



Department of Energy

Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3393

DOE/EA-1777

FINDING OF NO SIGNIFICANT IMACT

The State of Ohio Lincoln Electric's Wind Energy Project in Euclid, OH

AGENCY: U.S. Department of Energy, Golden Field Office

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE prepared an environmental assessment (EA) (DOE/EA-1777) analyzing the potential environmental impacts of allowing Ohio to use \$1 million of its State Energy Program (SEP) funds for a grant to assist in the financing of the construction and operation of the Lincoln Electric Company (LEC) wind energy project in Euclid, Cuyahoga County, Ohio. Based on the information and analyses in the EA, DOE has determined that its Proposed Action (allowing Ohio to use a portion of its SEP funds to finance the wind energy project) does not constitute a major federal action that would significantly affect the quality of the human environment within the meaning of National Environmental Policy Act NEPA. Therefore, an environmental impact statement (EIS) is not required, and DOE is issuing this FONSI.

PROPOSED ACTION: DOE's Proposed Action is to allow Ohio to use a portion of the State's SEP funds for a grant to assist in the financing of a wind energy project in order to facilitate Ohio's achievement of the objectives of the SEP. Ohio proposes to provide \$1 million in SEP funds to LEC to construct and operate a one-turbine wind energy project at the LEC Headquarters that would provide up to 2.5 megawatts of generating capacity. Electricity generated by the project would be used by LEC in its existing headquarters manufacturing operations.

ENVIRONMENTAL IMPACTS: Areas of potential environmental impacts analyzed in the EA include land use, biological resources, noise, visual quality, transportation, groundwater and surface water, soils, air quality and climate change, socioeconomics and environmental justice, energy impacts, cultural resources, human health and safety, floodplains and wetlands, waste management, wild and scenic rivers, and intentional destructive acts. DOE identified no potentially significant environmental impacts on these resource areas.

Primary areas of environmental concern for operation of wind turbine are the potential to injure or kill birds and bats and visual impacts associated with installation of the wind turbine. Analysis in the EA indicates that the proposed project will have no adverse affects on federally-listed Indiana bats or other federally listed species. There is the potential for impacts to migratory birds. Recommendations as described in the United States Fish and Wildlife Service (USFWS) *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003) were included in the siting, design and installation plans for the LEC wind project. Based on the analysis in the EA, and in consideration of USFWS recommendations, DOE determined that impacts to migratory birds were not significant.



The EA analyzed potential visual impacts related to shadow flicker for nearby residents. Fourteen residents were determined to have some potential for flicker affects. However, LEC has agreed to provide blinds and/or shade trees to residents that may be affected by shadow flicker.

The project proponents have made a number of commitments to the Ohio Department of Wildlife (ODOW), the USFWS the Ohio Historic Preservation Office (OHPO) and nearby residents that would eliminate or reduce potential adverse impacts to migratory birds and other resources.

Nothing in the EA or this FONSI affects the project proponents' obligations to comply with the laws of the United States, including the Endangered Species Act, Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act Nothing in the EA or this FONSI limits the USFWS's regulatory and permitting authorities under these or any other statutes.

ALTERNATIVE CONSIDERED: In addition to its Proposed Action, DOE analyzed a No-Action Alternative in which DOE would not allow Ohio to use its SEP funds to finance some of the costs of this project DOE assumed for purposes of the EA that the project would not proceed without SEP funding.

PUBLIC AVAILABILITY: DOE sent notices announcing the availability of the Draft EA for public comment to the USFWS, the Federal Aviation Administration (FAA), National Telecommunications and Information Administration (NTIA), ODOW, and Ohio Department of Transportation (ODOT), OHPO, along with adjacent property owners, and the City of Euclid Planning and Zoning. The DOE sent hard copies of the EA to the OHPO and the Consulting Party List determined as part of the Section 106 Consultation which included: the City of Euclid, City of Euclid Historic Landmarks Commission, Euclid Historic Museum and Euclid Historical Society, Cleveland Restoration Society, Urban Design Center of Northeast Ohio, Cuyahoga County Government, Cuyahoga County Planning Commission, First Suburbs Development Council, Western Reserve Historical Society and the Western Reserve Heritage Association. On July 8, 2010 the Notice of Availability was published in the *Cleveland Plain Dealer* indicating that the Draft EA had been posted on the *Golden Reading Room* website on July 8, 2010. A link to the *Golden Reading Room* website and the Draft EA was also posted on the City of Euclid's website on July 8, 2010.

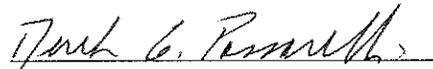
A total of seven comments were received. Six were in support of the project and one comment from the USFWS requested clarification regarding migratory birds and that DOE coordinate with the USFWS Region 3 programmatic consultation that is underway. To address the USFWS comments revisions were made to Section 3.2.2.2 of the EA, Biological Resources and a statement related to migratory birds was corrected. The USFWS also requested that post-construction monitoring protocols be coordinated with USFWS Region 3 offices. A comment response matrix, containing all comments received has been added to the Final EA as Appendix E.

DETERMINATION: Based on the project proponent's commitments to ODOW, the USFWS and residents that may be affected by flicker effects, and the analyses in the EA, DOE has concluded that that its Proposed Action (allowing Ohio to use a portion of its SEP funds to finance the wind energy project) does not constitute a major federal action that would significantly affect the quality of the human environment within the meaning of NEPA. Therefore, preparation of an environmental impact statement is not required, and DOE is issuing this FONSI.

Copies of the Final EA are available at the DOE Golden Field Office Public Reading Room website at http://www.go.doe.gov/Reading_Room.aspx; or from:

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Issued in Golden, CO, this 4th day of August, 2010.



Derek G. Passarelli
Acting Golden Field Office Manager
DOE Golden Field Office

FINAL ENVIRONMENTAL ASSESSMENT
DOE'S PROPOSED FINANCIAL ASSISTANCE
TO OHIO FOR
LINCOLN ELECTRIC'S WIND ENERGY
PROJECT

EUCLID
CUYAHOGA COUNTY, OHIO

U.S. Department of Energy Golden Field Office
1617 Cole Boulevard
Golden, Colorado 80401-3305



August 2010

RESPONSIBLE AGENCY: U.S. Department of Energy (DOE)

TITLE: *Final Environmental Assessment: DOE's Proposed Financial Assistance to Ohio for Lincoln Electric's Wind Energy Project, Euclid, Cuyahoga County, Ohio*

CONTACT: For additional copies or more information on this environmental assessment (EA), please contact:

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Abstract: Lincoln Electric proposes to construct and operate a 2.5 MW single turbine wind energy project at Lincoln Electric's World Headquarters facility located at 22800 Saint Clair Avenue, Euclid, Ohio. The wind turbine would provide 2.5 MW of renewable energy to fulfill up to ten percent (10%) of the Lincoln Electric Headquarters' annual electricity demand and help to reduce greenhouse gas emissions. Ohio proposes to provide the project a \$1.0 million grant, which would come from a formula grant that Ohio received from DOE pursuant to the Department's State Energy Program. This EA analyzes the potential environmental impacts of the proposed construction and operation of the Lincoln Electric Wind Energy project and the alternative of not implementing this project.

Public Involvement: The public was provided with an opportunity to comment on this EA via email or written correspondence. Details regarding the comment process are located in Section 1.4 of this document. Public comments and responses are included in Appendix E.

ACRONYMS AND ABBREVIATIONS

ARRA	American Recovery and Reinvestment Act of 2009
AWEA	American Wind Energy Association
BMP	Best Management Practice
CNS	Covenant Not to Sue
CO	carbon monoxide
CFR	Code of Federal Regulations
CEQ	Council on Environmental Quality
CLG	Certified Local Government
dB	decibel
dBA	decibel on an A-weighted scale, used to approximate the human ear's response to sound
DOE	U.S. Department of Energy
EA	environmental assessment
ECTV	Euclid community television channel
EMF	Electromagnetic fields
EP	Euclid Plant
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FONSI	finding of no significant impact
FR	Federal Register
GHG	greenhouse gas
IBA	Important Bird Area
IGBT	Insulated Gate Bipolar Transistor
IPCC	Intergovernmental Panel on Climate Change
KCMIL	Thousand Circular Mil
kip	1,000 pounds-force
kN	kilonewton
LEC	Lincoln Electric Company
MW	Megawatts
NAD	North American Datum
NEPA	National Environmental Policy Act
NFA	No Further Action
NHPA	National Historic Preservation Act
NO ₂	nitrogen dioxide
NOA	Notice of Availability
NOACA	Northeast Ohio Areawide Coordinating Agency
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NTIA	National Telecommunication and Information Administration
NWI	National Wetlands Inventory
OAI	Ohio Archaeological Inventory
OEPA	Ohio Environmental Protection Agency
OHI	Ohio Historic Inventory
OHPO	Ohio Historic Preservation Office
ODNR	Ohio Department of Natural Resources

ODOD	Ohio Department of Development
ODOW	Ohio Department of Wildlife
ONHP	Ohio Natural Heritage Program
O ₃	ozone
Pb	lead
PM	particulate matter
PM ₁₀	particulates less than 10 µm in diameter
PM _{2.5}	particulates less than 2.5 µm in diameter
RFP	Request for Proposals
SEP	State Energy Program
SO ₂	sulfur dioxide
SVOC	Semi-volatile organic compound
Ub	Urban land (soil type)
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
V	Volt
VOC	Volatile organic compound

Note: The vertical lines in the margin of this document indicate substantive changes between the Draft EA and Final EA.

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SUMMARY

Lincoln Electric Company (LEC) is proposing to construct and operate a single 2.5 megawatts (MW) wind turbine energy project at their World Headquarters facility located in Euclid, Ohio, at the southeast corner of East 222nd Street and St. Clair Avenue in an area zoned General Industrial Districts (U-6) by the City of Euclid (*City of Euclid Planning and Zoning Code Chapter 1359.1*). The Ohio Department of Development Energy Resources Division (ODOD) selected this project to receive a \$1.0 million grant from the State Energy Office because the wind turbine will serve as a demonstration of wind turbine technology in the State of Ohio. Ohio's State Energy Office grant to LEC would come from money that Ohio received from the U.S. Department of Energy's (DOE) State Energy Program (SEP). The purpose of the DOE's SEP is to promote the conservation of energy and reduce dependence on imported oil by helping states develop comprehensive energy programs and by providing them with technical and financial assistance.

The turbine model proposed for the LEC site is a Kenersys K100 2.5 MW turbine designed to be mounted on a monopole made of tubular conical steel segments. The turbine/tower would stand 135 meters (443 feet) at its tallest extent. The 2.5MW turbine would provide approximately 10 percent of electricity used by LEC that is currently supplied by First Energy Solutions, which generated approximately 60 percent of its total electricity with fossil fuels in 2009.

LEC assessed the proposed turbine site as well as four other sites located on the LEC property. The site proposed by LEC was chosen for several reasons including access and clearance underneath the turbine for potential ice falls. Through LEC's process with the City of Euclid and through media exchanges, the public was provided with more than 14 opportunities over the past nine months to learn about the project and to provide comments to the City of Euclid.

Based on the analyses described below in section 1.5 and section 3.2, it was concluded that installation of the wind turbine would have no effects on wetlands, floodplains, historic properties, threatened or endangered species, avian species, soils, air quality, water quality, radio and television interference, social and economic conditions, and minority or low-income populations.

The project would impact other resources, as described below.

Land Use – Temporary disturbance during construction and permanent loss of 0.37 acre of land where the foundation would be placed.

Visual impacts – Introduction of a dominant vertical element into the existing viewshed and shadow flicker will be experienced by 17 structures in the project vicinity for more than 30 hours per year.

Noise – There would be temporary noise impacts during the construction phase, however, the project site is within an industrial area where ambient noise levels are high. Noise impacts are not anticipated during operation of the wind turbine.

Human Health and Safety – The tower impact zone, in the event the tower collapses was determined to be a 278 foot radius and ice throw radius was determined to be approximately 150

feet. No residences are located within the 278 foot radius and tower collapse is extremely rare. Potential impacts to human health and safety are not considered significant.

1.0 INTRODUCTION

1.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) NEPA regulations (40 CFR Parts 1500 to 1508), and DOE's NEPA implementing regulations (10 CFR Part 1021) require that DOE consider the potential environmental impacts of a proposed action before making a decision. This requirement applies to decisions about whether to provide different types of financial assistance to states and private entities.

In compliance with these regulations, this Environmental Assessment (EA) examines the potential environmental impacts of the Proposed Action and the No-Action Alternative. When complete, this EA will provide DOE with the information needed to make an informed decision about whether allowing Ohio to use a portion of its SEP funds for the proposed LEC Wind Project may result in significant environmental impacts. Based on the Final EA, DOE has issued a Finding of No Significant Impact (FONSI), which may include applicant-committed measures.

1.1.1 Background

Lincoln Electric Company (LEC) is proposing to construct and operate a single 2.5 MW wind turbine energy project at LEC's World Headquarters facility that would provide approximately ten percent (10%) of its annual electric demand and help to reduce greenhouse gas emissions (See Figures 1 to 4 in Appendix A for project location mapping). The Lincoln Electric Company, an Ohio Company headquartered in Euclid, designs and manufactures materials, equipment and welding solutions for a wide variety of activities, including alternative energy projects. The current estimated project cost is \$6.5 million. The Ohio Department of Development Energy Resources Division (ODOD) selected this project to receive a \$1.0 million grant from the State Energy Office because the wind turbine will serve as a demonstration of wind turbine technology in the State of Ohio.

Ohio's State Energy Office grant to LEC would come from money that Ohio received from the DOE's SEP. The purpose of the DOE's SEP is to promote the conservation of energy and reduce dependence on imported oil by helping states develop comprehensive energy programs and by providing them with technical and financial assistance. States can use SEP funds for a wide variety of activities related to energy efficiency and renewable energy. *See generally* 42 U.S.C. § 6321 *et seq.* and 10 CFR Part 420. In the *American Recovery and Reinvestment Act of 2009* (Pub. L. 111-5, 123 Stat. 115; Recovery Act; ARRA), Congress appropriated \$3.1 billion to DOE's SEP and the State of Ohio received \$96,083,000 million pursuant to a Federal statutory formula for distributing these funds.

Ohio informed DOE that it proposes to provide \$1.0 million of its SEP funds to the LEC Wind Project. The potential use of Federal SEP funds to assist in the financing of this project constitutes a Federal action subject to review under NEPA. Therefore, DOE has prepared this *Final Environmental Assessment: DOE's Proposed Financial Assistance to Ohio for Lincoln Electric Wind Energy Project, Euclid, Cuyahoga County, Ohio* (DOE/EA-1777) to evaluate the potential environmental impacts of DOE's Proposed Action (that is, financial assistance to LEC

for the proposed wind turbine project from funding provided to the Ohio SEP) and of a No-Action Alternative (not allowing use of SEP funds and assuming, therefore, that the project would not proceed). This EA will inform DOE and the public of the potential environmental consequences of these alternatives and help identify any mitigating measures that DOE should consider if SEP funds are authorized for this project.

1.2 Purpose and Need

1.2.1 DOE's Purpose and Need

DOE's purpose and need is to ensure that SEP funds are used for activities that meet Congress' statutory aims to improve energy efficiency, reduce dependence on imported oil, decrease energy consumption, or promote renewable energy. However, it is not DOE's role to dictate to Ohio how to allocate its funds among these objectives or to prescribe the projects it should pursue.

1.2.2 Ohio's Purpose and Need

Ohio's purpose and need is to grow the economy of the state by connecting companies and communities to financial and technical resources to deploy renewable energy technologies, and to support the goals of SEP and ARRA to reduce energy costs, reduce reliance on imported energy, reduce the impacts of energy production and energy use on the environment, and to preserve and create jobs.

1.3 Ohio's SEP Project Selection Process

The Ohio SEP is using its ARRA funding for programs to increase the energy efficiency of businesses and industry while promoting deployment of clean energy projects that will help improve the cost-effectiveness and economic stability of businesses and industry in the state. Ohio has developed a revolving loan program to improve access to capital for energy efficiency and renewable energy projects through a public-private partnership using SEP dollars in tandem with debt or equity investment participation. This low-interest financing is made available for a variety of renewable energy projects and helps to expand the availability of financing based on energy savings, including for smaller commercial entities.

