Burl Haar
Executive Secretary

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

# NOTICE OF THE POWER PLANT SITING AND TRANSMISSION LINE ROUTING PROGRAM ANNUAL HEARING

*Issued: December 4, 2012*

**Notice is Hereby Given** that the Minnesota Public Utilities Commission (Commission) will hold the annual public hearing on the Power Plant Siting and Transmission Line Routing Program on:

**Friday, December 21, 2012**
**1:00 PM at the Public Utilities Commission – Large Hearing Room**
**121 7th Place East, Suite 350**
**St. Paul, Minnesota 55101**

The annual hearing is required by Minnesota Statute § 216E.07, which provides that:

> *The commission shall hold an annual public hearing at a time and place prescribed by rule in order to afford interested persons an opportunity to be heard regarding any matters relating to the siting of large electric generating power plants and routing of high-voltage transmission lines. At the meeting, the commission shall advise the public of the permits issued by the commission in the past year....*

The Agenda for the Hearing is available below and on the Commission's website at www.puc.state.mn.us. Administrative Law Judge Ann O'Reilly will preside. The Judge will take oral or written statements from any person at the Annual Hearing. In addition, written comments may be submitted until **4:30 PM on Friday, February 1, 2013**. Please refer to Commission Docket No. E-999/M-12-360 and OAH Docket No. 65-2500-30183 in the subject line of all correspondence.

Comments should be submitted directly to Judge O'Reilly at:

**The Honorable Ann O'Reilly**
**Office of Administrative Hearings**
**PO Box 64620**
**St. Paul, Minnesota 55164-0620**
**Email: routecomments.oah@state.mn.us or Fax: 651-361-7936**

At the close of the comment period, Judge O'Reilly will provide the Commission with a written summary of the hearing testimony and the written comments received during the comment period.

Questions regarding this matter should be directed to Commission staff at (651) 296-0406, Option 1 or via email at consumer.puc@state.mn.us.



EXHIBIT 11

Please be advised any comments made in this proceeding will not be part of the record in any other Commission docket. Accordingly, comments on a specific project currently under review should be submitted during the comment period for that specific docket.

The Commission hearing rooms have wheelchair access. If other reasonable accommodations are needed to enable you to fully participate in a Commission meeting (i.e., sign language or large print materials), please call 651-296-0406 (voice) or 1-800-657-3782 at least one week in advance of the meeting. Persons with hearing or speech disabilities may call us through Minnesota Relay at 1-800-627-3529 or by dialing 711.

**This document can be made available in alternative formats (i.e., large print or audio tape) by calling 651-296-0406 (Voice) or 1-800-627-3529 (TTY relay service).**

---

**Minnesota Public Utilities Commission**
**Annual Public Hearing on Power Plant Siting Act Program**

**1:00PM, Friday, December 21, 2012**
121 7th Place East, Suite 350
St. Paul, Minnesota 55101-2147
3rd Floor LARGE HEARING ROOM

---

*MEETING AGENDA*

I. Introductions
II. Overview of Programs
  A. Public Utilities Commission – Facilities Permitting Unit
  B. Department of Commerce – Energy Facilities Permitting Unit
  C. Role of Other State Agencies
III. Projects Reviewed
  A. Projects Completed in 2012
  B. Pending and Anticipated Projects
  C. Electric Facilities Subject to Power Plant Siting Act
    1. Generating Plants
    2. Transmission Lines
IV. Public Questions and Testimony
V. Adjourn

## O'Reilly, Ann (OAH)

**From:** Carol A. Overland <overland@legalectric.org>
**Sent:** Friday, February 01, 2013 4:08 PM
**To:** *OAH_Routecomments.oah
**Subject:** 12-360 PPSA Annual Hearing Comments
**Attachments:** Comment Feb 1 2013 for 2012.pdf

Judge O'Reilly -

The attached Comments have been eFiled moments ago. A similar Comment was also filed in the rulemaking docket, 12-1246, last week.

Thanks for the opportunity to Comment.

Carol A. Overland
Attorney at Law

--

"Our lives begin to end the day we become silent about the things that matter." Dr. Martin Luther King, Jr.

Carol A. Overland
Attorney at Law
Legalectric - Overland Law Office
1110 West Avenue
Red Wing, MN 55066

612-227-8638

overland@legalectric.org

www.legalectric.org
www.nocapx2020.info

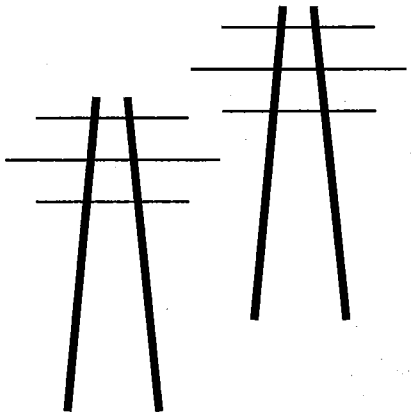
EXHIBIT
tabbies 12

# Legalectric, Inc.

**Carol Overland** **Attorney at Law, MN #254617**
**Energy Consultant—Transmission, Power Plants, Nuclear Waste**
**overland@legalectric.org**

1110 West Avenue
Red Wing, Minnesota 55066
612.227.8638

P.O. Box 69
Port Penn, Delaware 19731
302.834.3466

February 1, 2013

Honorable Ann O'Reilly
OAH
P.O. Box 64620
St. Paul, MN 55164-0620

**eFiled** & routecomments.oah@state.mn.us

RE: **PPSA Annual Hearing Comment – including Comments on Possible Amendments to Rules Governing Certificates of Need and Site and Route Permits for Large Electric Power Plants and High-Voltage Transmission Lines**
**PUC Docket E-999M/M-12-360**
**PUC Docket No. E, ET, IP-999/R-12-1246**

Dear Judge O'Reilly:

Thank you for this opportunity to comment for the 2012 Annual Hearing for the Power Plant Siting Act, and also the associated possible rulemaking. These comments are made by myself as an individual, and not in the course of representing any party.

I am also integrating here and recycling comments filed in the "possible rulemaking" docket, as above, 12-1246.

While I am heartened to see the "possible rulemaking" going forward, there is no direction disclosed, and having made PPSA Comments for nearly two decades, I am not confident the many concerns raised consistently and repeatedly in individual PUC dockets and in 15+ years of PPSA Annual Hearings will be addressed in any manner. On January 24, 2011[1], I submitted a specific Petition for Rulemaking for rules governing Certificates of Need and Site and Route Permits for Large Electric Power Plants and High-Voltage Transmission Lines. At that time, I was instructed to break it down into sections, and have thus far done so with the OAH rules, Chapters 1400 and 1405, and that seems to be moving forward, as a similar "Potential Rulemaking" proceeding has begun and the initial comment period fishing for input is

1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20112-59140-01 | PUBLIC | 10-222 | ☐ | M | CAROL A. OVERLAND | COMMENTS--PPSA ANNUAL HEARING COMMENTS OF CAROL A. OVERLAND | 02/01/2011 |

over for that docket. This Comment includes the rationale and specific proposals regarding PUC Rules, which I will also submit separately AGAIN as a formal Petition for Rulemaking and attach here for reference.

