kroning. (2003). *Risk analysis of ice throw from wind turbines*. DEWI.

High Winds

The GE 1.6 xle and Vestas V90 turbines have a cut-out speed of 25 meters per second (m/s), or 56 miles per hour (mph). The Acciona AW82 and Vestas V100 turbines have a cut-out speed of 20 m/s, or 45 mph. The GE 1.6 xle and Vestas V90 turbines are certified by the International Electrotechnical Commission (IEC) as Class II wind turbines, and have been designed to withstand wind speeds of 42.5 m/s or 95 mph. The Vestas V100 wind turbine has been certified by the IEC as a Class S wind turbine, and has been designed to withstand 42.5 m/s or 95 mph wind speeds. The Acciona AW82 wind turbine has been certified by the IEC as Class IIIB wind turbines and has been designed to withstand wind speeds of 37.5 m/s or 84 mph.

The Applicant states that the turbines have the following safety features in case of high winds: two independent braking systems and automatic turbine shut down at excessive wind speeds. The nearest residence is approximately 1,400 feet from a turbine, and the Applicant applied a property setback of 505 feet. Installing and utilizing these safety control mechanisms minimizes the potential impacts from high winds.

Decommissioning

Megawatt-scale wind turbine generators typically have a life expectancy of 20-25 years. The current trend has been to upgrade older turbines with more efficient ones while retaining existing tower structures. If not upgraded, turbines go into a period of non-operation, where no expectation of re-operation exists, and are generally decommissioned at such time.

Upon decommissioning, the site must be restored and reclaimed to the same general topography that existed prior to the beginning of the construction of the commercial facility, with topsoil re-spread over the disturbed areas at a depth similar to that in existence prior to the disturbance. Areas disturbed by the construction of the facility and decommissioning activities must be graded, top soiled, and re-seeded according to Natural Resource Conservation Service technical guide recommendations and other agency recommendations.

The Applicant has proposed the posting of a bond or equivalent financial security in the amount of \$25,000 per turbine after 10 years of operation to ensure that funds are available to complete decommissioning. The Applicant further proposes that if the decommissioning costs were to exceed the bonded amount, the salvage or resale value of the wind facilities would be used to complete decommissioning.

Conclusion

Staff concludes that the project, as proposed, would result in both temporary and permanent impacts to the project area and surrounding areas. Staff has recommended several conditions in order to address and minimize these impacts. With the recommended conditions, Staff concludes that minimum adverse environmental impacts would be realized.

Recommended Findings

The Staff recommends that the Board find that the proposed facility represents the minimum adverse environmental impact, and therefore complies with the requirements specified in ORC Section 4906.10(A)(3), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(4)

ELECTRIC GRID

Pursuant to ORC Section 4906.10(A)(4), the Board must determine that the proposed electric generation facility is consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, and that the facility will serve the interests of electric system economy and reliability.

The purpose of this section is to evaluate the impact of interconnecting the proposed 150 MW Timber Road II Wind Farm into the existing regional electric transmission system. The proposed wind farm would be located in the AEP zone of the PJM Interconnection (PJM) control area. The Applicant plans to use an underground 34.5 kV collection system to gather the energy into a single project substation owned by the Applicant. The energy from the Applicant's substation would be injected into the local and regional grid via a new, AEP-owned, 138 kV interconnection switching station connected to the AEP's Haviland-Milan 138 kV transmission line.

PJM Interconnection Analysis

PJM, a regional transmission organization, is charged with managing the regional transmission system and the wholesale electricity market. In addition, PJM administers the interconnection process of new generation to the system. Generators wanting to interconnect to the bulk electric transmission system located in the PJM control area are required to submit an interconnection application for review of system impacts. Paulding Wind Farm II submitted the proposed project to PJM on December 6, 2006. PJM gave the application a queue number of R49.

The Applicant proposes to construct one new collection substation and one 138 kV switching station that would interconnect the Timber Road II Wind Farm to AEP's Haviland-Milan 138 kV transmission line. The Haviland-Milan 138 kV line is part of the regional bulk electric transmission system operated by PJM. The Applicant's collection substation would collect energy from the individual wind turbines and step the voltage up from 34.5 kV to 138 kV. The AEP interconnection switching station would take the stepped up voltage from the project substation and inject it into the local and regional transmission grid via the AEP Haviland-Milan 138 kV transmission line.

PJM has completed the Feasibility Study and System Impact Study for the proposed wind farm project, which includes local and regional transmission system impacts and stability and short circuit analysis. These studies summarized the impacts of adding the proposed facility to the regional bulk power system and identified any transmission system upgrades caused by the project that would be required to maintain the reliability of the regional transmission system. Paulding Wind Farm II has not yet signed a Construction Service Agreement for the upgrades identified in the studies or an Interconnection Service Agreement with PJM for the proposed facility. Signature on the Interconnection Service Agreement will need to be obtained before PJM will allow the Applicant to interconnect the proposed facility to the bulk electric transmission system.

Staff reviewed the System Impact Study report prepared by PJM. The study was evaluated for compliance with reliability criteria for PJM summer peak load conditions for 2012. The 150 MW project was analyzed as an energy resource. An energy resource means deliverability analysis is

not required, the energy resource is only permitted to participate in the energy market, and it may not be used by a load-serving entity to meet capacity obligations. Twenty percent or 30 MW was studied as a capacity resource. For capacity resource analysis, PJM assumes that 13 percent of a wind farm output would be available during peak conditions. However, larger requests may be accepted. A capacity resource may be utilized by a generator by PJM Load Serving Entities to meet capacity obligations.

North American Electric Reliability Corporation Standard Requirements

The North American Electric Reliability Corporation (NERC) is responsible for the development and enforcement of the federal government's approved reliability standards, which are applicable to all owners, operators, and users of the bulk power system. NERC requires planners of the bulk electric transmission system to meet Reliability Standards³¹ TPL-001-0.1 through TPL-004-0 under transmission outage conditions for categories A, B, C, and D contingencies. According to NERC, a contingency is an unexpected failure or outage of a system component, such as a generator, transmission line, circuit breaker, switch, or other electrical element.

Under category A (no contingencies, normal system conditions) and category B (single contingency outage), the planning authority and transmission planner shall demonstrate that the interconnected transmission system can operate to supply projected customer demands and firm transmission service at all demand levels over the range of forecast system demand. Under category C (multiple contingency outages), the planning authority shall demonstrate that the interconnected transmission system can operate to supply projected customer demands and firm transmission service at all demand levels over the range of forecast system demand and may rely upon the controlled interruption of customers or curtailment of firm transmission service. Finally, under category D (extreme events resulting in multiple contingencies), the planning authority shall demonstrate that its portion of the interconnected transmission system is evaluated for the risks and consequences of a number of each of the extreme contingencies that are listed in the standard. PJM analyzed the bulk electric system for all of the above categories with the proposed new facility interconnected to the bulk power system.

A 2012 summer peak power flow model was used to evaluate the regional reliability impacts, a 2013 summer peak power flow was used to evaluate the regional stability and reactive power requirements, and a 2009 summer model was used to evaluate local AEP reliability impacts. The local study exhibited a stability issue and impact on local system during a single contingency. The regional studies revealed no problems. The results of the PJM System Impact Study for the local AEP system and the regional PJM footprint are as follows:

³¹ North American Electric Reliability Corporation. (Sep. 2009). *Reliability standards for the bulk electric systems of North America*. TPL-001-0.1-TPL-004-0, 953-984.

Generator Deliverability

Category A & Category B: No Contingencies and Single Contingencies

- Studied for the capacity portion (30 MW)
- PJM Region: No problems identified
- AEP System: Problem identified under single contingency condition. Outage of the Haviland-R49 Ohio West 138 kV circuit overloads the Tillman 138/34.5 kV transformer to 101 percent of its summer rating. This overload will be alleviated by replacing the existing transformer with a 30 MVA unit that will require installation of a high-side circuit switcher and associated equipment.