ODOD's SEP program includes five sub-programs:

- Developing Renewable Energy in Ohio
- Making Efficiency Work
- Targeting Industry Efficiency
- Banking on New Energy Financing
- Setting the Stage for Ohio's Carbon Management Strategy

ODOD issued a Request for Proposals (RFP) for the SEP funded Deploying Renewable Energy in Ohio Program and used the following criteria for selection: project readiness; matching capabilities, financing, and cost effectiveness; economic impact for Ohio; project characteristics and potential for innovation; and a project's ability to: (1) provide emission-free energy; and (2) create jobs during the construction of the project. A criterion of the SEP grant program is that

funds must be fully obligated by September 30, 2010, and SEP funded projects must be fully operational by March 2012. LEC was one of eight (8) wind energy grant applicants awarded SEP funds by ODOD in 2009. A total of \$5,831,000 was awarded to these eight applicants. For this project, DOE is the Federal action agency, while ODOD is the recipient of Federal funding and LEC is the sub recipient of this funding. The project will be implemented on LEC's property.

1.4 Public and Agency Involvement

LEC has been in consultation with the City of Euclid and Cuyahoga County officials concerning the project since the Spring of 2009. Opportunities for public involvement have occurred over the past nine months in an attempt to educate the public about this project and provide an opportunity for public comment. At the City of Euclid Planning and Zoning Commission Meeting held on January 12, 2010, where LEC's request for a required height exemption was considered, no objections to the project were received. This meeting was advertised, open to the public, and abutting property owners to the project were specifically notified and invited. A timeline of public outreach efforts follows:

Various dates from August 18, 2009 to May 11, 2010:

- Euclid Mayor Bill Cervenik's Community presentation on Citywide Development. These are PowerPoint presentations that include slides and a discussion about the proposed Lincoln Electric Wind turbine. Given to various civic groups and homeowners associations (See Attachment D-1a in Appendix D for list of presentations).

November 30, 2009:

- ODOD Press Release (See Attachment D-1b).
- City of Euclid Press Release (See Attachment D-1c).
- City of Euclid Website (See Attachment D-1d).
- Crain's Cleveland Business Article (See Attachment D-1e).

December 1, 2009:

- Cleveland Plain Dealer Article (See Attachment D-1f).
- News Herald Article (See Attachment D-1g).

January 4, 2010:

- Letters sent to abutting property owners notifying them of LEC's request for a required height exemption to install a 443' high, 2.5MW wind turbine located at 22800 St. Clair Avenue that would be considered at the January 12, 2010 City of Euclid Planning and Zoning

Committee meeting (See Attachment D-1h for copy of letter and mailing list and Attachment D-1i for maps of the notified property owners).

January 12, 2010:

- City Of Euclid Planning and Zoning Commission Meeting held where LEC's request for a required height exemption was considered and approved (See Attachment D-1j for the Planning and Zoning Commission Regular Meeting Finished Agenda/Minutes).

Various dates from January 13 to January 20, 2010:

- Broadcast of January 12, 2010 City Of Euclid Planning and Zoning Commission Meeting on Euclid community television channel, ECTV (See Attachment D-1k for the broadcast schedule).

Various dates from January 20 to February 3, 2010:

- The proposed wind turbine project was a topic of discussion on Mayor Cervenik's "Our Town" ECTV program (See Attachment D-1k for the broadcast schedule).

Various dates from January 20 to March 30, 2010:

- City Councilwoman Madeline Scarniench's presentations to various civic groups and homeowners associations concerning the wind turbine project. The wind turbine project is within Ms. Scarniench's City Council Ward (See Attachment D-1l for email from City Councilwoman Madeline Scarniench documenting her public outreach efforts).

May 2010:

- City of Euclid issues Spring/Summer 2010 Newsletter (mailed to all citizens, available on City website: <<http://www.cityofeuclid.com/news/35>>). This newsletter includes an article concerning the proposed wind turbine (See Attachment D-1m for the excepted article).

In addition, the following agencies and organizations have been contacted by LEC and/or DOE:

- United States Fish and Wildlife Service (USFWS)
- Federal Aviation Administration (FAA)
- United States Department of Commerce – National Telecommunications and Information Administration (NTIA)
- Ohio Historic Preservation Office (OHPO)
- Ohio Department of Natural Resources (ODNR), Division of Wildlife (ODOW)
- Ohio Department of Natural Resources (ODNR), Natural Heritage Program (ONHP)
- Ohio Department of Transportation Office of Aviation
- Ohio Department of Development Energy Resources Division
- City of Euclid Community Services and Economic Development
- Cuyahoga County Department of Development

Draft Environmental Assessment

The Draft EA was open for public comment for 15 days (July 9-24, 2010). A Notice of Availability (NOA) and public comment procedures for the EA were prepared that referenced the public's ability to comment on the proposed project's potential effects on the social, environmental, and economic factors were sent to potential stakeholders and interested parties (i.e., Federal, state, tribal and local agencies, as well as members of the public [hereinafter "public"]). The NOA for the EA clearly identified that the Public would have an opportunity to comment on project's potential effects per the NEPA process. Additionally, DOE conducted its Section 106 Consultation under the National Historic Preservation Act (NHPA) concurrent with its NEPA evaluation for the LEC project. The public was afforded the opportunity to comment on historic resources via the same method for commenting on the EA. All comments related to historic resources received were provided to the Ohio Historic Preservation Office, as were DOE responses. The NOA was published in the *Cleveland Plain Dealer* (See Attachment D-1n in Appendix D), and the City of Euclid website (See Attachment D-1o in Appendix D).

The EA was posted on the Golden Reading Room website, allowing the opportunity to comment on-line via email or via written correspondence to the postal address provided therein. At the conclusion of the 15-day comment period (July 24, 2010), DOE analyzed all submitted comments and questions.

A total of seven comments were received during the comment period. Six of the comments were in support of the project as proposed. The remaining comment was from the USFWS requesting clarification on migratory bird concerns. After consideration and analysis, Section 3.2.2 of this EA was revised to clarify measures taken to protect migratory birds and to address USFWS concerns. Additionally, responses to all comments were written and posted on the website (See Public Comments and Responses in Appendix E). Members of the public whose comments identified contact information received a copy (digital or written) of the response to their comment. Response to public comments preceded the filing of a FONSI for the project.

1.5 Considerations Not Carried Forward for Further Analysis

Consistent with NEPA implementing regulations and guidance, DOE focuses the analysis in an EA on topics with the greatest potential for significant environmental impact. For the reasons discussed below, the Proposed Action is not expected to have any measurable effects on certain resources, and the description and analyses of these resources are not carried forward into Chapter 3.

Floodplains and Wetlands

Pursuant to 10 CFR Part 1022, DOE reviewed the USFWS National Wetlands Inventory (NWI) maps (See Figure 5 in Appendix A) and Federal Emergency Management Agency (FEMA) floodplain maps (See Figure 6 in Appendix A) and identified no floodplains, wetlands, or surface water sources such as streams or drainage channels located on the proposed project site or that could be affected by the construction and operation of the wind turbine.

Waste Management

Solid wastes that are anticipated to be generated during construction include equipment packaging materials and construction-related material debris. Solid wastes generated during

operation of the turbines would be minimal. Solid wastes that are anticipated to be generated during decommissioning include dismantled equipment and construction-related material debris. Hazardous, regulated non-hazardous, and universal wastes are not anticipated to be generated during construction, operation, or decommissioning. All wastes generated over the life of the proposed project would be handled, collected, transferred, and disposed of in accordance with all applicable Federal, state, and local regulations. Used oil (e.g., spent gear box oil, hydraulic fluid, and gear grease) is not considered a waste because it can be reused and/or recycled. Used oil would be generated during operations of the proposed project. LEC currently has an oil recycling program for used oil from the factory machinery. LEC recycles used oil per internal specification EHS 390 "Procedure for Storage, Handling and Disposal of Waste Water/Used Oils." This specification references Ohio Administrative Code 3745-279-20 through 3745-279-24. All used oil from the wind turbine would be handled, collected, transferred, and reused/recycled in accordance with this existing recycling program, as well as in accordance with applicable Federal, state, and local regulations.

Wild and Scenic Rivers

DOE requested natural heritage information, including the presence of any state or Federal wild and scenic rivers in the project vicinity from the Ohio Natural Heritage Program (ONHP). Their response indicates that no Ohio Scenic Rivers or waterways included in the National Wild and Scenic River System occur in the project vicinity (See Attachment C-1 in Appendix C). The closest Ohio Scenic River is the Chagrin River, located in Lake County (approximately 6.5 miles east of the proposed project site). The proposed project would not impact Federal or state wild and scenic rivers.

Intentional Destructive Acts

DOE considers intentional destructive acts (i.e., acts of sabotage or terrorism) in all its EAs and environmental impact statements (DOE 2006). Construction and operation of this wind energy project would not involve the transportation, storage, or use of radioactive, explosive, or toxic materials. The Proposed Action would not offer any particularly attractive targets of opportunity for terrorists or saboteurs to inflict adverse impacts to human life, health, or safety.

2.0 PROPOSED ACTIONS AND ALTERNATIVES

2.1 DOE's Proposed Action

DOE's Proposed Action is to allow Ohio to use its SEP funds for a grant to assist in the financing of the LEC Wind Project in order to facilitate Ohio's achievement of the objectives of their SEP.

2.2 Ohio's Proposed Project

The ODOD selected LEC for a \$1.0 million grant based on the following criteria: project readiness; match, financing, and cost effectiveness; economic impact for Ohio; project characteristics and potential for innovation; and its ability to: (1) provide emission-free energy; and (2) create jobs during the construction of the project. This project is DOE's Federal action for purposes of NEPA review, while ODOD is the recipient of Federal funding and LEC is the sub recipient of this funding. The project will be implemented on LEC's property in Euclid, Ohio.

The turbine model chosen for the LEC site is a Kenersys K100 2.5 MW turbine with a 100 meter (328 feet) rotor diameter and an 85 meter (278.9 feet) tower height. The turbine has three arms, each 48.7 meters (159.8 feet) long (See Attachment D-2 in Appendix D for turbine specifications [K100 Data Sheet]). Overall, the turbine/tower will stand 135 meters (443 feet) at its tallest extent.

The Kenersys K100 turbine is designed to be mounted on a monopole made up of tubular conical steel segments. This design eliminates the need for guy wires for support of the wind turbine. Guy wires can be a challenge for birds and bats to locate and maneuver around, which can lead to injury or death. The proposed design does not include the use of lattice towers for support either, which have become roosting sites for birds at other wind projects.

Proposed Site

The proposed LEC Wind Energy project would be located at LEC's corporate offices at the southeast corner of East 222nd Street and St. Clair Avenue in an industrial park in the City of Euclid, Cuyahoga County, Ohio (See Figures 1-4 in Appendix A for project location maps). The lot on which the project is proposed is in a U-6 Industrial and Manufacturing zoning district (per the City of Euclid). It is a 34-acre parcel located within a much larger predominantly industrial tract. This project will be specifically located on a site that has been previously disturbed (graded) as a private recreational field owned and maintained by LEC. The ground disturbing activities for this project will be confined to a 10.2-acre portion of the property that is currently used for recreational purposes for LEC employees. The approximate center point of the LEC Wind Turbine is located at Latitude /Longitude 41°35'4.89" N, 81°31'32.81"W [North American Datum (NAD) 1983]. A photolog of the project area is included in Appendix B.

Construction

Site construction would include installation of the turbine, transformer, electrical distribution wiring, necessary access roads and road improvements, crane pads, foundation systems, and fencing (See Figure 2-1 and Attachment D-2a in Appendix D).

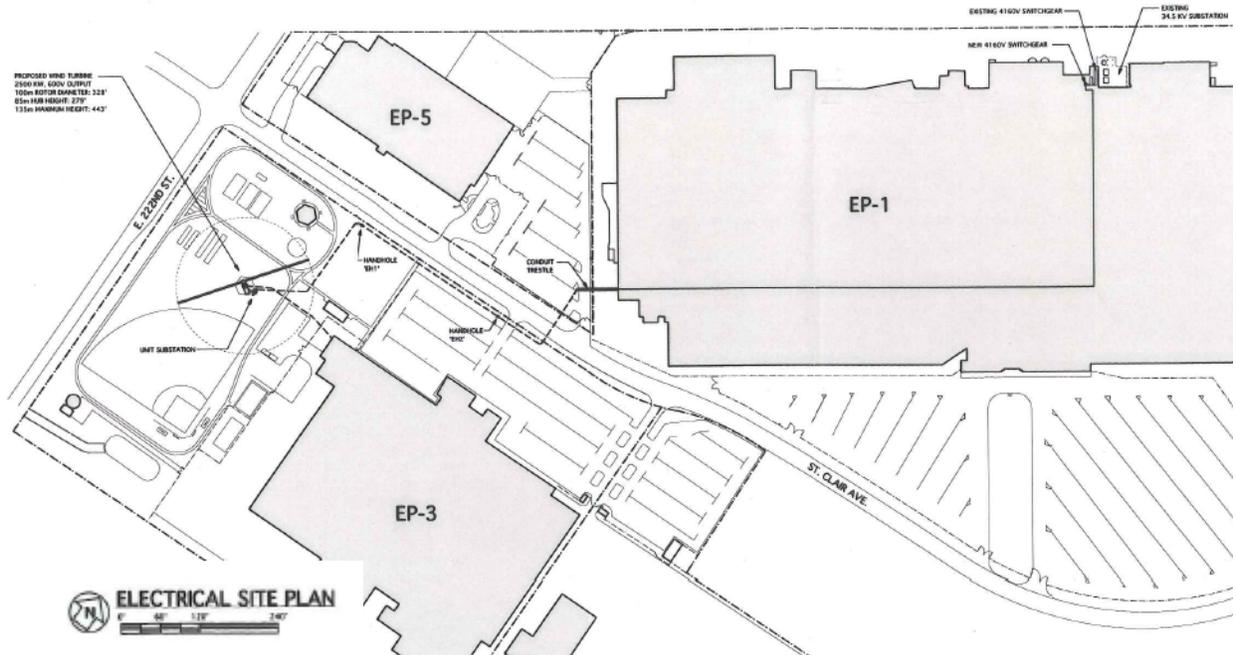


Figure 2-1. LEC Wind Turbine Electrical Site Plan.

The turbine nacelle and blades would be shipped from Europe and arrive at the Port of Cleveland. The nacelle and blades would be transferred to tractor trailers designed for the load. Travel to the Project site is anticipated to be via OH-Route 2 to Interstate 90, utilizing Euclid Avenue (Exit 186) heading west on Euclid Avenue and turning right on Chardon Road, then right onto E 200th Street followed by another a right on to Saint Clair Avenue. Access to the construction site is via the existing access driveway at 22800 Saint Clair Avenue (EP3 Facility – Distribution Center – building directly east of the project site). The tractor trailers are anticipated to continue around the south of Lincoln’s EP3 facility on an existing driveway and unload at the west side of the EP3 facility near the turbine site. The tower sections would be fabricated in the Midwestern United States and anticipated to be shipped via tractor trailers taking the same local route to the site. Other construction vehicles are anticipated to access the site from Interstate 90 to the Babbitt Road exit, head south on to Babbitt Road and west onto Saint Clair Avenue to the EP3 facility entrance driveway. All material staging would be at the turbine site on existing concrete truck staging areas and inside the LEC employee recreational area on the baseball field. The LEC recreational area would be closed during construction and staging.

The electrical system of the Kenersys turbine would consist of a full conversion converter system with a synchronous generator, passive rectifier at the generator side and Insulated Gate Bipolar Transistor- (IGBT)-converter to the grid for full power conversion. The generator would never be connected to the grid directly. The output of the turbine would be 600 volts.

The transformer and switch gear cubicle would be situated outside of the tower of the wind turbine at foundation level under outside ambient conditions. The low voltage side of the transformer would be connected to a distribution panel at the tower base inside the tower, by cable connection leading through the foundation of the turbine.