The need for these rule changes has been explained and demonstrated repeatedly at Power Plant Siting Act Annual Hearings and in the individual Certificate of Need, Routing and Siting dockets. These are detailed in my testimony at the 2010 Power Plant Siting Act Annual Hearing and in filed comments[2], outlined below, with specific proposals in track changes below that.

## RATIONALE FOR RULE CHANGES
## THE PPSA DOES NOT WORK AND IS DYSFUNCTIONAL IN MANY RESPECTS

### Wind Siting Must Be Integrated Into the PPSA

Wind projects are not special. As with any large electrical generating facility, wind projects have impacts. Currently, wind siting is exempted from any environmental review, and this is not appropriate. Wind projects must be subject to review of impacts and mitigation – without this review, they are not sited respectfully or equitably.

Integration of wind siting can be accomplished by either including Minn. Stat. ch. 216F into the Power Plant Siting Act, or by integrating Minn. Stat. ch. 216F into Minn. Stat. ch. 216E.

### Statutes & Rules have holes

There are areas not specifically covered by the PPSA that should be because some matters are "open to interpretation." Worse, sometimes staff or ALJ interpretation is contrary to rule, against public interest, or thwarts public participation, which is a large part of the purpose of the PPSA.

- Task Force formation should be presumed, with broad geographic and jurisdictional representation of local governments, watershed organizations, energy and environmental groups, welcomed by Commerce, not resisted.
- Task Force implementation – need "CITIZENS" and local groups on the Task Force (see rule). This has been restricted in the past to units of local government. Again, broad public participation, not limited participation.
- Notices to newly affected landowners are sent late, particularly for those routes added in scoping, and sometimes routes are added improperly after theScoping Decision and notice is sent at the last minute or not sent at all
- Scoping is broadening inquiry rather than funnel down – Task Force charge is to propose routes, not limit them, and facilitators of task force have improperly limited ATFs.

2

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 20112-59140-01 | PUBLIC | 10-222 | ☐ | M | CAROL A. OVERLAND | COMMENTS--PPSA ANNUAL HEARING COMMENTS OF CAROL A. OVERLAND | 02/01/2011 |

- Shifting burden of proof to public rather than Applicant requires project opponents to function beyond what resources, abilities and knowledge members of the public possess, necessitating retaining counsel and experts at significant expense
- Definition of "adequacy" of environmental review is too narrow

**Intervenor funding is necessary to facilitate public participation**

Intervenors are at an extreme disadvantage in utility infrastructure proceedings, and need direct and indirect support. All the public participation opportunities in the world are useless if the public cannot navigate the system or maintain the investment necessary to be present. It is very difficult for the public learn of their options, the system is arcane and cumbersome, and the process is necessarily long, but long enough to try anyone's patience. For members of the public, presented with so many hurdles, the question is "Why bother? It's a done deal."

Direct or indirect funding is needed for expert witnesses, transcripts, and intervenor compensation. Often transcripts are available at local libraries, but not always, and transcripts should be provided to parties as a matter of course, as they are in other states.

Minnesota needs a Dept. of Public Advocate/Public Intervenor, as is found in New Jersey, Delaware, Iowa, Wisconsin and California and likely other states. The "Public Advisor" must at least enthusiastically offer information about intervention and participatory options provide inquiring persons with public participation statutes and rules!

Participation of the Residential Utilities Division of the AG's office as a party should be mandatory in all dockets affecting ratepayers, including need, siting/routing and PPAs.

**PPSA Specific issues addressed in rule amendments proposed**

Notice must be required, and flawed notice should at some point be fatal flaw to application. Statutory requirement is for notice to be given within 15 days of an application, and a "good faith effort" must be made.

- facilitate local gov't participation, govt's need notice to show up (CATF, Intervene)
- as route changes, notice landowners immediately
  - Brookings – scoping routes, didn't get notice until 2-3 monts later
  - In Brookings (08-1474) the Myrick route didn't get notice until after hearings had ended!!!
  - In Hampton-LaCrosse (09-1448) Cannon Falls route proposals were made the day before public hearings began and were entered into record (Ex. 94 and 95) during the evidentiary hearing.
  - Notice long after application, after scoping decision notices, is not "good faith"

Environmental review- routes not reviewed are not within universe of routes to select from, yet applicants propose them and they are regarded as options for routing. 08-1474 and 09-1448.

Adequacy of environmental review is based only on whether it covers what's raised in scoping decision, and not scope or quality of treatment of issues raised, or whether information presented is correct!

FEIS for many projects are typically not released until AFTER the hearing. This means that at the time of the hearing, parties have no way to know whether there are deficiencies in the FEIS and/or in the content of responses to Comments to be able to raise them in a timely manner.

Agency participation – Agencies should participate in dockets in which they have a stake, but they do not. I am tired of filing subpoena requests for DNR, DOT, but will continue to do so until participation is a matter of course. Rules change proposal is to require state agencies to appear.

The Commission must adopt a policy to ENCOURAGE state and federal agencies to appear:

- Mesaba – took PUC directive to get MPCA to weigh in, PUC could specifically request participation by state and Federal agencies.
- Brookings – took subpoena request x 2, by Fargo they were getting used to it

Agency comments – must be eFiled into routing/siting record **immediately upon receipt**, labeled as agency comments, and posted on eDockets for that docket, and not hidden in EFP site or withheld until release of FEIS. This information is important, and sometimes determinative, of the route choice or whether to issue route permit.

Incomplete applications should be rejected, with project not moving forward until information required is provided, i.e., CapX failure to disclose ultimate owner of project, MP follows suit on a later project.

**Advisory Task Forces – interpretation of rules has been skewed:**

- "Citizen Advisory Task Force" is the rule, yet citizens have been excluded from participation
- Necessity of petitioning because Commerce resists forming Task Forces, i.e., Chisago, Mesaba, CapX Brookings & LaX
- Task Forces increase load for staff, and require commitment of resources – funding needed.
- Process perverted such that no opportunity for public comments at Task Force meetings, takes the "citizen" out of the process, limits broad public participation.
- Failure to provide basic, essential information (I was told to leave meeting when I responded to Task Force member question re: why only one site for Mississippi River crossing was proposed and RUS environmental review addresses three crossings)
- Membership – CapX CATF improperly limited to local governments "Land Use Professionals"
- Everything framed form "Land Use" perspective, which is not charge – where did that originate.
- Members improperly told to narrow issues, not brainstorm

- Members improperly told to make recommendation for a route, but revolted and refused

**Local Review:**

- Local govt's generally not equipped for local review of energy projects
- May not admit it, i.e. Freeborn County's review of Bent Tree (their "environmental review" was to cut and paste the application with a title page saying "Environmental Assessment).
- No expertise or sense, i.e., Freeborn Co. cut and paste application as EA
- Local gov't improperly choosing route not reviewed in EA
- Question of intervention – parties CAN intervene in county permitting
- Local permits properly denied with substantial record and findings but locals don't have resources to stand up to Applicant's challenges
- Devo Agreement with local government before environmental review is a MEPA problem.