Multiple Contingencies

Category C and Category D

- Studied for the full energy output (150 MW)
- PJM Region: No problems identified
- AEP System: No study required under AEP planning criteria

Short Circuit Analysis

The short circuit analysis study evaluates the interrupting capabilities of circuit breakers located at the proposed plant site and other circuit breakers impacted by the proposed generation addition. No problems were identified on the AEP system or in the PJM region.

Stability and Reactive Power Requirement

This study evaluates the stability and low voltage ride-through criteria (LVRT) capability. The stability analysis evaluates the ability of the power system to withstand disturbances or contingencies and maintain stable operation of the bulk electric grid. The LVRT tests the ability of the wind farm generator to maintain operation and interconnection with the system during events that cause extremely low voltage transients as measured at the high side of the transformer that steps up the wind farm's voltage to the transmission system (high side of the wind farm generator step-up transformer).

- PJM Region: No stability problems were identified with the new transmission line upgrade.
- AEP System: Instability occurs for the double contingency of Robison Park-R49 and East Lima-Haviland 138 kV lines. Generation curtailment will be required following the first contingency of either Robison Park-R49 line or East Lima-Haviland 138 kV line.

Previously Identified Overloads

The PJM study for this project was evaluated for its contribution to other previously identified overloads recognized for earlier generation and transmission interconnection projects in the PJM Queue. No previously identified overloads were found.

Previously Identified System Reinforcements

PJM studied overloads initially caused by prior Queue positions with additional contribution to overloading by this project. Proposed projects could be allocated a portion of the cost to alleviate overloading found in the "Previously Identified Overloads" section. Timber Road II Wind Farm would not be allocated any cost responsibility.

New System Reinforcements

PJM did not find any upgrades required to mitigate criteria violations, such as network impacts, initially caused by the addition of this project's generation.

Reactive Requirements

New wind-powered generation must maintain a power factor of 0.95 leading to 0.95 lagging, measured at the point of interconnection. The Applicant would be required to maintain this requirement.

Upgrade Costs

The Applicant would be responsible for the direct connection costs and the local upgrade cost to alleviate the overload on the Tillman 138/34.5 transformer. The preliminary direct connection cost is \$6.3 million for the construction of a new switching station and line relaying. The preliminary local upgrade cost is \$1.9 million for replacement of a transformer and associated equipment.

Conclusion

The Applicant provided PJM's generation interconnection analysis to Staff for review of the impacts of connecting the Timber Road II Wind Farm to the regional transmission grid. These studies were performed by PJM and comply with NERC standards for adding new facilities. The studies indicated no problems on the PJM regional system. The local system study indicated problems that will be alleviated by replacing the Tillman 138/34.5 transformer and associated equipment. In addition, the local stability analysis revealed that generation would need to be curtailed following the first contingency of Robison Park-R49 or East Lima-Haviland 138 kV. The Applicant would be responsible for all the costs associated with the required local upgrade and construction and associated equipment related to the proposed AEP interconnection switching station. The proposed facility is consistent with plans for expansion of the regional power system, and serves the interests of electric system economy and reliability. The facility would serve the public interest, convenience, and necessity by providing new wind generation to the regional transmission grid. In addition, Ohio Senate Bill Number 221 requires electric distribution utilities to provide alternative energy resources. Staff believes this facility may help meet this requirement.

Recommended Findings

The Staff recommends that the Board find that the proposed facility is consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, and that the facility would serve the interests of electric system economy and reliability. Therefore, the facility complies with the requirements specified in ORC Section 4906.10(A)(4), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(5)

AIR, WATER, SOLID WASTE, AND AVIATION

Pursuant to ORC Section 4906.10(A)(5), the facility must comply with specific sections of the ORC regarding air and water pollution control, withdrawal of waters of the state, solid and hazardous wastes, and air navigation.

Air

The Applicant has provided ambient air quality data for the proposed project area. There are no air monitoring stations in Paulding, Defiance, Putnam, or Van Wert counties. Air monitoring stations in nearby counties in Ohio monitor for the following pollutants: particulate matter, ozone, and sulfur dioxide in Allen County; lead in Fulton County; particulate matter in Hancock County; and ozone in Wood County. An air monitoring station in Allen County, Indiana, monitors ozone and particulate matter. National Ambient Air Quality Standards (NAAQS) were exceeded for ozone and particulate matter in Allen County, Indiana. The Ohio EPA lists Paulding County as in attainment or unclassified with the National Ambient Air Quality Standards (NAAQS).

The operation of the wind turbine facility would not produce air pollution, therefore there are no applicable air quality limitations, NAAQS, prevention of significant deterioration increments, or the need for permits to install and operate an air pollution source. A Permit-to-Install (PTI) or Permit-to-Install and Operate (PTIO) may be required for access roads or for a concrete batch plant. The Applicant may also need to obtain the Ohio EPA *General Permit for a Central Mix Ready Mix Concrete Batch Plant* (General Permit 4.2) and the Ohio EPA *General Permit for Unpaved Roadways and Parking Areas, with a maximum of 120,000 Vehicle Miles Traveled per Year* (General Permit 5.1).

The Applicant plans to minimize emissions during site clearing and construction by using BMPs such as maintaining construction equipment in good working condition, as well as controlling dust by minimizing the extent of exposed/disturbed areas and using water or a county approved dust suppressant.

Staff believes that construction and operation of the facility, as described by the Applicant and in accordance with the conditions included in this staff report, would be in compliance with air emission regulations in ORC Chapter 3704, and the rules and laws adopted under this chapter.

Water

Neither construction nor operation of the proposed facility would require the use of significant amounts of water, so requirements under ORC 1501.33 and 1501.34 are not applicable to this project.³² The Applicant has indicated that it will apply for the following permits:

- USACE 404 Nationwide Permit #12 as determined by the USACE
- Ohio EPA 401 Water Quality Certification (if necessary)

³² Preparation of concrete for the wind turbine foundations would consume up to approximately 20,000 gallons of water per foundation. Although this is a large amount of water, it is not significant in the context of ORC 1501.33, which involves the use of more than two million gallons per day over a 30-day period.

- Ohio EPA National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharge from Small and Large Construction Activities
- Onsite Sewage Treatment System (OSTS) permit (if necessary)

In order to obtain the NPDES, an Ohio EPA Notice of Intent (NOI) application will be submitted 21 days before construction. Included with the NOI is the Storm Water Pollution Prevention Plan (SWPPP).

If a temporary batch plant is necessary, the wastewater would be minimal and be handled via reuse in the concrete production process, stored in an on-site holding tank for disposal at a publicly owned treatment works, or discharged to a local surface waterway under an Ohio EPA NPDES approved discharge permit.

Approximately 191.3 acres of impervious surface would be generated as a result of the facility, including turbine foundations, access roads, substations, and an O&M building footprint. The facility would not significantly alter flow patterns or erosion and, given the small increase in impervious surface within the facility, no modifications in the direction, quality, or flow patterns of storm water run-off are anticipated.

The Applicant would mitigate effects to changes in the quality and quantity of aquatic discharges by the following means:

- Obtain a NPDES General Storm Water Discharge permit from the Ohio EPA;
- Prepare a SWPPP that identifies potential sources of pollution and describes and ensures the implementation of BMPs;
- Prepare a Spill Prevention, Containment, and Countermeasure plan (SPCC) that will outline procedures to be implemented to prevent the release of hazardous substances into the environment;
- Conduct topsoil removal and de-compaction, which would minimize the impact from soil compaction that could possibly reduce water infiltration through the soil.

Staff believes that construction and operation of this facility would comply with requirements of ORC Chapter 6111, and the rules and laws adopted under this chapter.