To adequately distribute the power from the turbine to the main manufacturing facility the following would be installed:

- (2) 1,200 Feet of 4" underground conduits (2,400 feet total length)
- (1) 100 Foot Long Conduit Trestle
- (2) 1850 Feet of 4" Rigid Conduit (3700 feet total length)
- (6) 3150 Feet of 250 Thousand Circular Mil (KCMIL) Wire (18,900 feet total length)
- (2) 3150 Feet of #2/0 Ground Wire (6300 feet total length)
- (1) 4160 Volt Switchgear on Concrete Housekeeping pad
- (1) 20 Foot Section of Bus Duct to interconnect into Lincoln's existing 4160V Switchgear
- (1) Production Meter (See Diagram 1 and Attachment D-2a in Appendix D)

The output of the turbine would be transformed from 600V to 4160V at the Unit Substation located outside the turbine at ground level. From there, two sets of conductors would carry the service to the main manufacturing plant via two underground conduits (1200 feet each), up to a 100 foot long conduit trestle at the west end of the manufacturing facility and into the plant. The underground conduit would transfer to two 4" Rigid Conduits at the base of the trestle and continue on east into the plant for approximately 1,200 feet and then turn north and continue on for 480 feet towards the switchgear room. The conduit will tie into a new 4160 Volt switchgear located at Lincoln's switchgear room. The new switchgear will be tied into Lincoln's existing switchgear with a 20-foot section of bus duct. The output of the turbine would then feed into Lincoln's manufacturing load.

During construction, the crane pad would be 70 feet away from foundation base. The access road would be about 200 feet long. Fencing would be installed around the turbine and transformer and would consist of 250 linear feet (80-foot diameter) of 7-foot-tall chain link fence with three strands of barbed wire on top and a locked access gate.

The foundation would be composed of 500 cubic yards of reinforced concrete. The foundation would require 45 tons of reinforcing steel (See Attachment C-5e - Appendix C).

Construction would be performed in accordance with an approved erosion and sedimentation control plan and in compliance with all other applicable requirements. Construction activities for wind turbine foundations, tower erection, turbine nacelle placement, and blade installation are contingent on temperature and weather conditions. Turbine nacelle and blade installations would be installed during calm wind periods. Foundations would not be installed during cold winter months. These and similar factors would determine the final construction timeline.

The wind turbine installation, including site preparation, erection, and final commissioning, generator installation, and overall systems tie-in and start-up is planned to be completed within approximately twelve (12) months of groundbreaking. During this 12 month period the site would see activity for approximately five months. Two months at the beginning of the 12 month period for excavation and foundation work, and three months at the end of the 12 month period for electrical work, tower erection, turbine & blade installation and startup. The follow is an approximate breakdown of the work activity:

- Excavation (2 weeks)

- Foundation and Reinforcing Work (8 weeks)
- Electrical Distribution, including directional boring for underground conduit, conduit trestle, in-plant conduit installation, and switchgear installation at existing switchgear room (12 weeks)
- Tower erection (1 week)
- Turbine Nacelle and Blade installation (2 weeks)
- Electrical tie-in and interconnection (2 weeks)
- Turbine and system commissioning (2 weeks)
- Site cleanup and recreation facility restoration (1 week)

Construction activities will occur within a 10 acre footprint which is used as open space within the private recreational complex used currently for the benefit of LEC employees. During construction the recreation facility would be closed and secured via existing fencing and locked gates to prevent employees and the public from entering the work zone. The recreation facility would be restored to its previous employee-only recreational usage. The turbine and transformer would be surrounded by 250 linear feet (80-foot diameter) of seven-foot tall chain link fence with three strands of barbed wire on top. The recreation facility is open between April 15 and Oct 15 from Dawn to Dusk. The recreation facility is monitored 24/7 via closed circuit security cameras from a central security control station located in the main manufacturing plant. Security personnel are on site at all times.

Aviation Lighting

Aviation lighting would be in compliance with the FAA [FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13 (Turbines)] to minimize bird and bat impacts. White strobe lights would be used at the minimum number, minimum intensity and minimum number of flashes per minute allowable by the FAA. Solid red or pulsating red warning lights would be avoided. The project has received final approval from the FAA (see Attachment C-2 in Appendix C).

Operations and Maintenance

LEC would operate and maintain the wind energy project according to operating, maintenance, and safety procedures and requirements specifically recommended by the turbine's manufacturer, Kenersys (Kenersys, 2009a, 2009b, and 2009c). All LEC workers will be properly trained for turbine maintenance and safety. Routine maintenance of the turbine would be necessary to maximize performance and identify potential problems or maintenance issues. The turbine would be remotely monitored daily to ensure operations are proceeding efficiently. Any problems would be reported to LEC operations and maintenance personnel, who would perform both routine maintenance and most major repairs. Most servicing would be performed up-tower, without using a crane to remove the turbine from the tower. In addition, all access roads and the pad would be regularly inspected and maintained to minimize erosion.

Decommissioning

The turbine and other infrastructure are expected to have a useful life of at least 20 years. Retrofitting the turbine with upgrades may allow the turbine to produce efficiently for many years after the original useful life. When the project is terminated, the turbine and other infrastructure will be decommissioned and all facilities will be removed to a depth of

approximately 3 feet below grade. The soil surface would be restored as close as possible to its original condition. Underground facilities will either be removed or safely secured and left in place. Salvageable items (including fluids) will be sold, reused, or recycled as appropriate; unsalvageable material will be disposed of at authorized and approved disposal sites. All decommissioning construction activities will be performed in accordance with the manufacturer's guidelines (Kenersys, 2010) as well as all applicable Federal, state, and local regulations.

2.3 Alternatives

2.3.1 DOE Alternatives

Ohio's SEP funds are from a formula grant – the amount is determined pursuant to a formula established in DOE's SEP grant procedures at 10 CFR 420.11. Allocation of funds among the states is based on population and other factors. Recipients of these formula grants have broad discretion in how they use these funds. Accordingly, DOE's alternatives to its Proposed Action relating to Ohio's use of its SEP funds are limited to: (1) any alternatives that Ohio is still considering in regards to this project; and (2) prohibiting Ohio from providing a grant to this project. The second alternative is equivalent to the No-Action Alternative described below. Ohio has informed DOE that it is not considering any "project-specific" alternatives for the LEC Wind Project. Additionally, there are no unresolved conflicts concerning alternative uses of available resources associated with the project site that would suggest the need for other alternatives.

2.3.2 No-Action Alternative

Under the No-Action Alternative, DOE would not allow Ohio to use its SEP funds for this project. DOE assumes for purposes of this EA that the project would not proceed without SEP funding. Using this assumption allows a comparison between the potential impacts of the project as proposed and the impacts of not proceeding with the project. Without the proposed project, LEC operations would continue as otherwise planned, but without the proposed wind turbine. Also, unavoidable adverse impacts associated with the proposed project if it were not to be implemented, include:

- long-term loss of approximately 0.37 acre of vegetation resulting from the construction of the tower foundation
- an increase in noise levels during construction and operation
- introduction of another dominant vertical element into the existing viewshed
- shadow flicker impacts for a limited number of residences
- a risk of tower collapse within 278 feet of the tower

2.3.3 Siting Alternatives Considered by LEC

Siting Considerations

LEC considered five sites for the location of the wind turbine at its World Headquarter Campus (Campus) in Euclid, Ohio. All of the potential Campus sites are owned by LEC and are similar for environmental considerations such as wildlife impact avoidance, wetland and stream

avoidance, and compatibility with existing zoning and land uses. Considerations that then became important for LEC's turbine siting within the Campus are the following:

- Ease of access and adequate room for construction and maintenance
- Minimization of disruption to LEC's manufacturing operations
- Minimization of wind turbulence due to adjacent buildings
- Adequate room for a winter ice clear zone

See Figure 7 in Appendix A for turbine location alternatives discussed below.

Original (Preferred and Proposed) Location

The preferred and currently proposed location for the turbine is situated in an open field near the middle of LEC's employee recreation area on the south side of Saint Clair Avenue and east of East 222nd Street (Site O,P on Figure 7, Appendix A). This location would provide the least disruption to LEC's manufacturing operations. Further, this site provides room for blade laydown, erection cranes and construction vehicles.

Alternate Site #1

Alternate Site #1 is also located in the park, but closer to LEC's Euclid Plant 3 (EP3). The site was eliminated from consideration as the height of the building could cause considerable turbulence to the blades.

Alternate Site #2

Alternate Site #2 is located in the east side of the EP3 yard where LEC has tractor-trailer staging for its distribution center located in EP3. This area was eliminated from consideration for two reasons: the tractor-trailer traffic could cause damage to the structure, and falling ice from the stopped blades in the winter would require an additional clear zone around the structure. This additional clear zone would cause the loss of the trailer staging area.

Alternate Site #3

Alternate Site #3 is located in the east parking lot of EP1/2. This site was eliminated from consideration for three reasons: the height of the building could cause considerable turbulence to the blades, vehicle traffic could cause damage to the structure, and falling ice from the stopped blades in the winter would require an additional clear zone around the structure that would result in the loss of employee parking spaces.

Alternate Site #4

Alternate Site #4 is located in the yard behind EP4. The site was eliminated from consideration as the height of the building could cause considerable turbulence to the blades. This site also lacked room for erection cranes and construction vehicles.

2.3.4 Required Agency Permits and Approval Types

Prior to construction, all required Federal, state and local permits and approvals would be obtained. The required permits and approvals are listed in Table 2-1.

Table 2-1. Federal, State and Local Permits and Approvals

Agency	Permit Approval / Type
Federal	
Federal Aviation Administration (FAA)	FAA Aeronautical Determination
NTIA	Radio Frequency Transmission Approval
USFWS	Compliance with the Endangered Species Act, the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act.
State	
Ohio EPA	NPDES
Ohio Historic Preservation Office	Compliance with the National Historic Preservation Act
Ohio Department of Wildlife	Concurrence that the proposed action does not pose a substantial risk to state-protected species, including birds (pursuant to Ohio Revised Code Chapter 1531).
Local	
City of Euclid Planning & Zoning Commission	Height Variance Approval (<i>City of Euclid Planning and Zoning Code Chapter 1379</i>)
City of Euclid Community Engineer	Erosion and Sediment Control Plan Approval

2.3.5 Project Proponent-Committed Practices

LEC has committed to the following measures and procedures to minimize or avoid environmental impacts if the Proposed Action is carried forward.

Bird, Bat, and Raptor Avoidance and Minimization Measures

Project coordination occurred with the US Fish & Wildlife Service (USFWS), the Ohio Department of Natural Resources (ODNR) Division of Wildlife (ODOW), and ODNR Natural Heritage Program (ONHP) concerning the project’s location and potential impacts on birds, bats, and other wildlife; rare, threatened and endangered species, and other protected natural features. ODOW stated that although the proposed turbine location is relatively close to the Lake Erie shoreline, it is within a highly developed region of the state and lacks suitable breeding or stopover habitat (See Attachment C-3 in Appendix C). Additionally, there are no nests of protected species of raptor (bald eagle, northern harrier, osprey, or peregrine falcon) or observations of Indiana bat (state and Federal endangered species) within five (5) miles of the site. Based on these factors, ODOW issued a letter for the proposed LEC project on March 11, 2010 wherein they determined it is unlikely that this turbine will impact significant numbers of birds or bats (See Attachment C-3 in Appendix C). ODOW’s March 11, 2010 letter requested that LEC conduct or arrange access for someone appointed by ODOW to conduct post-construction monitoring in accordance with the “*On-shore bird and bat pre- and post-construction monitoring protocol for commercial wind energy facilities in Ohio*”(protocol) developed by ODOW.

LEC will conduct or arrange access for ODOW to conduct mortality studies as described below. On April 26, 2010, the USFWS issued a letter concurring with ODOW’s request for post-construction monitoring and asked to be provided with a copy of any such report. LEC will work with ODOW to ensure the USFWS is copied on all such reports (See Attachment C-4 in Appendix C). The protocol for post-construction mortality surveys is as follows:

- One initial year (1 April to 15 November) of daily mortality searches with an optional second season depending on the first year results.
- The results of the mortality searches would be submitted to ODNR Division of Wildlife and U.S. Fish and Wildlife Service for review.
- Depending on the results of the first year, ODNR Division of Wildlife will determine if post-construction monitoring of mortality in the second year can be waived, reduced (i.e., focused on time periods when higher numbers of fatalities were detected), or continued for a full year.

Health, Safety and Noise

The construction contractor and LEC will prepare a Health and Safety Plan per Occupational Safety and Health Administration (OSHA) requirements, as well as Kenersys guidelines (Kenersys, 2009a, 2009b, and 2009c) before commencing work. Facilities will be secured by fencing and include high-voltage warning signs. All construction activities will occur during normal working hours to avoid noise and other disturbances to surrounding areas. The construction of the proposed wind energy project will comply with all applicable Federal, state, and local requirements.

Flicker Effects

Of the 17 receptors exceeding 30 hours shadowing per year, 3 were identified as “P” participating (Lincoln-owned buildings), and “N” for non-participating. Of the 17 exceeding 30 hours per year, 14 receptors (residences) may require mitigation action. LEC will install shadow control equipment for the Kenersys turbine. The shadow control equipment will have the ability to decrease shadowing to a certain threshold by curtailing turbine operation. If shadow impacts remain a legitimate annoyance for the receptor(s), LEC would assist those receptors to purchase blinds for windows and screening trees.

Erosion Control

LEC will use Best Management Practices (BMPs) and employ NPDES requirements during construction and operation to protect topsoil and to minimize soil erosion. BMPs will include at a minimum the following: containing excavated material, use of silt fences, protecting exposed soil, stabilizing restored material, and revegetating disturbed areas.

Recycling

Used oil will be generated during operation of the proposed project, and will be handled, collected, transferred, and reused/recycled in accordance with applicable Federal, state, and local regulations. LEC currently has an oil recycling program for used oil from the factory machinery. LEC recycles used oil per internal specification EHS 390 “Procedure for Storage, Handling and Disposal of Waste Water/Used Oils.” This specification references Ohio Administrative Code 3745-279-20 through 3745-279-24. All used oil from the wind turbine would be handled, collected, transferred, and reused/recycled in accordance with this existing recycling program, as well as in accordance with applicable Federal, state, and local regulations.

Decommissioning

Upon the reaching of the expected operational life (20 years or longer) of the wind turbine, LEC will decommission the turbine as per the guidelines issued by the manufacturer (Kenersys, 2010) and in accordance with applicable Federal, state, and local standards and regulations.

Cultural Resources

Based on the archaeological study results, encountering archaeological resources during excavation activities is not anticipated. However, if archaeological resources were identified in areas that would be excavated, all ground disturbing activities would be halted and the Ohio Historic Preservation Office would be consulted for resolution.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

3.1 No-Action Alternative

If the LEC Wind Energy Project is not implemented, the 10 percent of LEC's electrical power that could be provided by the project would continue to be purchased from First Energy Solutions. That utility generated about 60 percent of its total electricity with fossil fuels in 2009. The remaining 40 percent of generation came from sources that do not directly emit carbon dioxide (renewables and nuclear) [First Energy, 2005; USDOE Energy Information Administration (USDOE EIA), 2010]. Thus, carbon dioxide emissions from electricity generation to serve the LEC facility would be higher under the No-Action alternative and LEC would not meet its objective to reduce its carbon footprint.

Baseline conditions would continue pursuant to current LEC plans. Under the No-Action alternative, there would be no impacts to the area's visual resources, no noise impacts, and no shadow flicker impacts as a result of the project. The small number of jobs created by construction and operation of the wind turbine would not be realized and the local area would forego the economic benefit associated with these new jobs. Additionally, the opportunity to showcase the region's ability to use wind energy would be lost.

3.2 Ohio's Proposed Project

3.2.1 Land Use

The proposed project site is bounded to the north by a four-rail wide CSX rail corridor ("CSX") and an eight-lane divided interstate highway ("I-90"). To the south lies Norfolk Southern Railroad. The land use pattern in the vicinity of the proposed wind energy project is industrial and manufacturing. The City of Euclid (Figure 8 in Appendix A) shows the project area zoned U6 – Industrial and Manufacturing Districts. The wind turbine will be approximately 1,200 feet from the nearest residential zoning to the northwest. Although the area is zoned industrial, there are three houses that have been converted to multi-family units located approximately 330 feet away from the proposed turbine site. Just to the northwest of the proposed project site is a small area zoned U4 – Local Retail of Wholesale Districts. The area immediately surrounding the proposed tower location is currently used as a private recreational area for the benefit of LEC employees.

On January 12, 2010, LEC submitted an application requesting the required height exemption to install a 443-foot high, 2.5 MW wind turbine located at 22800 St. Clair Avenue to the City of Euclid Planning And Zoning Commission. The request for variance was approved on January 12, 2010 (See Attachment D-1j in Appendix D).

3.2.1.1 Direct and Indirect Impacts

Implementation of the proposed project would permanently commit 0.37 acre of previously disturbed and developed land. The turbine foundation will be surrounded by a 7-foot tall chain

link fence with a top 1 foot section with three barbed wires. The fence will be approximately 100-foot diameter (50-foot radius). The fencing will enclose an area of 7,853 square feet or 0.18 acre. The overall use of the general area is and will continue as industrial and manufacturing. The area immediately surrounding the proposed tower location will continue to be used as a private recreational area.