**Funding of projects prior to completion of environmental review is MEPA problem:**

> ...a governmental decision cannot be made to grant any related permit until the environmental impact statement has been determined to be adequate. Minn. Stat. 116D.04, subdiv. 2b; Minn. R. 4410.3100, subp. 1. "Permit" is specifically defined to include "the commitment to issue or the issuance of a discretionary contract, grant, subsidy, loan, or other form of financial assistance, by a governmental unit." Minn. R. 4410.0200, subp. 58.

**How is administrative process working?**

- Parties ejected as intervenors where testimony not submitted – no legal basis for this.
- Non-party public not given adequate time or opportunity to question witnesses.
- Intervention – TWICE ordered by ALJ to be incorporated -- no legal basis and contrary to statutory intervention and "party" definition.
- Transcripts – very difficult to participate without access to transcript

## RULEMAKING AMENDMENTS

**Based on the above, NoCapX and U-CAN make the following proposals for specific rule changes, using underline and strike format. These are initial and incomplete suggestions, are not exhaustive, and we reserve the right to amend these proposals going forward:**

**7829.0700 OFFICIAL SERVICE LIST.**

**Subpart 1. Content.**

The official service list for each proceeding consists of the names of the parties and the names of participants who have filed a written request for inclusion on the service list with the executive secretary. The official service list shall be limited to one individual per party. Those on service

lists must identify party represented. Access to officially filed documents shall be available through subscription to eDockets or viewing the website for a particular docket.

**Subp. 2. Establishment and updating.**

The commission shall establish the official service list at the conclusion of the initial comment period and shall mail a copy of the list to the parties and to participants who have filed written requests for inclusion. A list established before commission action on a petition for intervention must include those persons whose intervention petitions are pending. The commission shall mail an updated official service list to the parties and participants if the official service list is later expanded or reduced. The commission need not mail the official service list in proceedings when the only parties are the department and a petitioner, complainant, or respondent.

**Subp. 3. Limiting service list.**

The official service list shall be limited to one individual per party. Access to officially filed documents shall be available through subscription to eDockets or viewing the website for a particular docket. On its own motion or at the request of a party, the commission shall limit the service list to parties to the proceeding if it finds that requiring service on participants is unduly burdensome.

**Subp. 4. Name and address change.**

A party or participant who wishes to change the name or address of a person receiving service on behalf of the party or participant shall provide written notice of the change to the executive secretary and to persons on the official service list.

**Subp. 5. Proceeding before administrative law judge.**

In proceedings before an administrative law judge in which the judge establishes a service list, the names on that service list must remain on the official service list for the remainder of the proceeding. The official service list in a contested case hearing shall be limited to one individual per party.

**7829.0800 PETITION TO INTERVENE.**

**Subpart 1. Filing and service.**

A person who desires to become a party to a proceeding shall file a petition to intervene within the time set in this chapter. The petition must be served on known parties and those persons on the utility's general service list for the matter, if applicable. If during the contested case the scope of impacts is broadened, the intervention deadline shall be extended to allow intervention by newly affected parties. The administrative law judge, with the consent of all parties, may waive the requirement that the petition be in writing.

**Subp. 2. Grounds for intervention.**

The petition must allege the grounds for intervention and must be granted upon a showing that: the person is specifically considered by statute to be interested in the particular type of matter at issue; the person is specifically declared by statute to be an interested party; or the outcome of the proceeding will bind or affect the person with respect to an interest peculiar to that person, as distinguished from an interest common to the public or other ratepayers in general, or the person's interests are not adequately represented by one or more other parties participating in the case. Parties wishing to intervene jointly, and counsel representing more than one party, must specify distinct interests and demonstrate that distinct interests are not in conflict or duplicative. Where interests overlap or are duplicative, such petitioners shall petition to intervene as one party.

**Subp. 3. Intervention as of right.**

The department and the Office of the Attorney General, through its Residential Utilities Division, may intervene as of right in any proceeding before the commission. They become parties upon filing comments under this chapter and need not file petitions to intervene, except when the rules of the Office of Administrative Hearings require it.

**Subp. 4. Objection to intervention.**

An objection to intervention must be filed within ten days of service of the petition to intervene.

**Subp. 5. Disposition of petition.**

If there is no objection to intervention and a petition to intervene is not denied or suspended within 15 days of filing, the petition to intervene must be considered granted, unless the matter is referred to the Office of Administrative Hearings for contested case proceedings before the expiration of the 15-day period. Once granted party status, party intervenors are not required to submit testimony or maintain any level of participation to retain party status.

**Subp. 6. Proceeding before administrative law judge.**

During the time that a matter is before an administrative law judge, intervention procedures are governed by the rules of the Office of Administrative Hearings and by orders issued under those rules by the administrative law judge.

**7829.1000 REFERRAL FOR CONTESTED CASE PROCEEDING.**

If a proceeding involves contested material facts and there is a right to a hearing under statute or rule, upon petition, or if the commission finds that all significant issues have not been resolved to its satisfaction, the commission shall refer the matter to the Office of Administrative Hearings for contested case proceedings, unless:

A. all parties have expressly waived their rights to contested case proceedings and instead request informal or expedited proceedings, and the commission finds that informal or expedited proceedings would be in the public interest; or

B. a different procedural treatment is required by statute.

**7829.1100 PUBLIC HEARING.**

When a public hearing is held in connection with a contested case proceeding, the commission shall, whenever possible, schedule the public hearing to be held before the evidentiary hearings in the area where the infrastructure in question would be located.

**7829.2600 STAFF COMMENTS.**

Written comments on a filing by commission staff must be made available to those persons on the service list at the same time they are provided to the commission. If commission staff recommend action not advocated by any party, all interested and formal parties must be provided opportunity for written comment, and written commentors be granted oral comment at the request of any interested or formal party.

**7829.2700 PROCEDURE AFTER ADMINISTRATIVE LAW JUDGE REPORT.**

**Subpart 1. Exceptions to administrative law judge's report.**

Except in cases subject to statutory deadlines not waived by applicant, parties shall file and serve on the other parties any exceptions to an administrative law judge's report within 20 days of its filing. In cases subject to statutory deadlines, exceptions must be filed and served within 15 days of the filing of the report.

**Subp. 2. Replies to exceptions.**

Except in cases subject to statutory deadlines not waived by applicant, a party shall file and serve on all other parties any replies to exceptions within ten days of the due date for exceptions. In cases subject to statutory deadlines not waived by applicant, replies are not permitted.