Solid Waste

The Applicant has indicated that it is not aware of pre-construction solid waste in the project area. Waste generated during construction would be approximately 7,000 tons and would consist of packing materials (plastic, wood, and metal packing), construction scrap, and general refuse. Solid waste generated during operation would be the type and amount comparable to a small business office. The solid waste would be disposed of in dumpsters and taken to a licensed solid waste disposal facility. Staff believes that the Applicant's solid waste disposal plans would comply with solid waste disposal requirements in ORC Chapter 3734, and the rules and laws adopted under this chapter.

Aviation

One commercial service-primary and four general aviation airports exist within 20 miles of the proposed facility:

- Fort Wayne International Airport (FAA Identifier KFWA) is a commercial service-primary airport located 20 miles west of the proposed facility. This airport is publicly owned, public use and maintains three active runways. Runway 09/27 has an asphalt/concrete surface and is 4,001 feet in length by 75 feet wide. Runway 14/32 has an asphalt/concrete surface and is 8,001 feet in length by 150 feet wide. Runway 05/23 has an asphalt/concrete surface and is 11,981 feet in length by 150 feet wide.
- Paulding Airport (FAA Identifier 2H8) is a general aviation airport located 10 miles northeast of the proposed facility. This airport is a privately owned, public use airport that maintains one active runway. Runway 18/36 has a turf surface and is 2,861 feet in length by 80 feet wide.
- Defiance County Regional / Defiance Memorial Airport (FAA Identifier KDFI) is a general aviation airport located 18 miles northeast of the proposed facility. This airport is a publicly owned, public use airport that maintains one active runway. Runway 12/30 has an asphalt surface and is 4,197 feet in length by 72 feet wide.
- DeKalb County Airport (FAA Identifier KGWB) is a general aviation airport located 17 miles northwest of the proposed facility in Indiana. This airport is a publicly owned, public use airport that maintains one active runway. Runway 09/27 has an asphalt surface and is 5,000 feet in length by 100 feet wide.
- Smith Field Airport (FAA Identifier KSMD) is a general aviation airport located 18 miles northwest of the proposed facility. This airport is a publicly owned, public use airport that maintains two active runways. Runway 05/23 has an asphalt/concrete surface and is 3,124 feet in length by 100 feet wide. Runway 13/31 has an asphalt/concrete surface and is 2,922 feet in length by 100 feet wide.

In accordance with Federal Aviation Administration (FAA) Advisory Circular 70/7460.2k, "Proposed Construction or Alteration of Objects That May Affect the Navigable Airspace", the Applicant is required to file FAA Form 7460-1, "Notice of Proposed Construction or Alteration", for all turbine locations. Any structure that the FAA deems to be an impact to air travel and/or would have an adverse physical or electromagnetic interference effect upon navigable airspace or air navigation facilities will receive a *presumed hazard* designation. As of the date of preparation of this report, all turbine locations have been submitted for FAA review and have received determinations of *no hazard* to aviation. The Applicant also filed with the ODOT Office of Aviation for review but received notice that a permit is not required from its office in this case.

In accordance with ORC Section 4561.32, Staff contacted the ODOT Office of Aviation during review of this application in order to coordinate review of potential impacts the facility might have on local airports. When creating the recommended conditions for the certificate, Staff implemented FAA and/or ODOT Office of Aviation recommendations where deemed justified through conversation and exchange with subject matter experts.

Recommended Findings

The Staff finds that the proposed facility complies with the requirements specified in ORC Section 4906.10(A)(5), provided that any certificate issued by the Board for the certification of the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(6)

PUBLIC INTEREST, CONVENIENCE, AND NECESSITY

Pursuant to ORC Section 4906.10(A)(6), the Board must determine that the facility will serve the public interest, convenience, and necessity.

Public Interaction

A copy of the application was filed with the Board and was served upon the Harrison and Benton township trustees, the Paulding County commissioners, the Director of Paulding County Economic Development, Inc, and the Paulding County Carnegie Library. The Board has scheduled the local public hearing for September 22, 2010 at 5:00 PM at the OSU Extension Center in Paulding, Ohio, and the adjudicatory hearing for October 5, 2010 at 10:00 AM at the PUCO offices in Columbus, Ohio. As discussed earlier in this report, the local public hearing provides interested parties an opportunity to participate in the decision making process. The Applicant submitted proof of publication announcing the hearings on August 5, 2010. The announcement appeared in the *Paulding County Progress* on July 28, 2010.

To date only one party, the Ohio Farm Bureau Federation, has filed a motion to intervene in this proceeding. No letters of support or opposition to the project have been filed.

An application for a certificate of environmental compatibility and public need must include a description of the Applicant's public interaction programs.³³ According to the application, the Applicant has been interacting with the public for nearly two years. Outreach activities include meetings with landowners, community organizations, the general public, and co-sponsoring the 2010 Paulding County Fair. The Applicant published an announcement informing the public of the proposed project in the *Paulding County Progress* and the *Antwerp Bee Argus* on April 7, 2010, and held a public informational meeting on April 20, 2010, at the Wayne Trace School Jr. High Gymnasium in Haviland, Ohio. The Applicant also published several articles about the project and ran several weeks of public service announcements on local radio stations addressing the benefits of wind energy development. The Applicant has provided and continues to provide project status updates to landowners, local public officials, local schools, civic organizations, and others.

Liability Insurance

An application for a certificate of environmental compatibility and public need must also include a description of any insurance programs for providing liability compensation for damages to the public during construction or operation of the proposed facility.³⁴ According to the application, the Applicant will maintain a commercial general liability insurance policy protecting the Applicant and related persons from claims of loss or liability in an amount of not less than \$5 million of combined single limit coverage per occurrence, accident, or incident. Landowners will be named as additional insured on the policy and may receive a certificate of insurance upon request. In addition, the Applicant has agreed to work with the Paulding County Engineer and to establish a bond or similar surety to ensure that all damage to public roads is repaired.

³³ OAC 4906-17-08(E)(1)

³⁴ OAC 4906-17-08(E)(2)

Landowner Leases

The Applicant has entered into lease agreements for the use of approximately 15,000 acres of land in Paulding County. As discussed earlier in this report, the predominant use of land in this area is cultivated row agriculture. Approximately 98 percent of the land leased for this project would be returned to its current use after construction. In addition to the continued productive use of their land, participating landowners would receive additional revenue from annual lease payments for the construction and operation of the wind farm. Those living near, but not hosting components of, the project would also receive annual lease payments through the Applicant's Neighbor Payments Program.

Alternative Energy Portfolio Standard

Amended Substitute Senate Bill Number 221 (SB 221) of the 127th General Assembly requires that, beginning in 2009, a portion of the electricity sold to retail customers in Ohio come from renewable energy resources. Renewable energy resources include solar photovoltaic, wind, hydroelectric, geothermal, biomass, and fuel cell technologies. At least 50 percent of the renewable energy requirement must be satisfied with resources located within the state of Ohio. Electric distribution utilities or electric services companies may at their discretion comply with all or part of the renewable energy benchmark requirements through an electricity supply contract or through the use of renewable energy credits. To be eligible for use towards a benchmark, a renewable energy credit must originate from a renewable energy resource facility certified by the PUCO, though facility certification does not guarantee compliance with annual benchmark requirements or recovery of costs. Further, the electric distribution utility or services company must be a registered member of PJM's generation attribute tracking system, MISO's renewable energy tracking system, or another credible tracking system approved by the PUCO.³⁵

According to the Applicant, SB 221 is the principle impetus for developing clean, renewable energy in Ohio. The power generated from the proposed facility, as claimed by the Applicant, would deliver clean, renewable electricity to the Ohio bulk transmission system. The electricity would either be sold directly to Ohio utilities through a power purchase agreement or on the wholesale market through PJM. Staff believes the proposed facility could play an important role in helping electric distribution utilities and electric services companies in Ohio meet their requirements under the law. The proposed wind farm would likely qualify as an in-state renewable energy resource under SB 221.

Taxation

According to the Applicant, the proposed project would have a significant positive impact on the local tax base. The Applicant anticipates it will pay the maximum real and personal property tax allowed by Senate Bill 232 of \$9,000 per MW of installed nameplate capacity per year, or about \$1,346,400 annually for the life of the project.