3.2.2 Biological Resources

The *Migratory Bird Treaty Act* (16 U.S.C. 703-7012; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importing migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. While MBTA has no provision for allowing unauthorized take, the USFWS recognizes that some migratory birds may be taken during activities such as wind turbine operation even if all reasonable measures to avoid a take have been implemented.

Bald and golden eagles are included under the MBTA, and are afforded additional legal protection under the *Bald and Golden Eagle Protection Act* (16 U.S.C. 668-668d). In its letter dated April 26, 2010, the USFWS indicated that no bald eagle nests exist within 5 miles of the turbine location and that the project area does not appear to support suitable bald eagle habitat (mature woods, ponds, streams); thus, bald eagles are not likely to regularly occur in the project area (See Attachment C-4 in Appendix C).

DOE requested natural heritage information, including the presence of any important biological resources for the project vicinity from the ONHP. This included information concerning known locations of rare, threatened or endangered species, rare vegetative communities, scenic rivers, and parks, preserves, and wildlife areas. The ONHP response indicates that none of these elements is known to be present in the project vicinity (See Attachment C1 in Appendix C).

LEC contacted ODOW for information concerning the project's potential impacts on wildlife species, especially bats and birds, including protected species of raptor (bald eagle, northern harrier, osprey, or peregrine falcon). ODOW stated that although the proposed turbine location is relatively close to the Lake Erie shoreline (approximately 2.2 miles north), it is within a highly developed region of the state that lacks suitable breeding or stopover habitat and there are no nests of protected species of raptor or observations of Indiana bat (state and Federal endangered species) within five miles of the site (See Attachment C-3 in Appendix C).

LEC and DOE contacted USFWS for information concerning rare, threatened and endangered species (See Attachment C-4 in Appendix C). USFWS responded that there are no Federal wilderness areas, wildlife refuges, or designated critical habitat within the vicinity of the project area. USFWS stated that the proposed project lies within the range of the Indiana bat (*Myotis sodalis*), a Federally listed endangered species. However, USFWS has no record for Indiana bats within 5 miles of the project and does not appear to support suitable habitat for the Indiana bat (hibernacula caves and/or maternity roosting habitat consisting of hardwood forested areas with dead snags used for roosting and nesting). The USFWS concluded that it does not anticipate any impacts to this species. The project area also lies within the range of the piping plover (*Charadrius melodus*), a Federally listed endangered species. The piping plover inhabits sandy

beaches, lakeshores and dunes. This preferred habitat (i.e., shorelines of the Great Lakes) does not occur within or immediately adjacent to the study area because the project lies approximately 2.2 miles from the Lake Erie shoreline. The USFWS concluded that it does not anticipate any impact on the piping plover or its habitat as a result of the proposed project.

3.2.2.2 Direct and Indirect Impacts

ODOW determined it is unlikely that this turbine will impact significant numbers of birds or bats (See Attachment C-3 in Appendix C). LEC has committed to the ODOW request that LEC conduct or arrange access for someone appointed by ODOW to conduct post-construction monitoring in accordance with the “*On-shore bird and bat pre- and post-construction monitoring protocol for commercial wind energy facilities in Ohio*” developed by ODOW (See Attachment C-3 in Appendix C).

During turbine siting, design and installation of the proposed wind project, LEC gave consideration to the guidelines contained within the USFWS *Interim Guidelines to Avoid and Minimize Wildlife Impacts* (2003). The following is a summary of the applicable recommendations and actions taken by LEC to comply with the guidelines:

- 1) Pre-development evaluations for wind farm sites by Federal and state wildlife professionals:
 - LEC contacted both the USFWS and the Ohio Department of Wildlife regarding the proposed project, and both agencies provided responses on potential effects to wildlife.
- 2) Rank site by risk to wildlife:
 - Based on telephone calls and written correspondence received from the ODOW and the USFWS (See Attachment C-3 and C-4 in Appendix C respectively) and the research conducted as part of the EA preparation for the proposed turbine location and its potential to provide habitat to bird, bat and other wildlife species, the proposed site is thought to be a low risk to wildlife.
- 3) Avoid placement of turbines in documented locations of Federally listed species:
 - No Federally listed species are documented in the area and the site does not provide habitat for any Federally listed species.
- 4) Avoid locating turbines in known flyways or migratory paths:
 - The proposed project is not located within a known migratory flyway or pathway, and the West Lake Erie Important Bird Area is approximately 1.5 miles north of the proposed turbine location (See website <http://www.ohiodnr.com/LinkClick.aspx?fileticket=YWCawZmeP%2bo%3d&tabid=2134>).
- 5) Avoid placement of turbines in bat habitat:
 - The project site is not considered to be suitable bat habitat.
- 6) Configuration of multiple turbines and managing stormwater to avoid attracting wildlife:
 - The proposed project is a single turbine, so the configurations of multiple turbines was not considered in the analysis or design. The project has included stormwater BMPs in the design and construction plans.

- 7) Avoid fragmentation of large tracts of habitat:
 - Although the Lake Erie shoreline is approximately 2 miles north, the project does not fragment large tracts of habitat.
- 8) Minimize roads, fences, and other infrastructure:
 - The proposed project will utilize existing roadways or developed areas for all construction and installation activities.
- 9) Develop a habitat restoration plan for the site that avoids or minimizes negative impacts on vulnerable wildlife:
 - There are no protected raptor nests within 5 miles of the project and the turbine installation site is on industrial land and surrounded by urban/suburban development; thus, a habitat restoration plan is not necessary.
- 10) Use tubular supports and avoid external lattice, ladders, platforms, etc., to minimize bird perching and nesting:
 - The turbine is a monopole design with no exterior lattice, ladders, guy wires or platforms.
- 11) Use minimum lighting required by FAA:
 - Minimum FAA light recommendations will be used in consideration of avian and bat species.
- 12) Adjust tower height if risk of strike is high:
 - The site is currently an industrial park and wildlife usage is very minimal. Because the site is considered to be low risk to wildlife, the proposed height is not believed to add to the overall risk of strikes to wildlife.
- 13) Place electric power lines underground:
 - All electric lines are to be placed underground.

Based on the foregoing, the proposed wind turbine is not anticipated to have a significant impact on avian species.

USFWS does not anticipate any direct or indirect impacts on the Indiana bat or other Federally listed species as a result of the proposed project (See Attachment C-4 in Appendix C). Therefore, DOE does not anticipate that the project would affect Federally protected threatened and endangered species or their critical habitat.

3.2.3 Noise

The Kenersys K100-2.5 MW is a tubular steel monopole, three-blade, ground-mounted wind turbine (the “K100”). It has a hub height of 85 meters (279 feet), a rotor diameter of 100 meters (328 feet), with an overall height of 135 meters (443 feet) to the blade tip. According to the specification sheet provided by the manufacturer, it has a Noise Power Level of 106 dBA (See Attachment D-2 in Appendix D (K100 Data Sheet)). LEC intends to install a single K100 wind turbine on an undeveloped portion of its property located near the southeast corner of St. Clair

Avenue and East 222nd Street (See Attachment D-3 in Appendix D (Site Improvement Plan)). The proposed wind turbine would be located in an area zoned U6 - Industrial and Manufacturing, as defined by Euclid, Ohio's Zoning Ordinance (the "Zoning Ordinance") (See Figure 8 in Appendix A (Euclid Zoning Map)).

Sound is a result of fluctuating air pressure. The standard unit for measuring sound pressure levels is the decibel (dB). A decibel (dB) is a unit that describes the amplitude (or difference between extremes) of sound, equal to 20 times the logarithm to the base 10 of the ratio of the measured pressure to the reference pressure, which is 20 micropascals (μPa). Typically, environmental and occupational sound pressure levels are measured in decibels on an A-weighted scale (dBA). The A-weighted scale de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear (i.e., using the A-weighting filter adjusts certain frequency ranges (those that humans detect poorly)) (Colby, *et al.*, 2009).

The U.S. Environmental Protection Agency (EPA) identifies noise levels necessary to protect public health and welfare against hearing loss, annoyance, and activity interference in its document, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," (April 2, 1974). These noise levels are in terms of "24-hour exposure" levels or an average of acoustic energy over periods of time, such as 8 hours or 24 hours, and over long periods of time, such as years. For example, occasional higher noise levels would be consistent with a 24-hour energy average of 70 decibels as long as a sufficient amount of relative quiet is experienced for the remaining period of time.

A 24-hour exposure level of 70 decibels is indicated by EPA as the level of environmental noise at which any measurable hearing loss over a lifetime may be prevented, and levels of 55 decibels outdoors and 45 decibels indoors as preventing activity interference and annoyance to human receptors. These levels of noise are those at which spoken conversation and other daily activities such as sleeping, working and recreation can readily occur.

Noise levels for various areas are also identified according to the use of the area. For example, 24-hour exposure levels of 45 decibels are associated with indoor residential areas, hospitals and schools, whereas 55 decibels is considered appropriate for preventing interference of human activities in certain outdoor areas. The level of 70 decibels is identified for all areas in order to prevent hearing loss.

It should be noted that in 1981, the Federal government concluded that noise issues were best handled at the state or local government level. As a result, the EPA phased out Federal oversight of noise issues to transfer the primary responsibility of regulating noise to state and local governments.

The existing noise environment for the wind turbine location in this heavy manufacturing area is characterized by local tractor trailer traffic, heavy interstate highway traffic, six rails of train traffic, numerous manufacturing facilities, and LEC's manufacturing facility that operates 24 hours a day, 7 days a week. The site is bounded to the north by a four-rail wide railroad CSX and an eight-lane divided I-90. To the south lies Norfolk Southern Railroad. The nearest residential zoning district "U1 - Single Family House District," per the Euclid Zoning Ordinance,

is located over 1,200 feet away from the proposed wind turbine location. This residential district is located on East 218th Street to the northwest of the proposed turbine location. Located between this residential district and the proposed turbine location is the aforementioned CSX railroad, I-90, and two, two-lane interstate marginal access roads, along with a 20-foot high interstate noise barrier wall. In addition, the average background noise level at East 218th Street (located along the marginal) is 67 dBA with an instantaneous level going to 80 dBA when a car drives down the marginal (See Attachment D-4 in Appendix D (Random Noise Survey, prepared by LEC)). Although the proposed turbine site is located within an industrially zoned area, there are two houses that have been converted to multi-family apartments across East 222nd Street approximately 330 feet west of the proposed turbine location.

LEC took three sound readings at each of the areas indicated in the Random Noise Survey during a span of approximately 12 hours in December 2009. The sound readings were recorded between approximately 8 a.m. and 9 a.m., 2 p.m. and 3 p.m., and 8 p.m. and 9 p.m. LEC averaged the readings at each location and noted that there were slightly less sound levels in the evening recordings. LEC used a Greenlee SML-200 Sound Level Meter with a windscreen over the end of the microphone. The unit was set for an A-weighted measurement (dBA). The large, bold dBA readings on the Random Noise Survey indicate the average of the three dBA recordings at a given location, while the smaller text within the box indicates specific occurrences of dBA readings recorded for the same given location (e.g., when a car or truck passed). This average dBA is attributable to the existing noise environment, which is characterized by LEC's manufacturing facility that operate 24 hours a day, 7 days a week, local tractor-trailer traffic, heavy Interstate highway traffic, six rails of train traffic, and numerous manufacturing facilities. As stated above, pursuant to the City of Euclid Zoning Code, the wind turbine site is zoned "U6 - Industrial and Manufacturing" district, but there are two rental apartments approximately 330 feet from the proposed turbine location. Based on the K100 Noise Power Level of 106 dBA, the resulting noise level would be approximately 55 dBA at these rental apartments (U.S. DOE Energy Efficiency & Renewable Energy website, citing Danish Wind Industry Association, Wind Turbine Sound Calculator, 2003). However, the existing background noise level along East 222nd Street, where these properties are located, also averages approximately 55 dBA (See Attachment D-4 in Appendix D).

The City of Euclid Zoning Code, at section 545.13, "Excessive Noise Defined," specifies a maximum decibel level of 70 dB at the property line of property zoned U6. The turbine tower base is 210 feet from the LEC west property line (along E 222nd Street) and 275 feet from the north property line (along St. Clair Avenue). Therefore, measuring from the shortest distance to the property line (210 feet), LEC is in compliance with a sound measurement of 59 dBA (Using USDOE EERE website, referencing Wind Turbine Sound Calculator, 2003, referenced above). (Note: The Euclid Zoning Code specifies dB, and not dBA; however, a measurement of 59 dBA would be considered in compliance based on typical measurement standards. See EPA press release dated April 2, 1974, referenced above, and Table 3-1 cited in Colby *et al.* (2009), referenced herein). As part of the wind turbine siting process, LEC has been working closely with Mr. Paul Beno, City of Euclid. Due to the press of business and time, Mr. Beno had not issued a letter of compliance, but stated that he would provide a letter stating so, if necessary. Mr. Beno has granted LEC permission to proceed with the wind turbine project based on a finding that there would be no visual impact issues. In fact, the City stated in its visual impacts approval letter, "These distances and the predominantly industrial nature of the area show that

this proposed turbine is well situated with regard to general land use planning principals” (See letter from Paul Beno, City of Euclid, to Seth Mason, LEC, dated March 8, 2010, as Attachment C-4a in Appendix C).

As previously stated, the K100 has a Noise Power Level of 106 dBA. The following table shows some sound pressure levels associated with common activities measured in dBA. For comparison, the sound from a wind turbine at distances between 1,000 and 2,000 feet is generally within 40 to 50 dBA (Colby, *et al.*, 2009, referenced herein).

Table 3-1. Typical Sound Pressure Levels Measured in the Environment and Industry.

Noise Source At a Given Distance	A-Weighted Sound Level in Decibels	Qualitative Description
Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1000 feet)	100	
Shout (0.5 feet)		
N.Y. subway station	90	Very annoying
Heavy truck (50 feet)		Hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet)	70 to 80	
Freeway traffic (50 feet)		
	70	Intrusive (Telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room	40	
Bedroom		
Library	30	Very quiet
Soft whisper (5 feet)		
Broadcasting/Recording studio	20	
	10	Just audible

Adapted from Table E, "Assessing and Mitigating Noise Impacts", NY DEC, February 2001.

Table 3-1 is cited in Colby *et al.* (2009), referenced above.

Noise would be temporarily emitted from the project site by construction equipment during the approximately five-month active construction period. However, due to the noise-generating activities from the existing industrial manufacturing facilities, traffic, etc., as described above, the wind turbine project construction noise would not be expected to significantly increase the

overall ambient noise emissions from the site, which ambient noise is shown at various locations on Attachment D-4 in Appendix D.

Sound decreases significantly with distance from the source. For example, sound pressure at 25 feet from a wind turbine hub drops by a factor of 4 at 50 feet, and by a factor of 16 at 100 feet. In the logarithmic scale of decibels, this equates to a drop of approximately 6 dBA for each doubling of the distance from point sound source. At a distance of approximately 350 meters (approximately 1,150 feet), sound from wind turbines is in the range of 35 to 45 dBA, similar to the background noise found in a typical home (Table 3-1, cited in Colby *et al.* (2009), referenced above; See also, AWEA, 2003).

Modern wind turbines have been designed to significantly reduce the noise of mechanical components, so the most audible noise is the sound of the wind interacting with the rotor blades, often resulting in what can be described as a “whooshing” sound. However, modern wind turbines are generally quiet in operation and this sound is anticipated to be less noticeable by humans when compared to sound from road traffic, trains, aircraft, and manufacturing activities for this industrial site.

3.2.3.1 Direct and Indirect Impacts

As previously stated, the K100 has a Noise Power Level of 106 dBA. At a distance of 330 feet, which is the location of the nearest residential rental properties on East 222nd Street, the resulting noise level would be approximately 55 dBA (U.S. DOE Energy Efficiency & Renewable Energy (USDOE EERE) website, citing Danish Wind Industry Association, Wind Turbine Sound Calculator, 2003). However, the existing background noise level along East 222nd Street, where these properties are located, averages approximately 55 dBA (See Attachment D-4 in Appendix D). Therefore, since existing background sound levels generally meet or exceed sounds that would be created by the proposed wind project, noise intrusion from the wind turbine is not expected to contribute to or exceed existing noise conditions at this residential location.

