

Original Questions:

1. Will there be any effort to document the ecological impacts of the project once developed? If yes, will the information be made public? **Project specific.**
2. FERC and state wildlife agencies have roles in determining the ecological impacts of certain power generating facilities. Does FERC or the State of Michigan regulate or otherwise have a role in determining the ecological impacts that a wind energy development may cause? **See response below.**
3. Are there either State or Federal requirements or voluntary measures that are or can be undertaken to mitigate ecological harm (e.g. habitat restoration)? **See response below.**
4. What are the environmental benefits of wind energy compared to coal, oil, natural gas and nuclear? **See response to question L7.**
5. Looking at Duke Energy's Gail Windpower Project proposal as an example, what trees would be removed, land excavated, roads constructed, electricity delivery poles or pylons placed in order to support the turbine system and connect it to the national grid? In other words, what will be the total impact that could result in losses to the existing natural/agricultural/residential environment? I am especially concerned about trees being cut down and habitats disturbed. Do cable trenches connecting turbines usually run 'as the crow flies', slicing across hills, fields, forests and creeks? **Project specific.**
6. Will the earth return to its natural state? Platforms removed and plants restored? **Needs further clarification, but see response to question H3.**
7. Clean up of any contamination allotted for? Restore to natural settings—plants, trees, grasses, food for the animals, so they return? **Needs further clarification.**
8. What are the Environmental Impact methods, Migratory Bird Study methods that should be followed? Are there ASTM Methods or other standard protocols that should be followed for these environmental studies? **See response below.**
9. How does the environmental impact of having wind energy compare with those of solar, coal, natural gas, oil, and nuclear? **See response to question L7.**
10. The US Fish and Wildlife Service suggest a 3-mile buffer along the Lake Michigan shoreline within which wind turbines should be construction. Could the Wind Initiative find out what data was used by USFW to establish this buffer? **See response below.**
11. Is there less impact to the environment and communities if a large wind project is constructed off-shore in Lake Michigan vs. on-shore? **Project specific, but see response below.**
12. Will the developer be held responsible for any erosion or run-off from cleared lands and new roads and any other effect on stream and lake water quality? Who will monitor this effect? **See response below.**
13. Can the community/township require that the applicant share all wind data and environmental studies so that the township expert can examine and determine whether the data warrants turbines? **See response below.**
14. What are the environmental and social impacts of large wind farms? **See response below.**
15. Could the massive foundation for the turbines have an impact on groundwater? **See response below.**
16. Are we allowed to use supporting documentation and/or guidelines and recommendations from the Dept. of Interior, DNRE and/or National Park Service in order to enact ordinances in our township that restrict development of wind energy facilities near lakeshores, inland lakes and sensitive wildlife habitats? **Needs further clarification given the range of possible documentation/guidelines.**

Questions and Responses:

These questions may have been recategorized and reorganized. Some may have been sent to another "theme" area (this

will have been explained in red under the “Original Questions” section). In other cases two or more questions will be answered with one response.

H2. FERC and state wildlife agencies have roles in determining the ecological impacts of certain power generating facilities. Does FERC or the State of Michigan regulate or otherwise have a role in determining the ecological impacts that a wind energy development may cause?

Response: The Federal Energy Regulatory Commission does not regulate these impacts. The US Fish and Wildlife Service prepared guidelines for wind development. See section B on wildlife for more about those guidelines.

H3. Are there either State of Federal requirements or voluntary measures that are or can be undertaken to mitigate ecological harm (e.g. habitat restoration)?

Response: There are a number of recommendations and guidelines that have been created to reduce the impact of wind energy on wildlife. Ecological mitigation strategies are similar, and often overlap with wildlife considerations, which are discussed further in response to question B29.

H8. What are the Environmental Impact methods, Migratory Bird Study methods that should be followed? Are there ASTM Methods or other standard protocols that should be followed for these environmental studies?