**Subp. 3. Oral argument.**

Parties must be granted an opportunity for oral argument before the commission, when requested, as required under Minnesota Statutes, section 14.61.

**7850.1000 DEFINITIONS.**

**Subpart 1. Scope.**

As used in parts 7850.1000 to 7850.5600, the following terms have the meanings given them.

**Subp. 2. Act.**

"Act" means the Power Plant Siting Act of 1973, as amended, Minnesota Statutes, chapter 216E.

**Subp. 3. Associated facilities.**

"Associated facilities" means buildings, equipment, and other physical structures that are necessary to the operation of a large electric power generating plant or a high voltage transmission line, including nuclear waste storage facilities.

**Subp. 4. Commission.**

"Commission" means the Public Utilities Commission.

**Subp. 5. Certified HVTL list.**

"Certified HVTL list" means the transmission projects certified by the Public Utilities Commission as priority projects under Minnesota Statutes, section 216B.2425.

**Subp. 6. Developed portion of the plant site.**

"Developed portion of the plant site" means the portion of the LEPGP site that is required for the physical plant and associated facilities.

**Subp. 7. Environmental assessment.**

"Environmental assessment" means a written document that describes the human and environmental impacts of a proposed large electric power generating plant or high voltage transmission line and alternative routes or sites and methods to mitigate such impacts. An environmental assessment does not satisfy the requirements of Minnesota Statutes, section 116D.04.

**Subp. 8. Environmental impact statement or EIS.**

"Environmental impact statement" or "EIS" means a detailed written statement that describes proposed high voltage transmission lines and large electric power generating plants and satisfies the requirements of Minnesota Statutes, section 116D.04.

**Subp. 9. High voltage transmission line or HVTL.**

"High voltage transmission line" or "HVTL" means a conductor of electric energy and associated facilities designed for and capable of operating at a nominal voltage of 100 kilovolts or more either immediately or without significant modification. Associated facilities shall include, but not be limited to, insulators, towers, substations, and terminals.

**Subp. 10. Large electric power facilities.**

"Large electric power facilities" means high voltage transmission lines and large electric power generating plants.

**Subp. 11. Large electric power generating plant or LEPGP.**

"Large electric power generating plant" or "LEPGP" means electric power generating equipment and associated facilities designed for or capable of operation at a capacity of 50,000 kilowatts or more. Associated facilities include, but are not limited to, coal piles, cooling towers, ash containment, fuel tanks, water and wastewater treatment systems, nuclear waste storage facilities and roads.

**Subp. 12. Mail.**

"Mail" means either the United States mail or electronic mail by e-mail, unless another law requires a specific form of mailing.

**Subp. 13. Person.**

"Person" means any individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, ~~however~~ whether or not formally organized.

**Subp. 14. PUC.**

"PUC" means the entire Public Utilities Commission, including the commission and staff.

**Subp. 15. Right-of-way.**

"Right-of-way" means the land interest required within a route for the construction, maintenance, and operation of a high voltage transmission line.

**Subp. 16. Route.**

"Route" means the location of a high voltage transmission line between two end points. A route may have a variable width of up to 1.25 miles within which a right-of-way for a high voltage transmission line can be located. The "alignment" is the proposed placement of a transmission line within the route.

**Subp. 17. Route segment.**

"Route segment" means a portion of a route.

**Subp. 18. Site.**

"Site" means an area of land required for the construction, maintenance, and operation of a large electric power generating plant.

**Subp. 19. Utility.**

"Utility" means any ~~entity~~ public service corporation engaged or intending to engage in this state in the generation, transmission, or distribution of electric energy including, but not limited to, a private investor owned utility, a cooperatively owned utility, a public or municipally owned utility, a limited liability company~~, or a private corporation~~.

**7850.1200 APPLICABILITY.**

Parts 7850.1000 to 7850.5600 establish the requirements for the processing of permit applications by the Public Utilities Commission for large electric power generating plants and high voltage transmission lines. Requirements for environmental review of such projects before the commission are established in the applicable requirements of chapter 4410~~, and~~ parts 7849.1000 to 7849.2100 and 7850.1000 to 7850.5600.

**7850.1500 EXCEPTIONS TO PERMITTING REQUIREMENT FOR CERTAIN EXISTING FACILITIES.**

**Subpart 1. No permit required.**

The following projects are not considered construction of a large electric power generating plant or high voltage transmission line and may be constructed without a permit from the commission:

A. equipment additions at an existing substation that do not require expansion of the land needed for the substation and do not involve an increase in the voltage or changes in the location of existing transmission lines, except that up to the first five transmission line structures outside the substation may be moved to accommodate the equipment additions provided the structures are not moved more than 500 feet from the existing right-of-way;

B. high voltage transmission lines:

(1) maintenance or repair of a high voltage transmission line within an existing right-of-way;
(2) reconductoring or reconstruction of a high voltage transmission line with no change in voltage or capacity and no change in right-of-way, provided that any new structures that are installed are not designed for and capable of operation at higher voltage; or
(3) relocation of a high voltage transmission line that is required by a local or state agency as part of road, street, or highway construction; or

C. large electric power generating plants:

(1) maintenance or repair of a large electric power generating plant;
(2) modification of a large electric power generating plant to increase efficiency as long as the capacity of the plant is not increased more than ten percent or more than 100 megawatts, whichever is greater, and the modification does not require expansion of the plant beyond the developed portion of the plant site. If a subsequent modification results in a total of more than 100 megawatts of additional capacity, this provision does not apply. An increase in efficiency is a reduction in the amount of BTUs (British Thermal Units) required to produce a kilowatt hour of electricity at the facility;

(3) refurbishment of a large electric power generating plant that does not expand the capacity of the plant or expand the plant beyond the developed portion of the plant site and the refurbishment does not require a certificate of need from the public utilities commission;

(4) conversion of the fuel source of a large electric power generating plant to natural gas, as long as the plant is not expanded beyond the developed portion of the plant site; or

(5) start-up of an existing large electric power generating plant that has been closed for ~~any period of time~~one year or less at no more than its previous capacity rating and in a manner that does not involve a change in the fuel or an expansion of the developed portion of the plant site.

**Subp. 2. Minor alteration.**

In the event a modification or other change in an existing substation, high voltage transmission line, or large electric power generating plant does not qualify for an exception under this part, the modification or change may qualify for a minor alteration under part 7850.4800.

**Subp. 3. Notice.**

Any person proposing to move transmission line structures under subpart 1, item A, or to reconductor or reconstruct a high voltage transmission line under subpart 1, item B, subitem (2), or to implement changes to a large electric power generating plant under subpart 1, item C, subitem (2), (3), (4), or (5), must notify the commission in writing at least 30 days before commencing construction on the modification or change.

.