The nearest zoned residential neighborhood is approximately 1,200 feet away, across I-90 (which is blocked by a 20-foot high sound wall) and two major roadways. The combination of the fact that the nearest residential neighborhood is over 1,150 feet away from the wind turbine and the noise levels from I-90 and the major roadways that lie between the turbine and the neighborhood, impacts from noise intrusion from the wind turbine are not anticipated.

3.2.4 Visual Quality

The existing view of the project area is primarily industrial; with the extensive LEC facilities to the northeast through southeast (See Figure 4 in Appendix A). Active railroad tracks (CSX) lie about 660 feet to the north-northwest of the proposed turbine location and an eight-lane Interstate highway (I-90) lies about 230 feet beyond the tracks. Smaller industrial facilities occupy the area west and southwest of the proposed turbine. Another set of active railroad tracks (Norfolk Southern) lies about 1,460 feet southeast of the proposed turbine.

Four other vertical elements occur within 1.4 miles of the proposed turbine location (See Figures 9 and 10 in Appendix A). The two lowest (EP 3 water tower and EP1/2 water tower at 35 feet

and 128 feet high) and nearest features (at 562 and 2,565 feet away, respectively) occur on LEC property. The two highest (City of Euclid radio tower and Nottingham Water Plant radio tower at 299 feet and 350 feet high) are 6,003 and 5,198 feet away respectively. These latter two elements are more comparable to the proposed turbine due to their heights.

To address potential concerns about the aesthetic impacts of the proposed project, LEC commissioned a visual simulation of the proposed turbine from various viewpoints in Euclid and adjacent Cleveland (See Attachment B2 in Appendix B). These viewpoints ranged from less than 0.5 mile to over 1.6 miles from the proposed turbine site and completely surrounded the site. Photos were taken from these viewpoints and an image of a wind turbine was rendered into the photos at the proper scale and location.

Table 3-2 lists existing towers, shows their height, and identifies the approximate distance of each from the proposed Wind Turbine.

Table 3-2. Existing Towers Located in Euclid, Ohio.

Name	Type	Height in Feet	Distance – Feet	Distance – Miles
EP3	Water	35	562	0.106
EP ½	Water	128	2,565	0.486
Nottingham Water Plant	Radio	350	5,198	0.984
City of Euclid Tower	Radio	299	6,003	1.137

The visual character of these towers is illustrated in Attachment C-5f in Appendix C, which includes renderings of the towers showing comparative heights and oblique aerial photographs of the tower sites. Computer simulations depicting how the proposed wind turbine would appear in the view shed were prepared for public site locations around the project area (See Attachment C-5g in Appendix C and Table 3-3). The sites include parking lots of public and parochial schools, churches, a playground, fire station, exposition center, and a state park. Public sites were chosen because they are places where people gather and the introduction of a new element in their view shed would theoretically impact a greater number of people than private properties. Visual simulations at 13 locations were prepared, ranging from a distance of approximately 0.5 mile from the proposed site to almost 2 miles away, near the shore of Lake Erie.

The visual simulations show that the visual impact of the proposed Wind Turbine is not solely determined by distance. The visibility of the proposed Wind Turbine would vary by location due to the existing ridgelines, tree cover and various buildings and structures that would partially or entirely block the view. Unlike the open treeless prairies or deserts of the West, or flat agricultural areas of the Midwest where tall towers may be seen from several miles away, the natural vegetation of northeast Ohio includes many trees, occurring both naturally and as landscape plantings. These trees will effectively screen many potential views of the Wind Turbine. Where trees are lacking, in many cases buildings will potentially serve as visual obstacles to views of the Wind Turbine.

Table 3-3. Public Space Visual Simulation Study

Photo	Location	Distance	Direction	Visible	In APE	Wind Turbine viewshed partially obstructed by	Contains objects of similar height
1	Perry School	6967	West	Yes	No	Building	
2	Roosevelt School	4150	Northwest	No	Yes	Trees	
3	St. Christine's School	2545	North	Yes	Yes		Tree line
4	Euclid High School	4450	North	Yes	Yes		Parking lot lights poles
5	Great Lakes Expo Center	4650	Northeast	Yes	Yes		Parking lot lights poles, water tower
6	Tungsten Playground	6897	East-northeast	No	No	Trees	
7	St. Felicitas Church & School	7062	East	No	No	Trees and ridgeline	
8	Bethlehem Church	4866	East-southeast	No	Yes	Trees	
9	Glenbrook Elementary	4767	South-southeast	No	Yes	Ridgeline	
10	St. Joeseph Convent	6562	South	No	No	Trees and ridgeline	
11	Central Middle School	6805	South-southwest	No	No	Building	
12	Euclid Creek Park/ Fire Station	6526	West-southwest	No	No	Trees	
13	Wildwood State Park	9989	West	No	No	Trees	

One visual simulation taken from over one mile away indicates the Wind Turbine would be visible. Another visual simulation from a location that is less than 1 mile from the project site indicates that tree cover would mask the view of the wind turbine. Other visual simulations indicate that existing ridgelines in the area would mask the Wind Turbine. A visual simulation from a site approximately 0.75 mile (4,150 feet = .78 mile) from the project site indicates that the Wind Turbine could not be seen, while a site a little over 1.25 miles away (6,967 feet = 1.32 miles) indicates that the Wind Turbine would be visible.

In addition, an analysis was conducted to assess the view of the proposed wind tower from several locations using electronic USGS mapping as well as AutoCAD mapping with embedded aerial photographs. In this analysis, a line of site to the top of the tower (elevation 1,083 feet)

from a theoretical 6-foot tall viewer standing just outside each location was calculated. For a site at approximately 1 mile from the proposed tower and beyond, this resulted in angles of the sight line above horizontal of about 3 to 4 degrees, or in other terms, of percentages of slope of the sight line of between 8 and 11 percent (i.e., for every 100 feet of horizontal distance between the site and the tower, the sight line rises between 8 and 11 feet). With the relatively flat angles/slopes at these sites, it is apparent that nearby objects (trees, houses, and other buildings) would provide effective screening of one's view of the proposed wind tower.

The closer one approaches the proposed site, the more noticeable the proposed turbine will become. The nearest day-to-day viewers of the proposed turbine will be employees at the various surrounding businesses, including LEC. Users of I-90 will also have clear views of the proposed turbine.

Shadow Flicker

While it is not possible to quantify the visual impact of a wind energy project due to the subjective nature of aesthetics, visual impacts are sometimes a concern with such projects. Concerns about the visual impacts of wind energy projects generally revolve around aesthetic impacts and shadow flicker impacts associated with the rotating turbine blades. Shadow flicker is defined as alternating changes in light intensity caused by a moving object (such as a rotating rotor blade) casting shadows on another object. Shadow flicker from wind turbines can occur when moving turbine blades pass in front of the sun, creating alternating changes in light intensity or shadows. These flickering shadows can cause an annoyance when cast on nearby residences ("receptors"). The spatial relationship between a wind turbine and a receptor, the location of trees, buildings, and other obstacles, and weather characteristics such as wind speed/direction and sunshine probability, are key factors related to shadow-flicker impacts. Shadow flicker becomes much less noticeable at distances beyond about 1,000 feet except at sunrise and sunset when shadows are long (Appendix D-5 in Appendix D).

LEC commissioned a study to determine if any nearby occupied dwellings would be adversely affected by shadow flicker from the project. Appendix D includes the shadow flicker analysis (Attachment D-5 in Appendix D). The results from the shadow flicker study indicate that a relatively small number of receptors receive more than 30 hours of shadow flicker per year. These receptors are all located south of I-90. Four receptors are within the 100 hours isoline, 12 receptors are within the 50 hours isoline, and 17 receptors are within the 30 hours isoline. These results are provided below in Table 3-4 and Figures 18 and 19 of Attachment D-5 in Appendix D.

The principal method of mitigation available for shadow flicker effects is to close down the wind turbine at times when the turbine has been predicted or demonstrated to cause shadow flicker effects. A system is available that uses a device to measure the intensity of sunlight occurring at a particular moment, together with the date and time, location of the wind turbine and locations of nearby houses, to calculate whether shadow flicker will occur.

Table 3-4: Shadow Flicker Analysis Results

Receptor	Max shadow hours per day	Max shadow hours per year
N2	2:47	157:05:00
N1	2:48	154:12:00
N37	2:29	135:33:00
N40	2:31	126:08:00
N36	2:15	93:02:00
N39	2:26	88:10:00
N42	2:14	78:59:00
N41	1:51	77:28:00
N35	1:41	76:23:00
N34	1:28	66:38:00
N33	1:19	56:37:00
N130	1:14	51:14:00
P1	2:08	48:18:00
N130	1:08	42:52:00
N32	1:08	34:51:00
P2	1:49	33:02:00
P3	1:19	31:32:00

3.2.4.1 Direct and Indirect Impacts

The Proposed Action would affect the viewshed in the project area. The turbine would be a dominant vertical component in the landscape due to its height, but it would not obstruct views in the way that a large building might. Since it is placed in a landscape with other vertical elements (e.g., other towers, discussed above), the visual impact of the turbine is minimized. Installation of the turbine on a landscape that already has vertical features has less of an impact than placing it on a flat landscape with no other vertical development.

In general, there are no anticipated visual impacts that would significantly adversely affect nearby residents, users of the project area and surrounding areas, or passersby as a result of the development of this project.

LEC proposes to install shadow control equipment for the Kenersys turbine. This equipment would have the ability to decrease shadowing to a certain threshold by curtailing turbine operation. Of the 17 receptors exceeding 30 hours shadowing per year, 3 were “P” participating (LEC owned) and 14 receptors were “N” non-participating that may require mitigation action. If shadow impacts become a legitimate annoyance for the receptor(s), LEC would assist those receptors to purchase blinds for windows and/or screening trees.

There is some concern in the public that shadow flicker from wind turbines can cause epileptic seizures. Shadow flicker from wind turbines occurs much more slowly than the light “strobing” associated with seizures. The strobe rates necessary to cause seizures in people with

photosensitive epilepsy are 3 to 5 flashes per second, and large wind turbine blades are not engineered to rotate at such a high rate [American Wind Energy Association (AWEA), 2009].

3.2.5 Transportation

The project site as well as the entire LEC manufacturing campus is served by the local roads of East 222nd Street and St. Clair Avenue. Access to interstate transportation system is available at the I-90/East 222nd Street/Lakeland Boulevard just northwest of the proposed turbine location. No new access or other roads are necessary for construction and operation of the wind turbine at the proposed location.

Construction equipment will travel to the project site via I-90, Euclid Avenue (Exit 186), Chardon Road, E 200th Street and Saint Clair Avenue. Access from St. Clair Avenue to the construction site is via the existing access driveway at 22800 Saint Clair Avenue (EP3 Facility – Distribution Center – building directly east of the project site).

3.2.5.1 Direct and Indirect Impacts

During the heavy construction phase of the project, which is anticipated to last approximately four months, a temporary increase in vehicular traffic on the local roads identified above surrounding the project site is anticipated. No long-term or permanent impacts to the local transportation systems would occur as a result of this project.

Large pieces of equipment such as the turbine tower, rotor blade, and nacelle would be designated oversized loads and would temporarily slow traffic on the I-90 freeway and East 222nd Street and St. Clair Avenue. Local traffic impacts would be from the Port of Cleveland to the LEC site along I-90 / OH Rt 2. However, these would be short-term impacts only. Estimated time from the Port of Cleveland to LEC is 30 minutes.

3.2.6 Groundwater and Surface Water Resources

Based on the review of existing OEPA/ODNR groundwater resource maps, the proposed project area is not located in an endorsed well head protection area, where certain activities are restricted within an OEPA-designated protection area. Additionally, the proposed project area is not located within any designated Public Water System supply areas (sole source aquifer, community/non community systems, drinking water source protection areas using groundwater/surface water). Groundwater is generally not a source of drinking water in this part of Cuyahoga County. There are no private well-water supplies on or near the project site. The *Groundwater Resources of Cuyahoga County* (Crowell, 1979) indicate that this portion of Cuyahoga County is a very poor groundwater source and would yield less than three gallons of water per minute due to “impermeable deposits, basically clay overlaying shale or shaley sandstone, (that) provide a very poor area for even minimal domestic supplies.”

In compliance with the Clean Water Act, the project site was investigated for surface water. No ponds, streams, or wetlands occur in the project vicinity or would be impacted by the project (See Figure 5 in Appendix A for the project-area NWI Map). The nearest surface water body is a wet retention basin on LEC property approximately 800 feet southeast of the proposed wind

turbine location. A dry retention basin occurs just south of the softball field, approximately 435 feet south of the proposed wind turbine location. The nearest stream is Euclid Creek, at 1.14 miles to the southwest, which flows into Lake Erie.

3.2.6.1 Direct and Indirect Impacts

The proposed project would have no adverse affect on any groundwater resources. No runoff or discharges from the proposed project construction area would directly enter Euclid Creek. Since ground-disturbing activity will be less than one acre, an NPDES permit would not be acquired prior to any construction-related earthwork. However, LEC has committed to using sediment and erosion pollution control BMPs in conformance with a plan specific to this project. A third-party engineering firm would provide the Stormwater Pollution Prevention Plan that is in accordance with the ODNR's Rainwater and Land Development Manual (2006). On-site construction personnel will perform weekly inspections of the erosion and sediment control structures and the third party engineering firm would be retained to perform monthly inspections.

3.2.7 Soils

The only soil mapped as occurring at the project site and the surrounding vicinity is Urban land [marked as Ub on Figure 11 in Appendix A, the project-area soil map (Natural Resources Conservation Service, 2010)]. Urban land is described as “areas where more than 80 percent of the surface is covered by asphalt, concrete, buildings, or other manmade surfaces” (Soil Conservation Service, 1980).

3.2.7.1 Direct and Indirect Impacts

Site preparation and project construction would result in soil disturbance. As part of project construction, approximately 0.37 acre of current open space in LEC’s private recreational area would be disturbed. Since ground-disturbing activity will be less than one acre, an NPDES Stormwater Program Permit will not be required. However, LEC has committed to using sediment and erosion pollution control BMPs in conformance with a plan specific to this project. A third-party engineering firm would provide the Stormwater Pollution Prevention Plan that is in accordance with the ODNR's Rainwater and Land Development Manual (2006). On-site construction personnel will perform weekly inspections of the erosion and sediment control structures and the third party engineering firm would be retained to perform monthly inspections.

3.2.8 Air Quality and Climate Change

The affected air environment can be characterized in terms of concentrations of the criteria pollutants carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter (PM), nitrogen dioxide (NO₂), ozone (O₃) and lead (Pb). The EPA has established National Ambient Air Quality Affected Environment and Environmental Impacts Standards for these pollutants. There are two standards for particulate matter, one for particulates with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM₁₀) and one for particulates with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers (PM_{2.5}). According to the Northeast Ohio Areawide Coordinating Agency [NOACA (2010)], Cuyahoga County, Ohio, is in non-

attainment for only PM_{2.5}. Cuyahoga County is in attainment for CO, SO₂, PM₁₀, NO₂, O₃, and Pb.

The EPA has found that the “aggregate group of the well-mixed greenhouse gases” constitutes an air pollutant that contributes to climate change. CO₂ is a greenhouse gas and the LEC wind turbine would have an indirect impact on CO₂ emissions from fossil fuel sources.

3.2.8.1 Direct and Indirect Impacts

The proposed wind energy project at LEC would be an emissions-free energy generation project that would not degrade air quality. Aside from temporary dust generated during construction and decommissioning, which would be minimized to the extent practicable (for example, by watering dry roads), this project would not result in any adverse impacts to air quality. The project would not require any air permits.

As explained further in Section 4.2, CO₂ is a greenhouse gas that contributes to climate change, which in turn causes harm to many physical and biological systems. The proposed project would reduce LEC’s carbon footprint by reducing reliance on fossil fuels.

The proposed wind energy project is expected to generate approximately 6,451,000 kilowatt-hours per year, and if the wind energy project is built, approximately 10 percent of electricity used by LEC would be supplied by the project rather than by the current utility, First Energy Solutions. In 2009, the utility generated about 60 percent of its total electricity with fossil fuels, and the remaining 40 percent of electricity generation came from sources that do not directly emit carbon dioxide (renewables and nuclear) (First Energy, 2005; USDOE EIA, 2010). The project’s carbon reduction is calculated as follows:

$$\begin{aligned} &59.9\% \text{ coal} \times 2.0562 \text{ lb of CO}_2/\text{kilowatt-hour} \times 6,451,000 \text{ kilowatt-hour/year} = \\ &7,945,463 \text{ lbs of CO}_2/\text{year or } 3,972 \text{ short tons of CO}_2/\text{year or } 3,604 \text{ metric tons of} \\ &\text{CO}_2/\text{year or } 3,547 \text{ long tons CO}_2/\text{year.} \end{aligned}$$

Thus, under the proposed action, the wind turbine would reduce LEC’s carbon footprint. Under the No-Action Alternative, LEC would not reduce its carbon footprint and the status quo would prevail..