Stimulus Bill

The American Recovery and Reinvestment Act of 2009, or Stimulus Bill, directed about \$16.8 billion towards the United States energy industry with the intent of increasing investment in energy efficiency, renewable energy technology, and grid modernization.³⁶ Among other things,

³⁵ ORC 4928.64, Et Seq.

³⁶ American Recovery and Reinvestment Act of 2009. Division A, Title IV of P.L. 111-5. Enacted on February 17, 2009.

the Stimulus Bill provides, until January 1, 2013, for wind facilities, and until January 1, 2014, for other qualified renewable facilities, a renewable energy production credit (i.e., Section 45 credit). It also provides until January 1, 2012 a renewable energy investment credit (i.e., Section 48 credit) and establishes a cash grant (i.e., Section 1603 grant) for any person who places a qualified energy facility into service before the end of 2010. Qualified energy facilities include wind electric generation facilities. Subject to certain limitations, any taxpayer may take advantage of any one of these incentives.³⁷

The Applicant plans to utilize the renewable energy grants made available under the Stimulus Bill. According to the Applicant, construction is anticipated to begin in the fourth quarter of 2010 and should be completed by third quarter 2011. Any delay that would result in the loss of the renewable energy grants provided under the Stimulus Bill could interfere with the Applicant's ability to build the facility and may result in significant economic loss.

Recommended Findings

Staff recommends that the Board find that the proposed facility would serve the public interest, convenience, and necessity, and therefore complies with the requirements specified in ORC Section 4906.10(A)(6), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

³⁷ American Recovery and Reinvestment Act of 2009. Division B, Title I, Subtitle B, Part I *and* Division B, Title I, Subtitle G, Section 1603 of P.L. 111-5. Enacted on February 17, 2009. *See also*, Internal Revenue Service Bulletin: 2009-25. (June 22, 2009). Election of Investment Tax Credit In Lieu of Production Tax Credit; Coordination with Department of Treasury Grants for Specified Energy Property in Lieu of Tax Credits.

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(7)

AGRICULTURAL DISTRICTS

Pursuant to ORC Section 4906.10(A)(7), the Board must determine the facility's impact on the viability as agricultural land of any land in an existing agricultural district within the site of the proposed utility facility.

The agricultural district program was established under ORC Chapter 929. Agricultural land is classified as an agricultural district through an application and approval process that is administered through local county auditors' offices. Within the project area, a total of 23.4 acres of temporary impacts and 4.9 acres of permanent impacts would occur to designated agricultural district land. The impacts to the agricultural district land would not be significant enough to affect the agricultural district designation of any of the properties within the project area.

Construction-related activities such as vehicle traffic and materials storage could lead to temporary reductions in farm productivity caused by direct crop damage, soil compaction, broken drainage tiles, and reduction of space available for planting. However, the Applicant has discussed and approved the siting of facility components with landowners in order to minimize impacts, and also intends to take steps in order to address such potential impacts to farmland, including: repairing all drainage tiles damaged during construction, removing construction debris, compensating farmers for lost crops, and restoring temporarily impacted land to its original use. After construction, only the agricultural land associated with turbines and access roads would be removed from farm production.

Recommended Findings

The Staff recommends that the Board find that the impact of the proposed facility on the viability of existing agricultural land in an agricultural district has been determined, and therefore complies with the requirements specified in ORC Section 4906.10(A)(7), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

CONSIDERATIONS FOR ORC SECTION 4906.10(A)(8)

WATER CONSERVATION PRACTICE

Pursuant to ORC Section 4906.10(A)(8), the proposed facility must incorporate maximum feasible water conservation practices, considering available technology and the nature and economics of the various alternatives.

The Staff has reviewed the information pertaining to the consumptive use of water for the operation of the proposed facility. Wind-powered electric generating facilities do not utilize water in the process of electricity production. Therefore, water consumption associated with the proposed electric generation equipment does not warrant specific conservation efforts. Potable water would be needed for personal use by employees at the planned O&M building, but these needs would be minimal.

Recommended Findings

The Staff recommends that the Board find that the proposed facility would incorporate maximum feasible water conservation practices, and therefore complies with the requirements specified in ORC Section 4906.10(A)(8).

IV. RECOMMENDED CONDITIONS OF CERTIFICATE

Following a review of the application filed by Paulding Wind Farm II LLC and the record compiled to date in this proceeding, the Staff recommends that a number of conditions become part of any certificate issued for the proposed facility. These recommended conditions may be modified as a result of public or other input received subsequent to issuance of this report. At this time the Staff recommends the following conditions:

- (1) That the facility be installed at the Applicant's proposed site as presented in the application filed on May 14, 2010, and as modified and/or clarified by the Applicant's supplemental filings.
- (2) That the Applicant shall utilize the equipment and construction practices as described in the application and as modified and/or clarified in supplemental filings, replies to data requests, and recommendations in this Staff Report of Investigation.
- (3) That the Applicant shall implement the mitigative measures as described in the application and as modified and/or clarified in supplemental filings, replies to data requests, and recommendations in this Staff Report of Investigation.
- (4) That prior to the commencement of construction, the Applicant shall obtain and comply with all applicable permits and authorizations as required by federal and state laws and regulations for any activities where such permit or authorization is required. Copies of permits and authorizations, including all supporting documentation, shall be provided to OPSB Staff within seven (7) days of issuance or receipt by the Applicant.
- (5) That the Applicant shall conduct a pre-construction conference prior to the start of any construction activities, which the OPSB Staff shall attend, to discuss how environmental concerns will be satisfactorily addressed. OPSB Staff shall be notified of any modifications to the final project design at this time.
- (6) That at least sixty (60) days before the pre-construction conference, the Applicant shall file a letter with the Board that identifies which of the turbine models listed in the application has been selected.
- (7) That at least thirty (30) days before the pre-construction conference, the Applicant shall submit to the OPSB Staff, for review and approval, the final turbine foundation design for each turbine location.
- (8) That the Applicant shall not commence construction of the facility until it has a signed Interconnection Service Agreement with PJM, which includes construction, operation, and maintenance of system upgrades necessary to reliably and safely integrate the proposed generating facility into the regional transmission system. The Applicant shall provide a letter stating that the Agreement has been signed or a copy of the signed Interconnection Service Agreement to the OPSB Staff.
- (9) That at least thirty (30) days prior to the pre-construction conference and subject to OPSB Staff review and approval, the Applicant shall create and implement a complaint resolution procedure in order to address potential operational concerns experienced by the public. The Applicant shall work to resolve any issues with those who file a complaint. Any complaint submitted must be immediately forwarded to the OPSB Staff.