Response: The following protocol was recommended by experts given the scale of migration. Diurnal observations begin at sunrise to capture the passerine movement and continue into the day (~7 hours) to capture raptor movement. Observations also occur late afternoon (~4pm) to sunset to capture raptor, nighthawk, and passerine movement. Radar are used at strategic sites to capture nocturnal bird (passerine and owl) movement along the shore and inland throughout the migration season. Studies are conducted for at minimum 3 consecutive years from mid-August through October or November depending on location. This protocol does not include waterfowl or bats, two other important pieces of the Great Lakes migration phenomenon.

However, there are some obvious reasons why this protocol is not feasible when answers are needed about wind siting in a short time frame. Utilizing existing data may be crucial to properly placing turbines. For example, known stopover site maps and hawk migration stations can provide some general answers on where and when large numbers of birds occur. Local Audubon chapters, Muskegan Hawk Watch, DNR, and FWS bird experts should be consulted to determine the best study methods.

H10: The US Fish and Wildlife Service suggest a 3-mile buffer along the Lake Michigan shoreline within which wind turbines should be construction. Could the Wind Initiative find out what data was used by USFW to establish this buffer?

Response: The rationale for the 3-mile buffer is based on a combination of sources, including studies by Anna Peterson (at Univ of Minnesota), the Hawk Ridge Bird Observatory, The Nature Conservancy, and other hawk migration stations around the Great Lakes. The Great Lakes region joint venture (US and Canada) and The Nature Conservancy are in the process of developing wind-wildlife recommendations for Great Lake coastlines. Anna Peterson’s research on the North Shore birds can be accessed at research: <http://www.glc.org/energy/wind/sosworkshop/pdf/Peterson-WindWildlife.pdf>

Also see the 2011 study by Anna Peterson and Gerald Niemi, titled “Minnesota’s Lake Superior Coastal Program Mitigating Conflict between Potential Wind Turbines and Migratory Birds on the North Shore – Phase 2”. This document is in the AES repository for this project under “wildlife”.

H11. Is there less impact to the environment and communities if a large wind project is constructed off-shore in Lake Michigan vs. on-shore?

Response: This is project specific; the impacts will vary by community and depend on the scale of the project and where it is being sited off-shore and how electricity will be transmitted. See response to question DD1 for a description of off-shore wind development impacts.

H12. Will the developer be held responsible for any erosion or run-off from cleared lands and new roads and any other effect on stream and lake water quality? Who will monitor this effect?

Response: It is beyond the scope of this project to respond to potential impacts of the Duke Energy project. In general, township ordinances can require strategies be adopted to control for erosion, road monitoring and include decommissioning measures to restore, regrade and replant areas where foundations, roads, and buildings were located. See response to question 11.

Some elements of a wind energy project (i.e., road construction or grading plans) are similar to the requirements for any development project. Monitoring may be performed to verify that site work is adequately protecting sensitive environmental areas and that road conditions following construction have not degraded. In general, it is the responsibility of local authorities to monitor water quality.

H13. Can the community/township require that the applicant share all wind data and environmental studies so that the township expert can examine and determine whether the data warrants turbines?

Response: The Township can require that the applicant provide as much information as is reasonably needed for the Township officials to evaluate whether the proposed wind turbine conforms to applicable standards in the zoning ordinance. For example, if wind turbines are permitted as a “special use” site plan, or other required approval within the Township, or require the submission of the site plan for approval, or if the Township adopts additional, wind turbine specific requirements, all of these types of regulation might very well include standards for which wind data and environmental studies might be necessary for their evaluation.

In addition, if authorized by a Township ordinance or policy, the Township can require that the applicant pay for experts that the Township hires to provide an independent analysis. See more about this by referring to the response to question KK4.

H14. What are the environmental and social impacts of large wind farms?

Response: Answering this question comprehensively is beyond the scope of this project. For an extensive description of the many impacts – both environmental and social – of wind energy, read the 2007 report by the National Research Council titled “Environmental Impacts of Wind Energy Projects”. It can be downloaded at http://www.nap.edu/catalog.php?record_id=11935.

H15. Could the massive foundation for the turbines have an impact on groundwater?

Response: The impact of a turbine foundation on groundwater depends both on the landscape and the construction strategies used at the time of development. These potential impacts would most likely be documented in a project’s environmental impact assessment. If carried out using best management practices to limit the impact of construction, there should be no longterm effect on groundwater in the area.