3.2.9 Socioeconomics and Environmental Justice

Executive Order 12898 (February 11, 1994) directs Federal agencies to identify and address “disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” The racial makeup of the City of Euclid in 2000 was 66.8 percent white with the remainder as minorities, compared to 67.4 for Cuyahoga County as a whole. The median household income in 1999 dollars for a household in the City of Euclid in 2000 was \$35,151, compared to \$29,168 for the Cuyahoga County as a whole. About 7.1 percent of families and 9.1 percent of individuals were below the poverty level in 2000. This contrasts to comparable figures of 10.3 percent and 13.1 percent for Cuyahoga County as a whole (U.S. Census Bureau).

While its manufacturing plants and offices span the globe, LEC's worldwide headquarters and largest manufacturing facilities reside in Northeast Ohio. The Euclid, Ohio main campus and Mentor, Ohio operations consist of more than 200 acres where present manufacturing facilities command an area of approximately 2,940,000 square feet.

Within its main campus in Euclid, LEC maintains its R&D activities, its senior management offices, its largest manufacturing facility as well as a newly created customer service and distribution center. During the past three years, the campus has been expanded to include a state-of-the-art Machine Robotics Center. This Center has received both No Further Action (NFA) and Covenant Not to Sue (CNS) environmental status from the State of Ohio as part of LEC's acquisition and environmental clean up of an idling neighboring plant.

LEC currently employs approximately 2,200 associates in Euclid and more than 300 associates in Mentor. LEC's Ohio workforce has 23% minority employment and 13% female employment. The company and its employees remit tens of millions of dollars annually in state and local taxes.

3.2.9.1 Direct and Indirect Impacts

The proposed wind project would be located within an industrial/manufacturing area and over 1,200 feet from the nearest residential-zoned area to the northwest. No potential high and adverse impacts to human health or environmental effects have been identified in this EA. Therefore, there would be no disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

3.2.10 Energy Impacts

The proposed wind energy project would have a nameplate capacity of 2.5 megawatts and generate approximately 6,451,000 kilowatt-hours per year, or enough electricity to supply up to 686 homes each year. The wind energy generated from the proposed project would meet approximately 10 percent of LEC's Euclid operations annual electricity needs. If the project did not move forward, it is assumed that the electricity used by LEC at this location would continue to be supplied primarily by fossil-fuel sources, which are finite. The proposed renewable energy project is anticipated to produce a total of 129,020,000 kilowatt-hours of clean electricity for the 20-year design life of the project.

3.2.10.1 Direct and Indirect Impacts

No adverse energy impacts would result from the project. The positive energy impact of the implementation of this project is that approximately 10 percent of electricity used by LEC would be supplied by the project and not by First Energy Solutions. As discussed above, this would reduce carbon emissions by 3,972 short tons of CO₂/year and allow Lincoln Electric to meet its objective to reduce its carbon footprint.

3.2.11 Cultural Resources

DOE conducted a search to identify cultural resources that the proposed wind turbine might affect. As explained in the following subsections, the only potential impacts from the wind

turbine on cultural resources would be noise and visual impacts. DOE finds that noise intrusion from the wind turbine would be inconsequential at historic properties because noise levels from the operation of the turbine would be equal to or less than background sound levels. With respect to visual impacts, parts of the wind turbine would at times be visible from certain historic properties, but the wind turbine would not significantly alter the view from these properties and shadow flicker is not anticipated to affect any of the properties. As a result, both ODOD and DOE found that construction and installation of the proposed wind turbine would have no adverse effect on the character-defining features of any historic properties. Despite this conclusion, DOE sets forth below considerable detail about the historic properties and information demonstrating the limited visibility of the wind turbine from historic properties.

3.2.11.1 Consulting Party Participation

According to “Indian Entities Recognized and Eligible to Receive Services” from the U.S. Bureau of Indian Affairs in 72 FR 13648 dated March 22, 2007, there are no Federally recognized Tribes in the State of Ohio.

There is no Tribal Historic Preservation Officer for the State of Ohio according to the National Association of Tribal Historic Preservation Officers at <http://www.nathpo.org>. However, DOE has provided the Notice of Availability to 22 tribal representatives that are regularly notified of Federal actions in Cuyahoga County¹. DOE entered into consultation with the Ohio Historic Preservation Office (OHPO) pursuant to Section 106 of the National Historic Preservation Act (NHPA) and its implementing regulations 36 CFR Part 800 “Protection of Historic Properties (Section 106)” for the construction of the proposed project. DOE provided information to OHPO concerning the following:

- Consulting party participation beyond agencies—who they are and what their opinions are;
- Justification for the Area of Potential Effect (APE);
- Identification and evaluation of properties not previously identified—that is, not already listed in the NRHP or inventories, and;
- Assessment of effects to any historic properties (including those newly identified) in the APE.

OHPO was informed that consultation with interested parties regarding the potential effects of the project on National Register of Historic Properties (NRHP) listed or eligible properties would take place within the NEPA process discussed above in Section 1.5. Public notification and Section 106 consultation was coordinated as part of this EA. Documentation of DOE Section 106 consultation with OHPO is included in the EA and in Attachment C-5 in the Appendix.

The following agencies and organizations received the Draft EA and cover letter specifically as part of the Section 106 consultation process:

- City of Euclid
- City of Euclid Historic Landmarks Commission
- Euclid Historic Museum and Euclid Historical Society

¹ List used by the U.S. Army Corps of Engineers Buffalo District for their actions occurring in Cuyahoga County.

- Cleveland Restoration Society
- Urban Design Center of Northeast Ohio
- Cuyahoga County Government
- Cuyahoga County Planning Commission
- First Suburbs Development Council
- Western Reserve Historical Society
- Western Reserve Heritage Association

3.2.11.2 Above-Ground and Archaeological APEs

The archaeological APE for the LEC Wind Turbine project is defined as the 10-acre proposed construction site (Attachment C-5c in Appendix C). The Above-Ground APE for the project is defined as a 1-mile radius from the proposed Wind Turbine location (Attachment C-5d in Appendix C).

Clarification of Archaeological APE

The APE determined for archaeological resources focuses on the zone of direct ground disturbance associated with the construction of the Wind Turbine. Although the installation of the wind turbine will be limited to approximately 0.37 acre, which includes the foundation of the Wind Turbine and clearing around the foundation, the construction site is considered to potentially include the entire 10-acre area. The archaeological APE therefore is considered to be the 10-acre construction site. Current construction plans can be found in Attachment C-5e in Appendix C. The Wind Turbine foundation will be approximately 12 feet below the ground surface (after the removal of the artificial fill).

Clarification of Above-Ground APE

In defining the above-ground APE, both direct and indirect effects were considered. Direct, physical effects would only occur at the construction sites itself; that site is included in the APE. It was determined that that the visual character and the setting of the surrounding area should be considered, especially the presence of existing industrial towers in the view shed, in order to assess the potential indirect, visual effects of the Federal Undertaking. A computer-generated visual simulation of the view shed of the proposed Wind Turbine as it would be viewed from public spaces was analyzed to determine an appropriate APE.

The southeast intersection of East 222nd Street and St. Clair Avenue is located in an area zoned by the City of Euclid as U6 – Industrial and Manufacturing District. Delineation of this industrial district set a national precedent when a landmark Supreme Court decision (*Village of Euclid v. Amber Realty*, 272 U.S. 365 (1926)) upheld the constitutionality of municipal land use zoning. This decision prevented Amber Realty from developing an industrial use south of Euclid Avenue, which continues to define a southern boundary for Euclid’s industrial district. Along the northern boundary of this industrial area (Interstate 90 and CSX freight line railroad tracks) 20-foot high concrete slab noise barrier walls are located on both sides of I-90. The south noise barrier wall is visible from the project area. The N&S Railroad, also a freight line, runs through the district and is north of Euclid Avenue.

South of Euclid Avenue the former shoreline of ancient Lake Whittlesey, dating from the retreat of the glaciers that formed the Great Lakes, is currently characterized by steep slopes that rise

several hundred feet in elevation and are heavily wooded. The Euclid Creek runs southeast to northwest from the steep slopes south of Euclid Avenue to Wildwood State Park, located on the shores of Lake Erie. The ancient lake shores and this tributary form numerous ridges in the area.

As previously discussed in Section 3.2.4.1 (Visual Quality) of this EA, visual simulations were performed in order to assess impacts on the visual character of the community and the region's associated landscape from various public space vantage points.

This visual simulation indicates the distances from which the proposed Wind Turbine could be seen range from 2,545 to 6,967 feet. Simulation sight line distances from which the proposed Wind Turbine is not visible range from 6,526 feet to 9,989. The mean distance of the locations from which the Wind Turbine could be seen is 4,238 feet. The mean distance of the locations from which the Wind Turbine could not be seen is 7,258 feet. The average of the two means is 5,748. The mean distance of the computer generated visual simulation viewing sites is 5,864 feet. A mile above-ground APE would be 5,280 feet from the proposed Wind Turbine.

Beyond one mile, the angles/slopes of any sight lines diminish, decreasing the chances of unobstructed views of the Wind Turbine. For example, the NRHP listed Albert J. Henn Mansion that is 11,243 feet (2.1 miles) away from the Wind Turbine site was calculated to have an angle of sight line above horizontal of approximately 2 degrees, which equates to a slope of 4.3 percent. The effect of this flat slope is that 40-foot tall trees occurring within 800 feet of the mansion would screen the view of the Wind Turbine. Given the frequency of urban and street trees within the City of Euclid, it is highly unlikely that a treeless 800-foot stretch would occur that would visually affect many properties.

In summary, the likelihood of a clear, unobstructed vista of the Wind Turbine beyond one mile is extremely small and diminishes rapidly as one travels further away from the site. The varied topography which includes ridgelines, structures consistent with a dense, urban industrial area including tall towers, and the extensive tree canopy found throughout the city, create frequent visual obstacles that block expansive views in the area. A one-mile APE is justified for determining the effects, including visual effects, of the proposed Wind Turbine as it represents a reasonable effort to assess visual effects of the project based on available technology and the existing physical character of the area.

3.2.11.3 Identification of Historic Above-Ground Properties in APE

In correspondence to OHPO dated May 14, 2010, DOE provided information about previously-identified historic properties within the APE. Those properties included NRHP-listed properties in Euclid (2 properties), properties listed in the Ohio Historic Inventory (10 properties) within the APE, and properties within the APE identified by the current City of Euclid Certified Local Government-funded Historic Property Reconnaissance Survey (CLG Survey; 3 properties).

As part of the Section 106 Consultation with OHPO, historic property research was conducted, and included a site inspection of the OHI properties within the APE and evaluation of their eligibility for the NRHP. This information was also utilized to evaluate those properties for NRHP eligibility evaluation.

Ninety properties have been identified by the CLG Survey that will be recommended for further evaluation to determine whether or not they are historic properties eligible for listing in the NRHP. Thirty of these properties are located within the APE for this project. Of these 30, 10 are the previously identified Ohio Historic Inventory (OHI) properties noted above. The results of this identification and evaluation have determined that a total of 5 properties located within the APE are eligible for listing in the NRHP. The following sections describe the CLG Survey methodology and assess the NRHP eligibility of the OHI and CLG Survey properties within the APE. Details of the CLG Survey methodology and detailed findings are located in Attachment C5h in Appendix C.

3.2.11.4 OHI Properties: NRHP Eligibility Assessment

Resources recorded by the OHI with individual OHI forms included ten properties within the APE (Table 3-5). Field and desktop investigation were undertaken to confirm that all ten properties recorded in the OHI forms remained extant. These tasks were performed using photographs taken during a May 2010 field survey and the specific OHI forms, which include “Site Plan with North Arrow,” and a map to identify the location of each property. This further verification of extant properties was based on the most up-to-date information and imagery provide by *Google Earth Professional* computer software, which provides GIS-based aerial and street view imagery updated in May 2007.

Table 3-5. OHI Properties Within APE (See Attachment C-5d-2 in Appendix C)

OHI Number	Resource Name	Address
OHI No. CUY-1645-22	Euclid City Hall	585 East 222nd Street
OHI No. CUY-1658-22	North Street School	21129 North Street
OHI No. CUY-1643-22	North Street Elementary School	21103, 21105 North Street
OHI No. CUY-1654-22	Roosevelt School (Noble School)	1551 East 200th Street
OHI No. CUY-1659-22	Nottingham Purification Plant	1300 Chardon Road
OHI No. CUY-1644-22	Ajax Manufacturing Company	1441 Chardon Road
OHI No. CUY-1650-22	A.A. Aiken; George W. Woodworth; C.S. Tracy, House	Euclid Ave. at TRW Drive
OHI No. CUY-1657-22	F. L. Priday Residence	1530 212th Street
OHI No. CUY-1652-22	L. Priday Residence	678 East 222nd Street
OHI No. CUY-1651-22	N/A (Present Name on OHI: 1731 Beverly Hills Drive)	1731 Beverly Hills Drive

Two of the ten properties were found to be no longer extant -- OHI No. CUY-1657-22 and OHI No. CUY-1650-22. A small 1970s multi-unit residential building now occupies the former location of OHI No. CUY-1657-22. A large multi-unit residential building now occupies the former location of OHI No. CUY-1650-22 (the Aiken, Woodworth, Tracy House). OHI No. CUY-1650-22's status was further confirmed by a June 4, 2010 telephone interview with John Williams, President of the Euclid Historical Museum. Investigation suggests a section of the original premises has been developed as an apartment complex and there are no buildings present in the location of the building recorded on OHI No. CUY-1650-22.

The remaining eight OHI properties were evaluated using the original OHI forms and photographs taken during field survey to determine their eligibility for listing in the NRHP through the application of the NRHP Criteria for Evaluation Attachment C-5i in Appendix C. Both the historic context and the period of significance used to conduct this evaluation were drawn from the CLG Survey Report. While all Criteria of the NRHP were considered, given the limits of the information obtained through the methods described above, evaluation was weighted towards Criterion C as that criterion is primarily based upon physical attributes that may be observed through exterior photographs. The eight OHI properties also underwent NRHP evaluation as contributing properties in a historic district and none of the properties found NRHP eligible in this investigation appear to be in a historic district nor is a potential historic district known to be within the APE.

Following is a summary of the findings of each of the above-referenced properties. Complete details regarding the analysis and eligibility as well as the methodology used in the evaluation of each of the properties are located in Attachment C-5h in Appendix C.

OHI No. CUY-1643-22 is a one-and-a-half-story red brick building located at 21103-05 North Street, which according to the OHI form, was constructed in 1870 as a school and is present on an 1874 atlas. The DOE has determined that OHI No. CUY-1643-22 is not eligible for listing in the NRHP.

OHI No. CUY-1644-22 is two-story red brick industrial building located at 1441 Chardon Road. According to the OHI form, the building was constructed in 1924 for the Ajax Manufacturing Company—a Cleveland-based producer of nuts, bolts, and machinery. The DOE has determined that OHI No. CUY-1644-22 is not eligible for listing in the NRHP.

OHI No. CUY-1651-22 is a substantial three-story detached single-family dwelling located at 1731 Beverly Hills Drive. According to the OHI form the building was constructed in 1925 and is Tudor Eclectic in style. The history of residency is not provided. The DOE has determined that OHI No. CUY-1651-22 is not eligible for listing in the NRHP.

OHI No. CUY-1652-22 is a two-story, wood-frame vernacular late Victorian-era single-family detached residential building located at 768 East 222nd Street. According to the OHI form the building was constructed in 1890 and, as of 1914, the dwelling was situated on 38 acres owned by J. Priday. The Priday family owned other land in Euclid. The DOE has determined that OHI No. CUY-1652-22 is not eligible for listing in the NRHP.

OHI No. CUY-1654-22 is a substantial one-story brick school building located at 1551 East 200th Street. According to the OHI form, the building was completed in 1919 with eight classrooms as the Roosevelt School. It has since been enlarged and is now twice its original size and 27 classrooms. Because the building maintains physical integrity sufficient for listing in the NRHP, the DOE has determined that OHI No. CUY-1654-22 is eligible for listing in the NRHP.