- (10) That if any survey or construction work for this project discloses a find of cultural, architectural, or archaeological significance, or a site that could be eligible for inclusion on the National Register of Historic Places, then the Applicant shall submit an amendment, modification, or mitigation plan. Any such mitigation effort shall be developed in coordination with the Ohio Historic Preservation Office, with input from Paulding County Commissioners, and submitted to OPSB Staff for review.
- (11) That no commercial signage or advertisements shall be located on any turbine, tower, or related infrastructure. If vandalism should occur, the Applicant shall remove or abate the damage within thirty (30) days of discovery or as extended by OPSB Staff for good cause shown, to preserve the aesthetics of the project. Any abatement other than the restoration to pre-vandalism condition is subject to approval by OPSB Staff.
- (12) That the Applicant shall avoid, where possible, or minimize to the maximum extent practicable, any damage to field tile drainage systems and soils resulting from construction, operation, and/or maintenance of the facility in agricultural areas. Damaged field tile systems shall be promptly repaired to at least original conditions at the Applicant's expense. Excavated topsoil, with the exception of soil excavated during the laying of cables for the collection system, shall be segregated and restored in accordance with the Applicant's lease agreement with the landowner. Severely compacted soils shall be plowed or otherwise de-compacted, if necessary, to restore them to original conditions unless otherwise agreed to by the landowner.
- (13) That at least seven (7) days before the pre-construction conference, the Applicant shall submit to OPSB Staff a copy of all NPDES permits including its approved Storm Water Pollution Prevention Plan (SWPPP), approved Spill Prevention Containment and Countermeasure (SPCC) procedures, and its erosion and sediment control plan for review and approval. Any soil issues must be addressed through proper design and adherence to the Ohio Environmental Protection Agency best management practices related to erosion and sedimentation control.
- (14) That the Applicant shall employ the following erosion and sedimentation control measures, construction methods, and best management practices when working near environmentally-sensitive areas and/or when in close proximity to any watercourses, in accordance with the Ohio NPDES permit(s) and SWPPP obtained for the project:
 - (a) During construction of the facility, seed all disturbed soil, except within actively cultivated agricultural fields, within seven (7) days of final grading with a seed mixture acceptable to the appropriate County Cooperative Extension Service. Denuded areas, including spoils piles, shall be seeded and stabilized within seven (7) days, if they will be undisturbed for more than twenty-one (21) days. Re-seeding shall be done within seven (7) days of emergence of seedlings as necessary until sufficient vegetation in all areas has been established.
 - (b) Inspect and repair all erosion control measures after each rainfall event of one-half of an inch or greater over a twenty-four (24) hour period, and maintain controls until permanent vegetative cover has been established on disturbed areas.
 - (c) Delineate all watercourses, including wetlands, by fencing, flagging, or other prominent means.

- (d) Avoid entry of construction equipment into watercourses, including wetlands, except at specific locations where construction has been approved.
 - (e) Prohibit storage, stockpiling, and/or disposal of equipment and materials in these sensitive areas.
 - (f) Locate structures outside of identified watercourses, including wetlands, except at specific locations where construction has been approved.
 - (g) Divert all storm water runoff away from fill slopes and other exposed surfaces to the greatest extent possible, and direct instead to appropriate catchment structures, sediment ponds, etc., using diversion berms, temporary ditches, check dams, or similar measures.
- (15) That the Applicant shall remove all temporary gravel and other construction staging area and access road materials after completion of construction activities, as weather permits, unless otherwise directed by the landowner. Impacted areas shall be restored to pre-construction conditions in compliance with the Ohio NPDES permit(s) obtained for the project and the approved SWPPP created for this project.
- (16) That the Applicant shall not dispose of gravel or any other construction material during or following construction of the facility by spreading such material on agricultural land. All construction debris and all contaminated soil shall be promptly removed and properly disposed of in accordance with Ohio EPA regulations.
- (17) That the Applicant shall assure compliance with fugitive dust rules by the use of water spray or other appropriate dust suppressant measures whenever necessary.
- (18) That the Applicant shall have an environmental specialist on site during construction activities that may affect sensitive areas as mutually-agreed upon between the Applicant and OPSB Staff, and as shown on the Applicant's final approved construction plan, including vegetation clearing, areas such as a designated wetland or stream, or in the vicinity of identified mussels (common or federal/state-listed threatened or endangered species) and threatened or endangered species or their identified habitat. The environmental specialist shall be familiar with water quality protection issues and able to field-identify mussels (common or federal/state-listed threatened or endangered species) and potential threatened or endangered species of plants and animals that may be encountered during project construction.
- (19) That prior to construction, the Applicant shall conduct a presence/absence mussel survey within stream segments that will be impacted by trenching activities for the installation of culverts and the underground electric collection system or from potential frac-out as a result of utilizing HDD. All findings from this survey shall be submitted to OPSB Staff and the ODNR, in coordination with the USFWS, for review, comment, and establishment of avoidance, minimization, and mitigation measures. For common mussel species, the Applicant may either relocate components of the facility to avoid identified species locations (mussel concentrations), or include potential relocation of mussels in the required frac-out contingency plan. As part of this plan, the Applicant shall provide survey/relocation methods, details on the survey area(s) and relocation site(s), and establish post-relocation monitoring protocols. All surveys/relocations shall be conducted by an

ODNR-approved malacologist. The post-relocation monitoring shall be for two consecutive years at the recipient relocation site(s) to determine survivorship. A survivorship report shall be submitted to OPSB Staff and the ODNR by December 31 of each consecutive year for review. If federal or state-listed threatened or endangered mussels are found during the survey, the Applicant must avoid the identified species location by relocating facility components, subject to OPSB Staff and ODNR review and approval. If OPSB Staff and the ODNR, in coordination with the USFWS, determine that a significant adverse impact has occurred to threatened or endangered mussels, additional mitigation measures will be prescribed to the Applicant by OPSB Staff in coordination with the ODNR.

- (20) That the Applicant shall utilize HDD, at a minimum, to install an underground electric collection cable under Flatrock Creek and under a high-quality forested floodplain wetland (identified as B-9-B in the "Wetland and Stream Delineation Summary Report" dated August 19, 2010). This site is located approximately 750 feet west of CR33 along Flatrock Creek.
- (21) That the Applicant shall not work in the types of streams listed below during fish spawning restricted periods (April 15 to June 30), unless a waiver is issued by the ODNR and approved by OPSB Staff releasing the Applicant from a portion of, or the entire restriction period.
 - (a) Class 3 primary headwater streams (watershed < one mi²)
 - (b) Exceptional Warmwater Habitat (EWH)
 - (c) Coldwater Habitat (CWH)
 - (d) Warmwater Habitat (WWH)
 - (e) Streams potentially supporting threatened or endangered species
- (22) That prior to the first turbine becoming operational, the Applicant shall develop a post-construction avian and bat mortality monitoring plan in conjunction with methodologies outlined in ODNR's *On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio*, for OPSB Staff review and approval. The monitoring shall be conducted for a minimum of one season (April 1 to November 15), with the possibility of a second season of monitoring at the discretion of OPSB Staff in coordination with the DOW.
- (23) That the Applicant shall adhere to seasonal cutting dates of October 1 through March 31 for removal of suitable Indiana bat habitat trees, if avoidance measures cannot be achieved.
- (24) That OPSB Staff, the ODNR, and the USFWS shall be immediately contacted if threatened or endangered species are encountered during construction and operation activities. Construction activities that could adversely impact the identified plants or animals shall be halted until an appropriate course of action has been agreed upon by the Applicant, OPSB Staff, and the ODNR in coordination with the USFWS. If threatened or endangered species are encountered during operation activities, then the above referenced notification is required. Nothing in this provision shall preclude agencies having jurisdiction over the facility with respect to threatened or endangered species from exercising their legal authority over the facility consistent with law.

- (25) That the Applicant shall conform to any drinking water source protection plan, if it exists, for any part of the facility that is located within drinking water source protection areas of the local villages and cities.
- (26) That the Applicant shall complete a full detailed geotechnical exploration and evaluation at each turbine site to confirm that there are no issues to preclude development of the wind farm. The geotechnical exploration and evaluation shall include borings at each turbine location to provide subsurface soil properties, static water level, rock quality description (RQD), percent recovery, and depth and description of the bedrock contact and recommendations needed for the final design and construction of each wind turbine foundation, as well as the final location of the transformer substation and interconnection substation. The Applicant must fill all boreholes, and borehole abandonment must comply with state and local regulations. The Applicant shall provide copies of all geotechnical boring logs to the OPSB Staff and to the ODNR Division of Geological Survey prior to construction.
- (27) That the Applicant shall comply with the turbine manufacturer's most current safety manual and shall maintain a copy of that safety manual in the O&M building of the facility.
- (28) That the Applicant shall become a member of the Ohio Utilities Protection Service prior to commencement of operation of the facility. Notification of membership shall be provided to OPSB Staff.
- (29) That at least thirty (30) days before the pre-construction conference, the Applicant shall submit to the OPSB Staff, for review, a proposed emergency and safety plan to be used during construction, to be developed in consultation with the fire department(s) having jurisdiction over the area. Before the first turbine is operational, the Applicant shall submit to the OPSB Staff, for review, a fire protection and medical emergency plan to be used during operation of the facility, which shall be developed in consultation with the first responders having jurisdiction over the area.
- (30) That the Applicant shall restrict public access to the site with appropriately placed warning signs or other necessary measures.
- (31) That the Applicant shall instruct workers on the potential hazards of ice conditions on wind turbines.
- (32) That the Applicant shall provide the final delivery route plan and the results of any traffic studies to OPSB Staff and to the Paulding County Engineer thirty (30) days prior to the pre-construction conference. The Applicant shall complete a study on the final equipment delivery route to determine what improvements will be needed in order to transport equipment to the wind turbine construction sites. The Applicant shall make all improvements outlined in the final delivery route plan prior to equipment and wind turbine delivery. The Applicant's study and delivery route plan shall consider, but not be limited to, the following:
 - (a) Perform a survey of the final delivery routes to determine the exact locations of vertical constraints where the roadway profile will exceed the allowable bump and dip specifications and outline steps to remedy vertical constraints.