**7850.1900 APPLICATION CONTENTS.**

**Subpart 1. Site permit for LEPGP.**

An application for a site permit for a large electric power generating plant must contain the following information:

A. a statement of proposed ownership of the facility as of the day of filing and after commencement of commercial operation;

B. the precise name of any person or organization to be ~~initially~~ named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated;

C. at least two proposed sites for the proposed large electric power generating plant and identification of the applicant's preferred site and the reasons for preferring the site;

D. a description of the proposed large electric power generating plant and all associated facilities, including the size and type of the facility;

E. the environmental information required under subpart 3;

F. the names of the owners of the property for each proposed site;

G. the engineering and operational design for the large electric power generating plant at each of the proposed sites;

H. a detailed cost analysis of the large electric power generating plant at each proposed site, including the costs of constructing and operating the facility that are dependent on design and site;

I. an engineering analysis of each of the proposed sites, including how each site could accommodate expansion of generating capacity in the future;
J. identification of transportation, pipeline, and electrical transmission systems that will be required to construct, maintain, and operate the facility;
K. a listing and brief description of federal, state, and local permits ~~that may be~~ required for the project at each proposed site; and
L. a copy or link to ~~of~~ the Certificate of Need for the project from the Public Utilities Commission or documentation that an application for a Certificate of Need has been submitted or is not required.

**Subp. 2. Route permit for HVTL.**

An application for a route permit for a high voltage transmission line shall contain the following information:
A. a statement of proposed ownership of the facility at the time of filing the application and after commencement of commercial operation;
B. the precise name of any person or organization to be ~~initially~~ named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated;
C. at least two feasible distinct proposed routes for the proposed high voltage transmission line without overlap and identification of the applicant's preferred route and the reasons for the preference;
D. a description of the proposed high voltage transmission line and all cumulative and associated facilities including the size and type of the high voltage transmission line, including conductor specifications, voltage and capacity;
E. the environmental information required under subpart 3;
F. identification of land uses and environmental conditions along the proposed routes;
G. the names and addresses of each owner whose property is within any of the proposed routes for the high voltage transmission line;
H. United States Geological Survey topographical maps or other maps acceptable to the commission showing the entire length of the high voltage transmission line on all proposed routes;
I. identification of existing corridor of utility and public rights-of-way along or parallel to the proposed routes that have the potential to share the right-of-way with the proposed line;
J. the engineering and operational design concepts for the proposed high voltage transmission line, including information on the range of electric and magnetic fields of the transmission line from light loading, expected loading, and thermal limits;
K. detailed cost analysis of each route, including the itemized costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route;
L. a description of possible design options and costs to accommodate expansion of the high voltage transmission line in the future;
M. the procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line;
N. a listing and brief description of federal, state, and local permits ~~that may be~~ required for the proposed high voltage transmission line; and

O. a copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required.

**Subp. 3. Environmental information.**

An applicant for a site permit or a route permit shall include in the application the following environmental information for each proposed site or route to aid in the preparation of an environmental impact statement:
A. a description of the environmental setting for each site or route;
B. a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services;
C. a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining;
D. a description of the effects of the facility on archaeological and historic resources;
E. a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna;
F. a description of the effects of the facility on rare and unique natural resources;
G. identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route; and
H. a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures.

**7850.2000 APPLICATION REVIEW.**

**Subpart 1. Review by commission.**

Within ten working days of receipt of an application for a site permit or a route permit, the commission shall issue notice of receipt of application and 15 day comment period. After 15 day comment period has run, the commission shall determine whether the application is complete and notify the applicant in writing of the acceptance or rejection of the application. If the commission rejects an application, the commission shall advise the applicant of the deficiencies in the application.

**Subp. 2. Resubmission of rejected application.**

If the commission should reject an application, an applicant may decide to address the deficiencies identified by the commission and resubmit the application with additional information. In this event, the commission shall again issue notice of receipt of application and 15 day comment period and after the 15 day comment period has run, review the application within ten days and determine whether the application is complete and advise the applicant of the commission's determination.

**Subp. 3. Reasons for rejection.**

The commission shall not reject an application if the information that is missing can be obtained from the applicant within 60 days from the date of the application and the lack of the information will not interfere with the public's ability to review the proposed project. If the missing information is not provided, the application will be deemed dismissed and applicants shall resubmit with missing information.

**Subp. 4. Schedule.**

The date of the commission's determination that an application is complete marks the start of the schedule for the commission to make a final decision on a permit application, unless waived by applicants.

**7850.2100 PROJECT NOTICE.**

**Subpart 1. Notification lists.**

The PUC shall maintain the notification lists described in items A and B.

A. The PUC shall maintain a list of persons who want to be notified of the acceptance of applications for site permits or route permits. Any person may request to have that person's name or an organization's name included on the list. The PUC may from time to time request that persons whose names are on the list advise the PUC whether they want to remain on the list, and the PUC may delete any names for which an affirmative response is not received within a reasonable time with notice that the person has been deleted from the list. A person whose name has been removed may request to have the name added back on the list. The PUC shall provide an applicant with the general list upon acceptance of an application.

B. The PUC shall maintain a project contact list for each project for which an application for a permit has been accepted. The project contact list must contain the names of persons who want to receive notices regarding the project. Any person may request to have that person's name or an organization's name included on a project contact list. The PUC shall coordinate with and include names from other sections or agencies, and may add a person's name to the list if the PUC believes the person would like to receive notices about the particular project. The PUC shall provide an applicant with the project contact list upon request.

**Subp. 2. Notification to persons on general list, to local officials, and to property owners.**

Within 15 days after submission of an application, the applicant shall mail written notice of the submission to the following people:

A. those persons whose names are on the general list maintained by the PUC for this purpose;

B. each regional development commission, county, incorporated municipality, and township in which any part of the site or route or any alternative is proposed to be located; and

C. each owner whose property is adjacent to any of the proposed sites for a large electric power generating plant or within any of the proposed routes for a high voltage transmission line. For purposes of giving notice under this item, owners are those persons shown on the records of the county auditor or, in any county where tax statements are mailed by the county treasurer, on the records of the county treasurer, or any other list of owners approved by the commission.

**Subp. 3. Content of notice.**
The notice mailed under subpart 2 shall contain the following information:

A. a description of the proposed project, including a map showing the general area of the proposed site or proposed route and each alternative;

B. a statement that a permit application has been submitted to the PUC, the name of the permit applicant, and information regarding how a copy of the application may be obtained;

C. a statement that the permit application will be considered by the PUC under the provisions of parts 7850.1000 to 7850.5600 and the Power Plant Siting Act and describing the time periods for the PUC to act;

D. a statement that the PUC will hold a public meeting within 60 days and the date of the meeting if it is known at the time of the mailing. If the date of the public meeting is not known, a subsequent notice must be mailed when the meeting is scheduled;

E. the manner in which the PUC will conduct environmental review of the proposed project, including the holding of a scoping meeting and formation of an Advisory Task Force at which additional alternatives to the project may be proposed;

F. the name of the PUC staff member who has been appointed by the commission to serve as the public advisor, if known, or otherwise, a general contact at the PUC;

G. the manner in which persons may register their names with the PUC on the project contact list;

H. a statement that a public hearing will be conducted after the EIS is prepared;

I. a statement indicating whether a certificate of need or other authorization from the Public Utilities Commission is required for the project and the status of the matter if such authorization is required;

J. a statement indicating whether the applicant may exercise the power of eminent domain to acquire the land necessary for the project and the basis for such authority, including "Buy the Farm" Minn. Stat. §216E.12, Subd. 4; and

K. any other information requested by the commission to be included in the notice.

**Subp. 4. Publication of notice.**

Within 15 days after submission of an application, the applicant shall publish notice in a legal newspaper of general circulation in each county in which a site, route, or any alternative is proposed to be located that an application has been submitted and a description of the proposed project. The notice must also state where a copy of the application may be reviewed. The Commission shall send the mailed notice as a press release to legal newspapers in each affected county.