OHI No. CUY-1658-22 is a one-and-a-half-story red brick building located at 21129 North Street. According to the OHI form, the building was constructed as a public school in 1894 and is purported to be one of the oldest public buildings in Euclid. Because the building maintains

physical integrity sufficient for listing in the NRHP, the DOE has determined that OHI No. CUY-1658-22 is eligible for listing in the NRHP.

OHI No. CUY-1659-22 is a large-scale yellow brick industrial building located at 1300 Chardon Road. According to the OHI form, the WPA initiated plans for construction of the plant in the 1930s, but it was not completed until 1951. The building was designed by Havens & Emerson—an Ohio-based architectural-engineering firm. Because the building maintains physical integrity sufficient for listing in the NRHP, the DOE has determined that OHI No. CUY-1659-22 is eligible for listing in the NRHP.

3.2.11.5 CLG Survey Properties: NRHP Eligibility Assessment Methodology

The CLG Survey identified 90 properties in the City of Euclid that will be recommended for further evaluation to determine whether or not they are historic properties eligible for listing in the NRHP. Thirty of these properties are located within the APE for this project. URS evaluated these thirty properties to determine whether or not they are historic properties eligible for listing in the NRHP through the use of images of the buildings found on *Google Earth Professional*, supported by analysis by team members with knowledge of the history and architectural history of northeast Ohio. On-site survey of these properties has not been completed.

Table 3-6 identifies the properties in the APE recommended for additional survey by the CLG draft survey report. The last column of this table is DOE’s assessment of the property’s NRHP eligibility.

**Table 3-6. CLG Survey
Proposed List of Properties to Survey in APE**

Building Type	Resource Name	Address	NRHP Eligible
Public Building	Fire Station #9	Euclid at E. 221st Street	No
Church	St. Christine Church/School	East 222nd Street	No
Church	St. Paul Church/School	1231 Chardon Road & E. 200th	No
Church	Our Lady of Lourdes Shrine	across from 21351 Euclid	No
Commercial Building	Guy's Pizza	861 East 222nd Street	No
Commercial Building	Paddy's	920-928 East 222nd Street	Yes
Commercial Building	Corner Beverage	923 East 222nd Street	Yes
Commercial Building	DiDonato Funeral Home (formerly Brickman Funeral Home)	21900 Euclid Avenue	No
Industrial Building	Chandler Products	1491 Chardon Road	No
Industrial Building	Sunshine Products	1111 East 200th Street	No
Industrial Building	Glasscote Products	20900 St. Clair	No

**Table 3-6. CLG Survey
Proposed List of Properties to Survey in APE**

Building Type	Resource Name	Address	NRHP Eligible
Industrial Building	TAPCO	23000 Euclid (23555 Euclid Ave.)	No
Industrial Building	Powdermet, Inc. formerly Textron Airfoil Forgings	24112 Rockwell Drive	No
Residential Building	20th c. residential	23970 Effingham	No
Residential Building	20th c. residential	800 block E. 212th	No
Residential Building	A Sear's House	20701 Naumann	No
Other	Paul Serra Stadium Concession	585 E. 222 St	No
Other	Slovenian Society Home	20713 Recher	No

3.2.11.6 CLG Survey Properties: NRHP Eligibility Assessment

Of the 30 CLG properties located within the APE, 18 were recommended for further analysis and of the 18, only two were determined to be NRHP eligible and are discussed below. Details related to the analysis and evaluation of the other buildings listed in Table 3-6 are located in Attachment C-5h in Appendix C.

The commercial buildings identified as **Paddy's** and **Corner Beverage** (920-928 and 923 East 222nd Street) appear to have high integrity (Attachment C-5j in Appendix C). Common architectural elements include yellow tapestry brick facades, stone lintels and sills, and stone-capped parapets with raised central bay and corner piers. **Paddy's** is actually two connected buildings. The corner building is two stories in height and features a cut-away corner entrance, transom windows, a box oriel side bay, central bay second floor entry capped by a small segmental arch canopy, brick frieze paneling, and recessed second floor window spandrels articulated by corbelling. The smaller attached building has a recessed entry flanked by display windows with transoms. One of the display windows appears to be filled-in and the building's lack of detail suggests a possible 1940s or 1950s construction date.

Corner Beverage, which is located across the street from Paddy's, features a hip roof facade-length canopy covered with curved ceramic roofing tiles. Below this roof/ canopy feature the facade is separated by a pier into two storefronts. One storefront consists of a recessed entry flanked by display windows and the other smaller storefront is an end recessed entry and one adjacent display window. The original display and transom window fenestration pattern appears intact. Piers of the facade have vertical panel outlines appearing to consist of darker header bricks.

NRHP Evaluation

These buildings are considered eligible for NRHP listing as strong representatives of a commercial architecture associated with the streetcar suburban expansion and Euclid's early 20th century development. The CLG Survey Report does not identify them as a historic district.

3.2.11.7 Summary of NRHP Eligibility Findings

Six properties in the Undertaking's APE have been identified as being eligible for listing in the NRHP. Those properties are:

1. Nottingham Purification Plant
2. Euclid City Hall
3. North Street School
4. Roosevelt School
5. Paddy's
6. Corner Beverage

Four of these properties (Nottingham Purification Plant; Euclid City Hall; North Street School, Roosevelt School) were among the previously identified as OHI properties. Two of these properties (Paddy's; Corner Beverage) were identified by the CLG Survey.

3.2.11.8 Direct and Indirect Impacts

Assessing the potential effects of the proposed project on historic properties in the APE included consideration of whether or not historic properties may be directly or indirectly affected by visual, audible, or atmospheric intrusions, shadow effects, vibrations from construction activities, or a change in access or use as a result of changes to the property. The project is located in a dense urban environment whose character will not likely be changed by the project, and there will be no demolition or physical changes to any historic property's appearance or form. Therefore, using criteria consistent with other wind turbine analyses for determining effects, the analysis of impacts to historic resources primarily focused on visual and sound effects.

To be considered adverse, an undertaking's effects must change the character-defining features or elements of a historic property needed to convey its historic association. Of primary concern for this project are NRHP-eligible properties defined in part by features that emphasize each property's historic setting as a way of conveying its historic significance. Because integrity of feeling and association often round out the character of a property's historic setting, a historic property that conveys a sense of time and place is often regarded as possessing significant physical as well as intangible qualities. In order to better understand if the setting of historic properties in the APE might be adversely affected by the project, the results of a noise impact analysis and various visual effect studies were analyzed.

Potential indirect, visual effects of the wind turbine on NRHP-eligible properties have been determined, in part, by the ability of a person to see the proposed tower from the historic property. To aid in this analysis, photographs were taken from the sites toward the proposed tower location. Additional evaluation materials were prepared with which to better understand the potential visual effects of the project by the use of digital mapping and embedded aerial photographs. Lastly, a flicker effect study was carried out for the proposed project.

Noise Impacts Analysis

Potential adverse impacts resulting from noise were analyzed and discounted in Section 3.2.3.1, above. This analysis found that as close as 330 feet from the wind turbine (the nearest residential

location), the resulting noise level would be approximately 55 dB(A). However, the background noise level along East 222nd Street ranges from 55 dB to 78 dB when traffic passes along East 222nd. Therefore, since existing background sound levels exceed sounds that would be created by the proposed wind project, noise intrusion from the wind turbine should be inconsequential in total noise emissions at this residential location. All of the historic properties discussed above are well beyond 330 feet from the wind turbine, thus noise intrusion from the wind turbine should be inconsequential in total noise emissions at any of the historic properties.

Photographic Views from NRHP-eligible Properties to Project Site

The ability of a person to see the wind turbine from NRHP-eligible properties is directly relevant to whether or not there may be the potential for an adverse effect from the proposed Wind Turbine. Photographs taken from the physical location of NRHP-eligible OHI sites towards the location of the proposed wind turbine tower show that a view of the wind turbine tower from these historic sites would likely be blocked (Attachment C-5k in Appendix C).

Theoretically, a person standing on a sidewalk in front of the **North Street School** (OHI No. CUY-1658-22) and facing northeast will have a view that contains numerous telephone poles and utility wires, 2-story residential structures, and a mature tree canopy between the residential structures. From the rear parking lot of the **Roosevelt School** (OHI No. CUY-1654-22) facing southeast, the viewshed is dominated by a grouping of trees. Facing south, from a vantage point next to the south elevation of the **Euclid City Hall** (OHI No. CUY-1645-22) the viewshed contains the new Euclid Library and the 2-story clock tower. Mature trees also occur between Euclid City Hall and the Euclid Library. A photograph depicting the view from the **Nottingham Purification Plant** (OHI No. CUY-1659-22) illustrates the viewshed of 1-2 story industrial buildings, utility poles and a high chain link and barbed wire fence. Some mature tree canopy is evident in the distance.

The remaining NRHP-eligible properties, **Paddy's**, located at 920-928 East 222nd Street and **Corner Beverage** located at 923 East 222nd Street, are in a residential area north of the I-90 and CSX rail corridor. As previously mentioned, 20-foot concrete panel noise barriers are located on both sides of the East 222nd Street stretch of I-90. Attachment C-5g of Appendix C (Visual Simulations of Public Space Views Wind Turbine) contains an illustration of the potential view of the wind turbine from a nearby location (Photo 3 of Attachment B-2 in Appendix B: View Shed of St. Christine's School Parking Lot, Euclid, Ohio. Distance is 2,545 Feet from Proposed Turbine). This photograph shows the wind turbine as visible but at the same height as the adjacent tree canopy. This photograph suggests a viewshed from these NRHP-eligible commercial buildings toward the proposed wind turbine site may include the proposed wind turbine, or the wind turbine tower may be fully or partially masked by mature tree canopy.

Digital Mapping and Embedded Aerial Photograph Visual Analysis

This analysis assessed the view of the proposed wind turbine from the six NRHP-eligible sites in the APE. A theoretical line of site was determined for a six-foot tall viewer standing at each of the sites within the APE. This analysis used electronic USGS mapping and AutoCAD mapping with embedded aerial photographs. The line of site from each location to the wind tower was calculated using the relative elevation difference between each individual site and the proposed wind tower. The resulting calculation found the typical angle of sight, above horizontal, at 3-4 degrees or approximately 8-11 percent slope. For every 100 feet of horizontal distance between

a historic property location and the proposed wind tower, the sight line rises approximately 8-11 feet.

With these relatively flat angles/slopes, it seemed apparent that nearby objects (trees, houses, and other buildings) would provide effective screening of one’s view of the proposed wind tower in many cases, as demonstrated in Attachment C-5g in Appendix C. Table 3-7 identifies the height of objects that would screen a person’s view of the tower from 4 of the 5 NRHP eligible properties *and* how far away (in feet) the object would be from the viewer to screen the object. Distances used are listed in 50-foot increments from 50 to 500.

Table 3-7. Height¹ and Distance² of Objects that Would Screen One’s View of the Wind Tower from Potential NRHP-Eligible Sites

	North Street School	Euclid City Hall	Nottingham Purification Plant	Roosevelt School	Paddy’s and Corner Beverage
	5,193 feet away	5,144 feet away	5,070 feet away	4,194 feet away	1,664 feet away
Distance ² from the viewer (feet):	Height ¹ (feet):	Height ¹ (feet):	Height ¹ (feet):	Height ¹ (feet):	Height ¹ (feet):
50	10.1	10.5	10.4	11.5	19.6
100	14.2	14.9	14.7	17.1	33.1
150	18.2	19.4	19.1	22.6	46.7
200	22.3	23.9	23.5	28.1	60.2
250	26.4	28.4	27.9	33.7	73.2
300	30.5	32.8	32.2	39.2	87.3
350	34.6	37.3	36.6	44.7	100.9
400	38.6	41.8	41	50.2	114.4
450	42.7	46.2	45.3	55.8	128
500	46.8	50.7	49.7	61.3	141.5

From the perspective of a 6’ tall person looking from just outside the building, view of top of tower is blocked by an object of this height¹ at this distance² from the viewer.

As Table 3-7 indicates, a line of 40 foot tall trees that is located 150 feet away from the viewer would screen the wind tower for a 6 foot tall person standing at each historic property location. Those same trees at a distance of 300 feet from the viewer standing at any of the locations would also completely screen the view of the wind tower.

Houses that are 25 feet in height, such as the Cape Code or Minimal Traditional style residences that characterizes much of Euclid, and that are located 200 feet from a historic property, would block the view of the tower from the historic property. Even if the view from an OHI site to the proposed tower did not include total blockage of the wind tower, the partial screening of view would prevent the tower from “dominating” the viewshed.

The theoretical calculations from Table 3-7 were then put to the test using standard aerial photographs and oblique aerial photographs of the project area. Graphics were constructed to

show the results (Attachment C-51 in Appendix C). Mature trees were conservatively estimated to be 40 feet tall. The heights of individual buildings were estimated using oblique aerial photographs. The two-dimensional graphics demonstrate both the direction of view towards the tower, as well as the vertical angle of view to the top of the tower. Trees and buildings were placed in the proper position in the vertical angle of view based on their relative locations with respect to the viewpoint.

A viewer standing just outside the south entrance of Euclid City Hall would find that the view of the tower would be totally blocked by the Euclid Library, 300 feet away. A viewer standing on the north side of North Street School would find their view of the tower screened by the trees of a woodlot beginning about 75 feet northeast of the school. Due to the length of the sightline through this woodlot, it is likely that total screening would occur even in winter conditions. The graphics demonstrate that in the majority of cases, nearby trees, houses, and/or other buildings or structures screen or block the view of the tower from the historic properties in the APE.

Shadow Flicker Effect Analysis

A shadow flicker effect analysis (Flicker Report) was conducted for the proposed wind turbine by the Cleveland-based firm JW Great Lakes Wind, LLC. This analysis is discussed above in Section 3.2.4.1. When the Flicker Report is examined from a cultural resources perspective, the wind turbine is not expected to have a shadow flicker effect on historic properties.

Determination of Effects: Below-Ground Archaeological Resources

A desktop review of available resources was conducted to evaluate the potential for recovering archaeological resources within the APE. This desktop review included utilization of the OHPO on-line mapping system, examination of historic mapping and aerial photography, review of the soil survey data for the area, and a review of the physiographic data for the area.

For previously-recorded archaeological sites on the Ohio Archaeological Inventory (OAI), none were documented within the archaeological below-ground APE. The closest recorded archaeological sites were three historic sites approximately 2.5 miles to the northeast of the APE.

Although no archaeological sites were documented within the below-ground archaeological APE or within the one-mile study buffer, Sanborn mapping, which was suggested by the OHPO, was obtained and examined for the project area. The Sanborn mapping did not have documentation of the area before 1950, but URS did examine the 1950, 1952, 1963, and 1966 maps (Attachment C-5m in Appendix C). On all of these maps there were no structures illustrated in the APE.

A review of the land use for this area, which included examination of aerial photographs, and archival data associated with the history of the area, indicates that the APE has been disturbed by industry development, despite historic maps not indicating the previous presence of a structure. Most recently, the area has been used as a private park for Lincoln Electric employees. This park is most likely the same park listed on the 1952, 1963, and 1966 Sanborn maps. Contractor notes associated with the construction of the park indicate that the first four inches of soil were stripped off to remove vegetation, rocks, and debris. Subsequently, topsoil was imported to fill in the stripped area.

Additional information for the area states that this parcel was owned by Euclid Incorporated from roughly 1946 to the late 1970s (Encyclopedia of Cleveland History 2004). Euclid Incorporated corresponds with the buildings labeled “Euclid Road Machinery Company” on the 1952, 1963, and 1966 Sanborn maps. This company manufactured off-highway, earth-moving, and hauling equipment, and the parcel that the APE is situated on, was used as a proving ground for this equipment. Aerial photography from 1952 and 1961 illustrates this disturbance and it is also visible on the aerial mapping within the *Cuyahoga County Soil Survey* (Soil Conservation Service, 1980) (Attachment C-5n in Appendix C).

The archaeological APE is within the Erie Lake Plain, which is a very low relief ice-age lake basin separated from modern Lake Erie by shoreline cliffs (Brockman 1998). This region marks the former extent of Lake Erie (Lake Whittelsey) as the last Wisconsin-age glacier retreated from Ohio (Ohio History Central 2010). The soil survey for Cuyahoga County indicates that the APE is within Urban land (Ub), which is where 80 percent of the surface is covered by asphalt, concrete, buildings, or manmade surfaces (Soil Conservation Service, 1980:47). Areas contained within this mapping unit include large areas with miscellaneous materials placed in fills (Soil Conservation Service, 1980:47).