- (b) Identify locations along the final delivery routes where overhead utility lines may not be high enough for over-height permit loads and coordinate with the appropriate utility company if lines must be raised.
 - (c) Identify roads and bridges that are not able to support the projected loads from delivery of the wind turbines and other facility components and make all necessary upgrades.
 - (d) Identify locations where wide turns would require modifications to the roadway and/or surrounding areas and make all necessary alterations. Any alterations for wide turns shall be removed and the area restored to its pre-construction condition unless otherwise specified by the county engineer(s).
- (33) That the Applicant repair damage to roads and bridges caused by construction activity. Any damage will be repaired promptly to its pre-construction state by the Applicant under the guidance of the appropriate regulatory agency. Any temporary improvements shall be removed unless the county engineer(s) request that they remain. The Applicant shall provide financial assurance to the counties that it will restore the public roads it uses to their pre-construction condition. The Applicant shall also enter into a Road Agreement with the county engineer(s) prior to construction and subject to OPSB Staff review. The Road Agreement shall contain the following:
- (a) A pre-construction survey of the conditions of the roads.
 - (b) A post-construction survey of the condition of the roads.
 - (c) An objective standard of repair that obligates the Applicant to restore the roads to the same or better condition as they were prior to construction.
- (34) That the Applicant shall obtain all required county and township transportation permits and all necessary permits from ODOT. Any temporary or permanent road closures necessary for construction and operation of the proposed facility shall be coordinated with the appropriate entities including, but not limited to, the Paulding County Engineer, ODOT, local law enforcement, and health and safety officials.
- (35) That at least thirty (30) days prior to the pre-construction conference and subject to Staff review and approval, the Applicant shall model the expected project noise contribution at the exterior of all non-participating residences within one mile of the facility boundary at critical wind speed calculated in accordance with ISO 9613-2 standard day conditions assuming moderate downwind propagation.
- (36) That if pre-construction acoustic modeling indicates a project contribution that exceeds the project area nighttime L_{EQ} (41 dBA) by greater than five dBA at the exterior of any non-participating residences within one mile of the facility boundary, the project shall be subject to further study of the potential impact and possible mitigation prior to construction. Mitigation, if required, shall consist of either reducing the impact so that the project contribution does not exceed the facility ambient nighttime L_{EQ} (41 dBA) by greater than five dBA, or other means of mitigation approved by OPSB Staff and the Applicant in consultation with the affected receptor(s).
- (37) That after commencement of commercial operation, the Applicant shall conduct further review of the impact and possible mitigation of all project noise complaints. Mitigation

shall be required if the project contribution at the exterior of any non-participating residence within one mile of the project boundary exceeds the greater of: (1) the project ambient nighttime L_{EQ} (41 dBA) plus five dBA; or (2) the validly measured ambient L_{EQ} at the location of the complaint and during the same time of day or night as that identified in the complaint plus five dBA. Mitigation, if required, shall consist of either reducing the impact so that the project contribution does not exceed the greater of: (1) the project ambient nighttime L_{EQ} (41 dBA) plus five dBA; or (2) the validly measured ambient L_{EQ} plus five dBA, or other means of mitigation approved by OPSB Staff and the Applicant in consultation with the affected receptor(s).

- (38) That general construction activity shall be limited to the hours of 7:00 a.m. to 7:00 p.m., or until dusk when sunset occurs after 7:00 p.m. This limitation shall not apply to nacelle, tower, and rotor erection activities which may need to be carried out during low-wind, nighttime hours for safety reasons. Impact pile driving and blasting operations, if required, shall be limited to the hours between 7:00 a.m. to 7:00 p.m., Monday through Friday. Construction activities that do not involve noise increases above ambient levels at sensitive receptors are permitted outside of daylight hours when necessary. The Applicant shall notify property owners or affected tenants within the meaning of Rule 4906-5-08(C)(3), OAC, of upcoming construction activities including potential for nighttime construction activities.
- (39) That any turbine forecasted prior to construction to create in excess of 30 hours per year of shadow flicker at a non-participating habitable receptor within 1,000 meters shall be subject to further review and possible mitigation. Mitigation shall be completed before commercial operation commences and consist of either reducing the turbine's forecasted impact to 30 hours per year, or other measures approved by OPSB Staff and the Applicant in consultation with the affected receptor(s).
- (40) That, prior to construction, the Applicant shall submit the final layout and turbine locations to the National Telecommunications and Information Administration for review and approval. Any concerns identified regarding obstruction to microwave or other communication systems shall be forwarded to the OPSB Staff for review and approval prior to construction.
- (41) That the Applicant must meet all recommended and prescribed Federal Communications Commission and other federal agency requirements to construct an object that may affect communications and, subject to OPSB Staff approval, mitigate any effects or degradation caused by wind turbine operation. For any residence that is shown to experience degradation of TV reception due to the facility operation, the Applicant shall provide, at its own expense, cable or direct broadcast satellite TV service.
- (42) That at least thirty (30) days before the pre-construction conference, the Applicant shall submit to the OPSB Staff, for review and approval, a licensed microwave report based on the final turbine layout.
- (43) That any turbines modeled to have the potential to interfere with existing microwave paths in the project area shall be subject to further review and possible mitigation. Mitigation shall be completed prior to construction and consist of either shifting the location of the turbine locations so as to not affect any existing microwave paths, or other measures approved by OPSB Staff, the Applicant, and the affected path licensee(s).

- (44) That any turbine observed to create microwave communication interference to existing paths shall be subject to mitigation. If required, the Applicant shall propose mitigation consisting of either reducing the impact so as to not affect the path, or other measures approved by OPSB Staff, the Applicant, and the affected path licensee(s).
- (45) That the Applicant meet all Federal Aviation Administration (FAA) and federal agency requirements to construct an object that may affect existing local and/or long-range radar, and mitigate any effects or degradation caused by wind turbine operation as required by the FAA.
- (46) That if any turbine is determined to cause NEXRAD (Next-Generation Radar) interference, the Applicant shall propose a technical or administrative work plan, protecting proprietary interests in wind speed data, that provides for the release of real-time meteorological data to the National Weather Service office in Wilmington, Ohio. If an uncontrollable event should render this data temporarily unavailable, the Applicant shall exert reasonable effort to restore connectivity in a timely manner.
- (47) That the Applicant must meet all recommended and prescribed FAA and ODOT Office of Aviation requirements to construct an object that may affect navigable airspace. This includes submitting all final turbine locations for ODOT Office of Aviation and FAA review prior to construction, and the non-penetration of any FAA *Part 77* surfaces.
- (48) That thirty (30) days prior to any construction, the Applicant notify, in writing, any owner of an airport located within two (2) miles of the project boundary, whether public or private, whose operations, operating thresholds/minimums, or landing/approach procedures and/or vectors are expected to be altered by the siting, operation, maintenance, or decommissioning of the facility.
- (49) That all applicable structures be lit in accordance with FAA circular 70/7460-1 K Change 2, *Obstruction Marking and Lighting*; Chapters 4, 12, and 13 (Turbines); or as otherwise prescribed by the FAA.
- (50) That the Applicant shall comply with the following conditions regarding decommissioning:
 - (a) That the Applicant shall provide a final draft of the decommissioning plan to OPSB Staff and the Paulding County Engineer for review, and for OPSB Staff approval, at least thirty (30) days prior to the pre-construction conference. In this plan, the Applicant shall:
 - (i) Indicate the future use that is proposed to be made of the land following reclamation.
 - (ii) Describe the following: engineering techniques proposed to be used in decommissioning and reclamation and a description of the major equipment; a plan for the control of surface water drainage and of water accumulation; and a plan, where appropriate, for backfilling, soil stabilization, compacting, and grading.
 - (iii) Describe how the Applicant will implement best management practices to control impacts to surface or ground water resources. If necessary, the Applicant will obtain permits from the Ohio EPA and/or the U.S. Army Corps of Engineers.