**Subp. 5. Confirmation of notice.**

Within 30 days after providing the requisite notice, the applicant shall submit to the PUC documentation that all notices required under this part have been given. The applicant shall document the giving of the notice by providing the PUC with affidavits of publication or mailing and copies of the notice provided.

**Subp. 6. Failure to give notice.**

The failure of the applicant to give the requisite notice does not invalidate any ongoing permit proceedings provided the applicant has made a bona fide attempt to comply, although the commission ~~may~~ shall extend the time for the public to participate if the failure has interfered with the public's right to be informed about and participate the project.

**7850.2200 PUBLIC ADVISOR.**

Upon acceptance of an application for a site or route permit, the commission shall designate a staff person to act as the public advisor on the project. The public advisor ~~must be available~~shall ~~to~~ answer questions from the public about the permitting process and provide information about participation, comment and intervention opportunities. This information shall include dissemination of siting and routing statutes and rules for guidance. The public advisor shall not give legal advice or other advice that may affect the legal rights of the person being advised, and the public advisor shall not act as an advocate on behalf of any person or any project applicant.

**7850.2400 CITIZEN ADVISORY TASK FORCE.**

**Subpart 1. Authority.**

The commission has the authority to appoint a citizen advisory task force. The commission shall determine whether to appoint such a task force as early in the process as possible. The commission shall establish the size of the task force and appoint its members in accordance with Minnesota Statutes, section 216E.08. The commission shall advise of the appointment of the task force at the next monthly commission meeting.

**Subp. 2. Commission decision.**

If the commission decides not to appoint a citizen advisory task force and a person would like such a task force appointed, the person may request that the commission create a citizen advisory

task force and appoint its members. Upon receipt of such a request, the commission shall place the matter on the agenda for the next regular monthly commission meeting.

**Subp. 3. Task force responsibilities.**

Upon appointment of a citizen advisory task force, the commission shall specify in writing the charge to the task force. The charge shall include the identification of additional sites or routes or particular impacts to be evaluated in the environmental impact statement. The commission may establish additional charges, including a request that the task force express a preference for a specific site or route if it has one. Task forces appointed to evaluate sites or routes considered for designation shall be comprised of as many persons as may be designated by the commission, but at least four citizens and non-governmental organization representatives and one representative from each of the following: Regional development commissions, counties and municipal corporations and one town board member from each county in which a site or route is proposed to be located. It is the responsibility of the citizens advisory task force to address the breadth of the scope of the environmental review, to propose alternate routes, and raise environmental concerns. The citizens advisory task force shall issue a report inclusive of all issues raised and siting/routing options suggested. The public shall be afforded opportunity to make public comments at a designated time in the meeting.

**Subp. 4. Termination of task force.**

The task force shall meet as many times as is necessary to complete its charge, and expires upon completion of its charge, designation by the commission of alternative sites or routes to be included in the environmental impact statement, or the specific date identified by the commission in the charge, whichever occurs first.

**7850.2500 EIS PREPARATION.**

**Subpart 1. EIS required.**

The commissioner of the Department of Commerce shall prepare an environmental impact statement on each proposed large electric power generating plant and high voltage transmission line for which a permit application has been accepted by the commissioner.

**Subp. 2. Scoping process.**

The commissioner of the Department of Commerce shall provide the public with an opportunity to participate in the development of the scope of the environmental impact statement by holding a public meeting and by soliciting public comments. The public meeting required under part 7850.2300 satisfies the requirement to hold a scoping meeting if noticed as such. The commissioner shall provide a period of at least seven days from the day of the public meeting for the public to submit comments on the scope of the EIS. The commissioner shall determine the scope of the environmental impact statement as soon after holding the public meeting as possible. Within five days after the decision, the commissioner shall mail notice of the scoping decision to those persons whose names are on either the general list or the project contact list.

The scoping decision may be appealed to the Department of Commerce Commissioner within 10 days of issuance of the scoping decision. After an appeal, the Commissioner's decision may be brought before the Commission for review. Once the commissioner has determined the scope of the environmental impact statement, the scope must not be changed except upon decision by the commissioner, upon his own or upon Petition, that substantial changes have been made in the project or substantial new information has arisen significantly affecting the potential environmental effects of the project or the availability of reasonable alternatives.

**Subp. 3. Alternative sites or routes.**

During the scoping process, a person may suggest alternative sites or routes to evaluate in the environmental impact statement. A person desiring that a particular site or route be evaluated shall submit to the commissioner of the Department of Commerce, during the scoping process, an explanation of why the site or route should be included in the environmental impact statement and any other supporting information the person wants the commissioner to consider. The commissioner shall provide the applicant with an opportunity to respond to each request that an alternative be included in the environmental impact statement. The commissioner shall include a listing of suggested sites and routes in the scoping decision, but shall include the suggested site or route in the scope of the environmental impact statement only if the commissioner determines that evaluation of the proposed site or route will assist in the commissioner's decision on the permit application. Alternatives not included and evaluated in the environmental impact statement shall not be considered.

**Subp. 4. Scope of EIS.**

The scoping process must be used to reduce the scope and bulk of an environmental impact statement by identifying the potentially significant issues and alternatives requiring analysis and establishing the detail into which the issues will be analyzed. The scoping decision by the commissioner of the Department of Commerce shall at least address the following:

A. the issues to be addressed in the environmental impact statement;

B. the alternative sites and routes to be addressed in the environmental impact statement; and

**C. the schedule for completion of the environmental impact statement.**

D. Agency shall publish copies of all agency comments received in the scoping process.

**Subp. 5. Matters excluded.**

When the Public Utilities Commission has issued a Certificate of Need for a large electric power generating plant or high voltage transmission line or placed a high voltage transmission line on the certified HVTL list maintained by the commission, the environmental impact statement shall not address questions of need, including size, type, and timing; questions of alternative system configurations; or questions of voltage.