The physiographic data of the region, topographic mapping, historic aerial photography, and soil survey data for the area was reviewed by a geomorphologist. That review identifies the APE as being in an area of recessional beach ridges formed when lake levels were receding (approximately 10,000 years ago). Given the setting, it is unlikely that buried cultural deposits (similar to those in a floodplain setting) would be present. In addition, the area appears well-developed which further decreases the chances of deeply buried cultural deposits. It is the opinion of the geomorphologist that the greatest potential for archaeological material would be within the first 12 inches of soil.

In summary, as result of the desktop evidence presented above, the APE has low potential for recovery of archaeological resources. If archaeological resources are identified they most likely would be historic and related to the industrial activity associated with the area. In the event archaeological resources were encountered during excavation, activities would be halted and OHPO would be contacted immediately for consultation and coordination for minimization of potential impacts.

NRHP Effects Determination and OHPO Concurrence

The DOE found that the construction and presence of the proposed Lincoln Electric Wind Turbine at the southeast corner of E. 222nd Street and St Clair Avenue in Euclid, Ohio will have no adverse effect on the character-defining features of above discussed properties listed in or eligible for listing in the NRHP. OHPO concurred with this determination in a letter dated July 8, 2010 (See Attachment C-6 in Appendix C).

3.2.12 Human Health and Safety

Workers can be injured or killed during construction, operation, and decommissioning of wind turbines through industrial accidents such as falls, fires, and dropping or collapsing equipment. Such accidents are uncommon in the wind industry and are avoidable through implementation of proper safety practices and equipment maintenance.

Collapse of a turbine or breakage (and throwing) of one or more turbine blades are possible, but very unlikely occurrences. Debris falling from these occurrences would likely be limited to a calculated fall zone, which is defined to approximate the area around the base of the turbine that would likely receive the tower and turbine if it were to fall. Estimates of blade throw vary, but MacQueen, et al., (1983) estimate the probability of being struck outside this area (i.e., within one blade diameter of the tower base) is about 10 to the -7th/year for a fixed building, and substantially less for people who are mobile.

Another potential source of accidents is ice shedding and ice throw. Ice shedding, or ice throw, refers to the phenomenon that can occur when ice accumulates on rotor blades and subsequently breaks free or melts and falls to the ground. Although a potential safety concern, it is important to note that while more than 90,000 wind turbines have been installed worldwide, there has been no reported injury caused by ice thrown from a turbine (Tetra Tech EC, Inc., 2007). The turbine is to be supplied with ice sensors on the turbine blades. When ice forms the sensors will engage and the turbine will not be permitted to rotate until the ice has melted. This technology is intended to prevent ice throws. Ice that has accumulated on the blades will fall to the foot of the turbine as it melts. To prevent accident or injury from ice that falls as it melts, the turbine requires the area directly underneath to be a clear zone. This was a factor when choosing a site for the turbine. The proposed location provides an adequate clear zone underneath the turbine. However, ice shedding does occur, and remains a potential safety concern. GE has established recommendations to mitigate this risk (GE Energy, 2006). These recommendations include physical and visual warnings such as placing fences and warning signs as appropriate for the protection of site personnel and the public and turbine deactivation, i.e., remotely switching off the turbine when site personnel detect ice accumulation. Another risk mitigation strategy is for site personnel to stay slightly upwind of the turbine during potential ice accumulation conditions (Morgan, et al., 1998).

As part of the EA analysis, potential for blade throw, tower collapse and ice throw was examined. The risk assessment for the Lincoln Electric wind turbine has raised several key design issues which could potentially impact the safety of surrounding environment.

The tower blade throw analysis assesses the impact zone around the tower location in the event of a blade failure. Although they are rare, the impact on the surrounding environment due to blade failure must be assessed. The impact zone for blade throw extends in a 150-foot radius around the wind tower with a maximum impact force of 944kN (approximately 225 kips) (See Figure 12 in Appendix A). Similarly, a tower collapse analysis was conducted to assess the risk to the surrounding area in case the tower becomes compromised and gives way. In the event of wind turbine collapse, the towers tend to buckle or bend prior to collapse, therefore the fall zone does not necessarily include the full height of the structure. The tower impact zone was calculated to extend in a 278-foot radius away from the base of the wind tower (See Figure 12 in Appendix A).

There are two residences located at 1062 and 1054 East 222nd Street that are just outside of the tower collapse radius which could be affected if the tower were to fail. Also, the extension on the east west end of the LEC building complex falls within the potential tower collapse radius.

The proposed tower foundation design as specified by the manufacturer requires modifications to ensure structural safety under site specific conditions at the proposed turbine site. LEC has enlisted the support of structural engineers who work exclusively with wind turbines who proposed recommended modifications to the manufacturer specifications for the foundation design which LEC is in process of implementing. Also, although blade throw and tower collapse are very rare (Klepinger, 2007), the blade and tower impact area should have restricted access with very limited public use. Much of the blade and tower impact area is occupied by a private recreation area for Lincoln employees and their families only. The recreation area is open from dawn until dusk from April 15 until October 15 and the area is monitored 24/7 via closed circuit video cameras by a security guard in the main LEC plant. In addition, the wind turbine will have ice sensors. In the unlikely scenario that ice forms on the blade or turbine between April 15 and October 15, LEC security will close the recreation area.

No residential zoning occurs in the tower impact zone. However, two rental apartment buildings are located across East 222nd Street to the west of the proposed turbine location. These rental apartments are approximately 330 feet from the proposed turbine location, or 52 feet outside of the tower impact zone. Figure 13 in Appendix A shows the wind turbine to be approximately 1,200 feet from the nearest residential zoning to the northwest.

A total of six soil samples were collected on the LEC property at the proposed wind turbine location. The samples were submitted to a laboratory for analysis of the following parameters: Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), and metals. The results revealed that for all locations sampled, concentrations of the analytes were well below the Ohio Voluntary Action Program (VAP) Generic Direct-Contact Soil Standards for Commercial and Industrial Land Use Categories as well as the Ohio VAP Generic Direct-Contact Soil Standards for Construction and Excavation Activities.

Project facilities have the potential for members of the public to attempt to climb towers, open electrical panels or encounter other hazards. Public access to the private recreation area is already restricted by LEC and would continue to be restricted. Moreover, the tower base will be fenced to control access and LEC employs 24-hour security for their entire Euclid facility. In addition, the K100 allows no opportunities for outside climbing of the tower.

The Project would be located approximately 2.13 nautical miles (NM) northwest of the Cuyahoga County Airport (CGF). All structures more than 61 meters (200 feet) tall must have aircraft warning lights in accordance with requirements specified by the FAA (See Attachment C-2 in Appendix C).

The term electromagnetic fields (EMF) refers to electric and magnetic fields that are present around any electrical device. Electric fields arise from the voltage or electrical charges and magnetic fields arise from the flow of electricity or current that travels along transmission lines, collector lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors (wire). EMF can occur indoors and outdoors. While the general consensus is that electric fields pose no risk to humans, the question of

whether exposure to magnetic fields potentially can cause biological responses or even health effects continues to be the subject of research and debate. However, wind turbines are not considered a significant source of EMF exposure since emissions levels around wind farms are low [Ontario Chief Medical Officer of Health (CMOH), 2010].

To determine if a proposed wind turbine installation would cause an obstruction to existing microwave communication links in the vicinity of the wind turbine, LEC commissioned an Electromagnetic Interference Report for the project (See Attachment D-6 in Appendix D).

Because no fuel is used in wind energy projects, there would be no process waste streams generated during operation of the wind turbine that could cause health and safety concerns. Some lubricants are used in wind turbines, including gearbox oil, hydraulic fluid, and gear grease that require periodic replacement. These lubricants would be managed in accordance with Federal and state regulations.

3.2.12.1 Direct and Indirect Impacts

All contractors, subcontractors and their personnel are required to comply with all Federal and state worker safety requirements, specifically all of the applicable requirements of the Occupational Safety Health Administration. Safety procedures specific to the Kenersys turbine will be observed whenever work is being done on the turbine (Kenersys, 2009c).

Since the soil sample collected exhibited concentrations of VOCs, SVOCs, and metals well below Ohio VAP standards, excavation of the soils will pose no risks to contractor health or to the environment in general.

No adverse public security impacts are anticipated due to the project. Members of the general public would be prevented from accessing the wind project area by fencing and LEC plant security. Safety signage would be posted around the tower (where necessary), transformers and other high-voltage facilities would be in conformance with applicable Federal and state regulations. LEC employees would be educated as to security procedures to be observed when they are in the vicinity of the turbine.

Due to the extreme rarity of tower collapse or blade throw and the fact that LEC controls all of the blade impact zone and the vast majority of the tower collapse zone, the risks to public safety due to such occurrences can be mitigated by management of access within these zones. The same access management strategies can mitigate the risks to public safety due to ice throw or shedding conditions, which are in effect only on a very limited temporal basis. Additionally, although the residences along East 222nd Street are approximately 330 feet away from the wind turbine site, they are located outside the ice throw or fall zone areas depicted in Figure 12 of Appendix A.

The turbine will be no closer than 1,200 feet to residentially-zoned areas where EMF will be at background levels. Based on the most current research on EMF, and the distance between any turbine and occupied residences, the turbine will have no impact to public health and safety due to EMF.

The Electromagnetic Interference Report for the project concluded that installation of the turbine would pose no potential conflict with the incumbent microwave paths.

Production of hazardous wastes as a result of operation or maintenance of the wind turbine is not expected.

4.0 CUMULATIVE IMPACTS

Cumulative impacts are those potential environmental impacts that result “from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

4.1 Reasonably Foreseeable Projects

Other proposed wind turbine projects for which ARRA grants have been sought in Ohio, other publicly announced on shore wind turbine projects in the Cleveland area, plus the proposed offshore wind turbine project in Lake Erie were examined in connection with this project with respect to potential cumulative impacts. The following is a list of ARRA SEP-awarded projects:

Kilowatts for Kenston - EA
600KW turbine
17419 Snyder Road, Chagrin Falls, Ohio 44023

Archbold Area Local School Project - EA
500KW turbine
600 Lafayette Street, Archbold, Ohio 43502

Pettisville Local Schools - EA
500KW turbine
232 Summit Street, Pettisville, Ohio 43553

Toledo Joint Apprenticeship and Training Committee - CX 100 KW turbine
803 Lime City Road, Rossford, Ohio, 43460

Green City Growers Wind Development - EA
1.5 MW turbine
Inner City of Cleveland Greenhouse 55th St. and Woodland Ave, Cleveland, Ohio 44104.

Cuyahoga County Agriculture Society – EA
600 KW turbine
Cuyahoga County Fairgrounds, 164 Eastland Road, Middleburg Heights, Ohio 44017

Toledo Wind Electric Generation System at the Collins Park Water Treatment Plant
1.0 MW turbine
600 Collins Park Drive

See Figure 14 in Appendix A for a map showing the locations of these projects. They are all single turbine projects. Of these projects, only the Green City Growers’ and Cuyahoga County Agricultural Society projects are in the same county as the LEC project. These other Cuyahoga

County projects are 10 and 23 miles distant from LEC, respectively. The Kenston project is over 17 miles distant, while the closest western Ohio project is over 100 miles distant from LEC.

The only currently operating wind turbines over 100 KW in capacity located in Cuyahoga County are the Great Lakes Science Center Turbine in downtown Cleveland and the Pearl Wind turbine off I-480 in Parma, Ohio.

Cuyahoga County and other lake shore communities, through a non-profit development corporation, are proposing to develop wind turbine projects in Lake Erie. The initial proposed project would be between three to eight turbines of a total capacity of up to 20 MW.

The initial project will be sited near the City of Cleveland Water intake crib off Cleveland Harbor. Future commercial scale projects are anticipated, but sites have not been chosen. One avian risk assessment for the Lake Erie project issued on May 1, 2009, concluded that significant avian impacts were unlikely and a further radar and acoustic study of the Lake Erie project location is now underway. The site of the initial project is about 10 miles from this project site.

None of these projects, when looked at singly, in groups, or altogether, will present significant cumulative impacts to visual or biological resources. Because of the small scale of each individual project and the sufficient distance between projects, therefore cumulative impacts are not anticipated.

4.2 Summary of Cumulative Impacts

Cumulative Greenhouse Gas Impacts

While the scientific understanding of climate change continues to evolve, the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report has stated that warming of the Earth's climate is unequivocal, and that warming is very likely attributable to increases in atmospheric greenhouse gases caused by human activities (anthropogenic) (IPCC, 2007). The IPCC's Fourth Assessment Report indicates that changes in many physical and biological systems, such as increases in global temperatures, more frequent heat waves, rising sea levels, coastal flooding, loss of wildlife habitat, spread of infectious disease, and other potential environmental impacts are linked to changes in the climate system, and that some changes may be irreversible (IPCC, 2007).

The release of anthropogenic greenhouse gases and their potential contribution to global warming are inherently cumulative phenomena. It is assumed that this wind energy project would displace fossil fuel electricity currently used by LEC, resulting in a net decrease in emissions of approximately 3,972 short tons (3,547 long tons or 3,604 metric tons) of CO₂ equivalents for each year of operation. The proposed project would neither reduce the concentration of GHGs in the atmosphere nor reduce the annual rate of GHG emissions. Rather, it would marginally decrease the rate at which GHG emissions are increasing every year and contribute to efforts ongoing globally to reduce greenhouse gases and slow climate change.

Visual Resources

The Proposed Action would affect the viewshed in the project area. The turbine would be a dominant vertical component in the landscape due to its height, but it would not obstruct views

in the way that a large building might. Because the proposed site is within an already developed area and other vertical, industrial features exist, the visual impact is anticipated to be less than if the turbine were located on a flat, rural landscape. Although there are several wind projects projected to be constructed in the region surrounding the proposed LEC turbine, none of them are located within the likely view shed of one another. The closest proposed turbine, Green City Growers' in downtown Cleveland would be approximately 10 miles away. Therefore, there would not a be a cumulatively significant visual impact from proposed LEC wind turbine

Biological Resources

Most of the reasonably foreseeable single wind turbine projects in the vicinity discussed above have received a letter from ODOW indicating that avian and bat species were not at risk as a result of the turbines individually and 4 of these projects have letters from the USFWS indicating that there are no threatened or endangered species, or bald eagle concerns, but requesting implementation of avoidance measures in the Interim Guidelines to Avoid and Minimize of Impacts Wind Projects (USFWS 2003). All of these letters were issued by the same office and same individuals at these offices over the same time period. Additionally, these are single turbines spread out over more than 100 miles, and the anticipated potential to result in a cumulative impact to avian or bat species is low.

Given the LEC project's urban, industrial setting, there are no other potential cumulative impacts on the environment that are reasonably foreseeable.

5.0 IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible and irretrievable commitment of resources is defined as a permanent reduction or loss of a resource that, once lost, cannot be regained. The primary irretrievable and irreversible commitment of resources for the Proposed Action would be the labor, materials, and energy expended in clearing the site and constructing the wind turbine. Approximately 0.37 acre of land would be irreversibly committed during the functional life of the project.

6.0 THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE HUMAN ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term use of the environment, as used here, is that used during the life of the project, whereas long-term productivity refers to the period of time after the project has been decommissioned, the equipment removed, and the land reclaimed and stabilized. The short-term use of the project area for the Proposed Action would not affect the long-term productivity of the area. If it is decided at some time in the future that the project has reached its useful life, the turbine, tower, and foundation could be decommissioned and removed, and the site reclaimed and revegetated to resemble a similar habitat to the pre-disturbance conditions. The installation of a wind turbine at this site would not preclude using the land for purposes that were suitable prior to this project.

7.0 UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts associated with the Proposed Action include:

- long-term loss of approximately 0.37 acre of vegetation resulting from the construction of the tower foundation
- an increase in noise levels during construction and operation
- introduction of another dominant vertical element into the existing viewshed
- shadow flicker impacts for a limited number of residences
- a risk of tower collapse within 278 feet of the tower

These impacts are both temporary, in the case of the construction noise, and long-term in regards to the loss of vegetation, visual and shadow flicker impacts and the risk of tower collapse. Overall, impacts of the Proposed Action on the environment and human health are not considered significant as described in the relevant sections in Chapter 3.

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