- (iv) Provide a detailed timetable for the accomplishment of each major step in the decommissioning plan, including the steps to be taken to comply with applicable air and water quality laws and regulations and any applicable health and safety standards.
- (b) That the facility owner and/or operator shall, at its expense, complete decommissioning of the wind-powered electric generating facility, or individual wind turbines, within (12) twelve months after the end of the useful life of the facility or individual wind turbines. If no electricity is generated for a continuous period of twelve (12) months, or if the OPSB deems the facility or turbine to be in a state of disrepair warranting decommissioning, the wind energy facility or individual wind turbines will be presumed to have reached the end of its useful life.
- (c) That decommissioning shall include the removal of all physical material pertaining to the wind energy facility to a depth of at least thirty-six (36) inches beneath the soil surface and restoration of the disturbed area to substantially the same physical condition that existed before erection of the facility. The foundation for each wind turbine shall be removed to the depth of thirty-six (36) inches or to the top of the foundation spread footing, whichever depth is greater. Decommissioning shall include the restoration of roads and bridges in a manner as required by the Road Agreement between the Applicant and the county engineer(s); the removal and transportation of the wind turbines off-site; and removal of buildings, cabling, electrical components, access roads, and any other associated facilities, unless otherwise mutually agreed upon by the Applicant and the landowner. Disturbed earth shall be re-graded, re-seeded, and restored to substantially the same physical condition that existed immediately before erection of the facility. Damaged field tile systems shall be repaired to at least original conditions.
- (d) That if the owner of the proposed wind-powered electric generating facility does not complete decommissioning within the period prescribed in these conditions, the OPSB may take action as necessary to complete decommissioning, including requiring forfeiture of financial securities. The entry into a landowner agreement constitutes agreement and consent of the parties to the agreement, their respective heirs, successors and assigns, that the Board may take action that may be necessary to implement the decommissioning plan, including the exercise by the Board, OPSB Staff, and contractors, of the right of ingress and egress for the purpose of decommissioning the wind-powered electric generating facility.
- (e) That the decommissioning funds or financial assurance shall be released by the holder of the funds or financial assurance when the facility owner has demonstrated, and the Board concurs, that decommissioning has been satisfactorily completed, or upon written approval of the Board in order to implement the decommissioning plan.
- (f) That during decommissioning, all recyclable materials, salvaged and non-salvaged, shall be recycled to the furthest extent possible. All other non-recyclable waste materials shall be disposed of in accordance with state and federal law.
- (g) That the Applicant shall leave intact any improvements made to the electrical infrastructure, pending approval by the applicable regional transmission organization and interconnection utility.

- (h) That subject to approval by OPSB Staff, and within five years after the start date of commercial operation, an independent and registered Professional Engineer, licensed to practice engineering in the state of Ohio, shall be retained by the wind generation facility owner to estimate the total cost of decommissioning in current dollars, without regard to salvage value of the equipment (*Decommissioning Costs*), and the cost of decommissioning net salvage value of the equipment (*Net Decommissioning Costs*). Said estimate shall include: (1) an analysis of the physical activities necessary to implement the approved reclamation plan, with physical construction and demolition costs based on ODOT's *Procedure for Budget Estimating and RS Means* material and labor cost indices; (2) the number of units required to perform each of the activities; (3) an amount to cover contingency costs, not to exceed 10 percent of the above calculated reclamation cost. Said estimate should be on a per-turbine basis and shall be submitted for OPSB Staff review and approval within the first five years of facility operation and every fifth year thereafter.
 - (i) The owner shall post and maintain decommissioning funds or financial assurance according to the following schedule:
 - (i) Prior to commencement of construction of each turbine foundation through year five of commercial operation of the project, five thousand dollars (\$5,000) per partially or fully-constructed wind turbine.
 - (ii) From year six of commercial operation of the project through the end of the life of each turbine, the greater of (a) ten thousand dollars (\$10,000) per partially or fully-constructed wind turbine, (b) fifteen (15) percent of the Decommissioning Costs, or (c) one hundred twenty (120) percent of the Net Decommissioning Costs.
 - (j) The form of financial assurance will be a financial instrument mutually agreed upon by OPSB Staff and the Applicant and conditioned on the faithful performance of all requirements and conditions of this application's approved decommissioning and reclamation plan. At least thirty (30) days prior to the pre-construction conference, the Applicant shall provide an estimated timeline for the posting of decommissioning funds based on the construction schedule for each turbine. At least thirty (30) days prior to commencement of construction, the Applicant shall provide a statement from the holder of the financial assurance demonstrating that adequate funds have been posted. Once the financial assurance is provided, the Applicant shall maintain such funds or assurance throughout the remainder of the applicable term and shall adjust the amount of the assurance, if necessary, to offset any increase or decrease in the decommissioning costs at the end of the applicable term. The value of salvaged steel and copper, at the end of the five-year term and for any other revisions of this report thereafter, shall be calculated based on the five-year annual average for the years preceding the anniversary of such reports.
- (51) That at least thirty (30) days before the pre-construction conference, the Applicant shall submit to the OPSB Staff, for review and approval, the following documents:
- (a) One set of detailed engineering drawings of the final project design, including all turbine locations, collection lines, access roads, the crane route, permanent meteorological towers, substations, construction staging areas, and any other associated facilities and access points, so that the OPSB Staff can determine that the final project

design is in compliance with the terms of the certificate. The final project layout shall be provided in hard copy and as geographically-referenced electronic data. The final plan shall include both temporary and permanent access routes, as well as the measures to be used for restoring the area around all temporary sections, and a description of any long-term stabilization required along permanent access routes. The plan shall consider the location of streams, wetlands, wooded areas, and sensitive plant species as identified by the ODNR Division of Natural Areas and Preserves, and explain how impacts to all sensitive resources will be avoided or minimized during construction, operation, and maintenance.