**Subp. 6. Draft EIS.**

The draft environmental impact statement must be written in plain and objective language. The draft environmental impact statement shall follow the standard format for an environmental impact statement prescribed in part 4410.2300 to the extent the requirements of that rule are appropriate. The Draft EIS shall include copies of all agency comments received in the scoping process.

**Subp. 7. Public review.**

Upon completion of the draft environmental impact statement, the commissioner of the Department of Commerce shall make the document available for public review by placing a copy of the document in a public library or other governmental office in each county where the proposed project may be located. The commissioner shall send notice of the availability of the draft environmental impact statement to each person on the project contact list maintained under part 7850.2100, subpart 1. The commissioner shall also place a notice in the EQB Monitor of the availability of the draft environmental impact statement. The commissioner shall post the environmental impact statement on the agency's Web page if possible.

**Subp. 8. Informational meeting.**

The commissioner of the Department of Commerce shall schedule a~~n informational meeting~~ hearing to provide an opportunity for the public to comment on the draft environmental impact statement. The ~~meeting~~ hearing must not be held sooner than 20 days after the draft environmental impact statement becomes available. The meeting must be held in a location convenient to persons who live near the proposed project. The commissioner shall send notice of the informational meeting to each person on the project contact list maintained under part 7850.2100, subpart 1. The commissioner shall also place notice in the EQB Monitor. The ~~informational meeting~~hearing may be held just prior to the holding of a contested case hearing on the permit application. The commissioner shall hold the record on the environmental impact statement open for receipt of written comments for not less than ~~ten~~ thirty days after the close of the ~~informational meeting~~hearing.

**Subp. 9. Final EIS.**

The commissioner of the Department of Commerce shall respond to the timely substantive comments received on the draft environmental impact statement consistent with the scoping decision and prepare the final environmental impact statement. The commissioner may attach to the draft environmental impact statement the comments received and its response to comments without preparing a separate document. The commissioner shall publish notice of the availability of the final environmental impact statement in the EQB Monitor and shall supply a press release to at least one newspaper of general circulation in the areas where the proposed sites or routes are located. The contested case hearing record shall remain open for at least ten days for comments regarding the Final EIS.

**Subp. 10. Adequacy determination.**

The Public Utilities Commission shall determine the adequacy of the final environmental impact statement. The commission shall not decide the adequacy for at least ~~ten~~ thirty days after the availability of the final environmental impact statement is announced in the EQB Monitor. The final environmental impact statement is adequate if it:

A. addresses the issues and alternatives raised in scoping to a reasonable extent considering the availability of information ~~and the time limitations for considering~~at the time of the permit ~~application~~review;

B. provides responses to the timely substantive comments received during the draft environmental impact statement review process; and

C. was prepared in compliance with the procedures in parts 7850.1000 to 7850.5600.

If the commission finds that the environmental impact statement is not adequate, the commission shall direct the staff to respond to the deficiencies and resubmit the revised environmental impact statement to the commission as soon as possible.

**Subp. 11. Cost.**

The applicant for a site permit or route permit shall pay the reasonable costs of preparing and distributing an environmental impact statement. The costs must not be assessed separately from the assessment under part 7850.1800 unless that assessment is inadequate to cover the commissioner's reasonable costs of considering the permit application.

**Subp. 12. Environmental review requirements.**

The requirements of chapter 4410 and parts 7849.1000 to 7849.2100 do not apply to the preparation or consideration of an environmental impact statement for a large electric power generating plant or high voltage transmission line except as provided in parts 7850.1000 to 7850.5600.

++++++++++++++++++++++++

Again, thank you for this opportunity to comment. If you have any questions, please let me know.