- (b) A stream and/or wetland crossing plan including details on specific streams and/or ditches to be crossed, either by construction vehicles and/or facility components (e.g., access roads, electric collection lines), as well as specific discussion of proposed crossing methodology for each stream crossing and post-construction site restoration. The stream crossing plan shall be based on final plans for the access roads and electric collection system.
 - (c) A detailed frac-out contingency plan for stream and wetland crossings that are expected to be completed via HDD. Such contingency plan may be incorporated within the required stream and/or wetland crossing plan.
 - (d) A tree clearing plan describing how trees and shrubs around turbines, along access routes, in electric collection line corridors, at construction staging areas, and in proximity to any other project facilities will be protected from damage during construction, and, where clearing cannot be avoided, how such clearing work will be done so as to minimize removal of woody vegetation. Priority should be given to protecting mature trees throughout the project area, and all woody vegetation in wetlands and riparian areas, both during construction and during subsequent operation and maintenance of all facilities.
- (52) That if any changes are made to the project layout after the submission of final engineering drawings, all changes shall be provided to OPSB Staff in hard copy and as geographically-referenced electronic data. All changes outside the environmental survey areas and any changes within environmentally-sensitive areas will be subject to OPSB Staff review and approval prior to construction.
- (53) That any wind turbine site proposed by the Applicant but not built as part of this project shall be available for Staff review in a future case.
- (54) That if construction has commenced at a turbine location and it is determined that the location is not a viable turbine site, that site shall be restored to its original condition within 30 days.
- (55) That within sixty (60) days after the commencement of commercial operation, the Applicant shall submit to the OPSB Staff a copy of the as-built specifications for the entire facility. If the Applicant demonstrates that good cause prevents it from submitting a copy of the as-built specifications for the entire facility within 60 days after commencement of commercial operation, it may request an extension of time for the filing of such as-built specifications. The Applicant shall use reasonable efforts to provide as-built drawings in both hard copy and as geographically-referenced electronic data.

- (56) That the certificate shall become invalid if the Applicant has not commenced a continuous course of construction of the proposed facility within five (5) years of the date of journalization of the certificate.
- (57) That the Applicant shall provide to the OPSB Staff the following information as it becomes known:
 - (a) The date on which construction will begin;
 - (b) The date on which construction was completed;
 - (c) The date on which the facility began commercial operation.

APPENDIX

1. DOCKETING RECORD

CASE NUMBER: 10-0369-EL-BGN

DESCRIPTION: Paulding Wind Farm II LLC

FILINGS AS OF: 9/7/2010

09/03/2010	Follow-up letter stating that one of the 220 mailed was unable to be forwarded, filed by M. Petricoff on behalf of Paulding Wind Farm LLC.
09/02/2010	Notice of filing response to Staff data request filed on behalf of Paulding wind Farm II LLC by H. Petricoff.
09/01/2010	Notice of filing supplemental study reports filed by H. Petricoff on behalf of Paulding Wind Farm II LLC.
08/31/2010	Notice of filing response to staff data request filed by M. H. Petricoff on behalf of Paulding Wind Farm II LLC.
08/31/2010	Notice that turbine locations 6, 11, 27, 28, 30 and 60 will not need developed, filed by M. H. Petricoff on behalf of Paulding Wind Farm II LLC.
08/30/2010	Notice of failed delivery of two different addresses filed by H. Petricoff on behalf of Paulding Wind Farm II LLC.
08/25/2010	Letter stating two different mailings to Ohio and Indiana filed by H. Petricoff on behalf of Paulding Wind Farm II LLC.
08/24/2010	Letter notifying of inability to forward letters to parties filed by H. Petricoff on behalf of Paulding Wind Farm II LLC and Timber Road II Project.
08/23/2010	Correspondence to indicate that we received eighteen letters back from the U.S. Postal Service. Fourteen of those letters were marked "return to sender, not deliverable as addressed, unable to forward." Two of the letters were marked "return to sender, vacant, unable to forward." Two of the letters were marked "return to sender, no such number, unable to forward." Those names and addresses are listed on Attachment 1 to this letter filed on behalf of Paulding Wind Farm II LLC by H. Petricoff.
08/19/2010	Correspondence stating that seven (7) letters sent to property owners or affected tenants of the Timber Road II Project were returned with forwarding addresses and mailed to updated addresses as shown in Attachment A, filed by M. Petricoff.
08/16/2010	Paulding Wind Farms sample letter sent out to property owners or affected tenants within the meaning of this rule and list showing all addresses, filed by H. Petricoff.
08/12/2010	Notice that turbine location 108 will not be developed filed by S. Howard on behalf of Paulding Wind Farm II, LLC.
08/11/2010	Proof of publication filed by S. Howard on behalf of Paulding Wind Farm II LLC. (Paulding County)
08/05/2010	Proof of publication filed by S. Howard on behalf of Paulding Wind Farm II LLC. (Paulding County)
08/04/2010	Notice that turbine locations 7, 8, 9, and 10 will not be developed filed by M.

	Settineri on behalf of Paulding Wind Farm II LLC.
07/15/2010	Service Notice
07/15/2010	Entry ordering that a local public hearing will be held on September 22, 2010, at 5:00 p.m., at the OSU Extension Center, 503 Fairground Drive, Paulding, Ohio 45879 and the adjudicatory hearing will commence on October 5, 2010, at 10:00 a.m., 11th Floor, Hearing Room C, at the offices of the Public Utilities Commission of Ohio, 180 East Broad Street, Columbus, Ohio 43215. (HHPG)
07/13/2010	Notice of certificates being serviced filed by M. Petricoff on behalf of Paulding Wind Farm.
07/13/2010	Notice that a check in the amount of the required filing fee has been delivered to the Fiscal Division of the Public Utilities Commission of Ohio, filed by M. Petricoff on behalf of Paulding Wind Farm LLC.
07/06/2010	Response letter to Mr. Petricoff on behalf of the Ohio Power Siting Board filed by A. Schriber.
06/22/2010	Service Notice
06/21/2010	Entry granting Paulding Wind II's waiver requests in accordance with the conditions specified in finding (3); granting motion for protective order and OFBF's motion to intervene. (KKS)
06/10/2010	Letter accepting the Staff's recommended disposition of each of the requested waivers contained in the May 13, 2010 motion for waivers and their intentions with respect to each rule filed by M.H. Petricoff on behalf of Paulding Wind Farm II, LLC.
06/10/2010	Letter from the United States Department of Commerce, National Telecommunications and Information Administration, indicating that no federal agencies represented in the Interdepartment Radio Advisory Committee had any concerns regarding blockage of their radio frequency transmissions from the Timber Road II Wind Project in Paulding County, Ohio filed by M.H. Petricoff.
06/10/2010	Well survey results conducted by Hull & Associates, Inc., filed by M.H. Petricoff on behalf of Paulding Wind Farm II, LLC.
05/28/2010	Motion to intervene and memorandum in support of the Ohio Farm Bureau Federation filed by L. Gearhardt.
05/28/2010	Memorandum regarding applicant's waiver requests, electronically filed by Mr. Christopher K. Cunningham on behalf of Mr. Klaus Lambeck. electronically filed by Mr. Christopher K Cunningham on behalf of Lambeck, Klaus Mr.
05/14/2010	Application continued. (Part 2 of 2)
05/14/2010	Application filed on behalf of Paulding Wind Farm II LLC, a wholly owned subsidiary of Horizon Wind Energy LLC for certificate to install numerous electricity generating wind turbines in Paulding County, Ohio. (Part 1 of 2)
05/14/2010	Confidential document target: Technical documentation (13 pages) filed by S. Howard on behalf of Timber Road II Wind Farm.
05/14/2010	Motion for protective order and memorandum in support filed by M. H. Petricoff on behalf of Paulding wind Farm II, LLC.

05/14/2010	Volume III: Exhibit N-Exhibit U (section 3 of 4) continued.
05/14/2010	Volume III: Exhibit N-Exhibit U (section 2 of 4) continued.
05/14/2010	Volume III: Exhibit N-Exhibit U. (Section 1 of 4)
05/14/2010	Volume III: Exhibit N-Exhibit U, continued. (Section 4 of 4)
05/14/2010	Volume II: Exhibit A-Exhibit M, continued. (Section 2 of 3)
05/14/2010	Volume II: Exhibit A-Exhibit M. (Section 1 of 3)
05/14/2010	Volume II: Exhibit A-Exhibit M, continued. (Section 3 of 3)
05/13/2010	Motion for waiver and memorandum in support filed by M.H.Petricoff on behalf of Paulding Wind Farm II, LLC.
04/21/2010	Proof of Publication filed. (Paulding County)
04/14/2010	Proof of Publication. (Paulding County)
04/02/2010	In the matter of the pre-application notification letter for Paulding Wind Farm II, LLC regarding the Timber Road II Wind Farm.



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