Very truly yours

Carol A. Overland

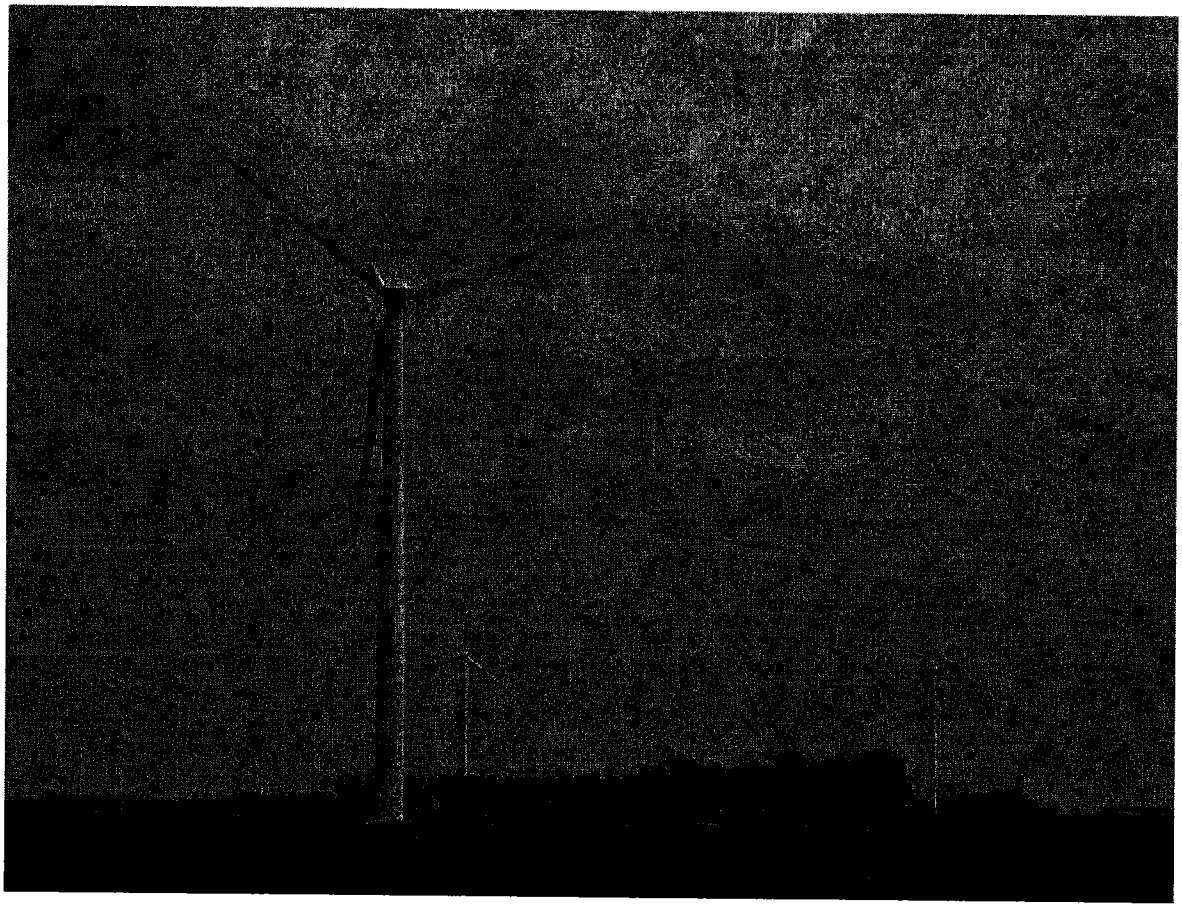
Carol A. Overland
Attorney at Law

cc: Parties on eService for this docket

Draft

# Avian and Bat Survey Protocols

# for Large Wind Energy Conversion Systems in Minnesota



Minnesota Department of Natural Resources

Division of Ecological and Water Resources

October 2, 2012

## Table of Contents

## Introduction

The State of Minnesota has experienced substantial new development of wind energy projects as interest in renewable sources of energy production increases. Wind energy conversion systems provide electricity using an energy source lacking some of the environmental challenges of other sources, with less concern regarding air and water pollution and release of greenhouse gases. Wind energy does, however, have the potential to affect avian and bat species with direct impacts such as collision and barotrauma (tissue damage due to pressure changes), or indirect impacts such as habitat loss, avoidance of habitat, and other behavioral changes. Careful siting of wind projects is considered one of the most useful tools for avoiding and minimizing impacts to birds and bats. Understanding species behavior in relation to the project area helps facilitate proper infrastructure siting, which can be used as a mechanism to avoid and minimize avian and bat impacts. Understanding actual project impacts by assessing fatalities occurring during operation can also inform wind farm operation and help better plan for future project siting.

Using existing data in Minnesota, regarding effects to avian and bat species, has become increasingly difficult due to the expansion of projects across ecological provinces and the use of taller turbines with greater rotor diameters. Although data from other states provides direction for project planning it is often unpublished, results from various survey methods, and describes effects from habitats with different species use than Minnesota. Data specific to projects in Minnesota will assist with understanding possible avian and bat impacts as expanding renewable energy development increases the possibility for cumulative impacts to species populations. Pre- and post-construction surveys are beginning to be conducted in Minnesota. However, methods for surveys are determined by individual project proposers or state and federal agencies on a project-by-project basis. The following standardized pre- and post-construction survey methods are intended to provide for more efficient agency coordination and project development. They also assist in providing a more robust record for decision makers, reduce uncertainty in project development for the wind industry, and provide for more comparable and broad application of results.

The Public Utilities Commission (PUC) and Office of Energy Security (OES) conduct environmental review and site permitting of large wind energy conversion systems for the State of Minnesota. The Minnesota Department of Natural Resources (DNR) is responsible for the regulation of wildlife of the state (Minnesota Statutes 84.027 Subdivision 2), regulates utility crossings, work in public waters, and threatened and endangered species takings, and provides technical input to the PUC and OES regarding possible natural resource impacts of commercial wind energy facility projects. The United States Fish and Wildlife Service (USFWS) provides input regarding federal regulations and recommendations to the PUC and OES. Counties also issue permits for smaller projects (< 5 MW and delegated 5-25 MW). The Agencies (DNR, OES, PUC, USFWS) each perform their regulatory responsibilities and provide coordination and technical assistance among organizations as needed.

The following sections include DNR recommendations for protocols to be used for pre-construction assessment of wind farm siting and project planning and for post-construction assessment of avian and bat fatalities. Pre-construction protocols include methods for assessing avian flight path characteristics, bat presence using acoustic monitoring, and avian use of grassland and wetland habitats. Post-construction protocols are included to assess estimated fatalities to birds and bats at operating commercial wind farms. Coordination with the Agencies is strongly encouraged in the early planning stages of project development to ensure the appropriate surveys, methods, and locations are studied. Agencies can identify potential habitat that should be surveyed, and will identify which protocol(s) should be used in consultation with the project proponent.

It is important to note that a description of commonly used pre-construction point count avian survey methods is not included in the following sections. The intent of DNR recommended survey protocols is to encourage the use of limited resources and time in a way that obtains the most useful data for avoiding avian and bat impacts. The DNR recommends that surveys focus on potential habitat for state-listed (threatened, endangered, or special concern), federally listed species and Species of Greatest Conservation Need (SGCN) rather than on habitats and species often targeted with general point counts. General point counts along roads and disturbed areas (i.e. farm fields) are usually not a valid method, when used alone, for determining the presence of listed species. Point counts along roads typically provide a list of generalist avian species that use fragmented habitat.

Protocol recommendations fit into project planning and operation in a similar manner to United States Fish and Wildlife Service (USFWS) Land-Based Wind Energy Guidelines Tiers 3 and 4. These tiers are recommended for commercial wind projects to complete on-site field assessments (Tier 3) and post-construction surveys (Tier 4). The decision about how to proceed with Tiers 3 and 4, as outlined by the USFWS Land-Based Wind Energy Guidelines, is based on estimated risk level. A project proposer should coordinate with the Agencies to determine an estimated risk level based on desk-top review of potential wind energy project locations and initial site visits to assess natural resource features (see DNR Resources for Project Assessment). Desk-top review and initial site visit steps correspond with Tier 1 and Tier 2 of the USFWS Land-Based Wind Energy Guidelines. Then, as appropriate for the risk level identified, protocols included in the following sections should be used for Tier 3 and Tier 4 analyses. The risk level can also be adjusted as appropriate based on survey results and avoidance of high risk areas during preliminary infrastructure layout planning.

Assessment of specific rare species or other wildlife that may be at risk by development of a commercial wind project should also be completed for each project. If records or surveys indicate the presence of state-listed (threatened, endangered, or special concern) or federally listed species, or if they are present at a project site, project developers should coordinate with the Natural Heritage Review Coordinator (see DNR Resources for Project Assessment) regarding species-specific survey methods. These methods may be in addition to the protocols outlined in this document.

*Avian and Bat Survey Protocols for Large Wind Energy Conversion Systems in Minnesota* is intended to be updated periodically. This approach reflects the dynamic nature of the understanding of interactions between wildlife and commercial wind farms and allows for inclusion of new information as this field of study develops. Also, if wind energy continues to develop in increasingly diverse habitats in Minnesota, such as forested habitats, additional sections may be added to include suitable survey protocols.

## DNR Resources for Project Assessment

-Minnesota State Wildlife Action Plan: Tomorrow's Habitat for the Wild and Rare

http://www.dnr.state.mn.us/cwcs/index.html

-DNR Natural Heritage Information System

http://www.dnr.state.mn.us/eco/nhnrp/nhis.html

-DNR Environmental Review – Regional Program and Contacts

http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

# Section 1

## Risk Determination

The initial wind company risk analysis is the single most important step used to establish a project boundary in a manner that minimizes the risk to wildlife. Properly sited project boundaries result in the Minnesota Department of Natural Resources (DNR) recommending a lower risk level that corresponds to a reduction in wildlife surveys for the project. The DNR preliminary review of proposed wind projects involves an assessment of the potential risks to wildlife by siting turbines and other infrastructure in the prior wind company established project area. The DNR recognizes that assigning risk levels in the preliminary review phase is challenging due to limited pre-construction data (acoustics, flyways, listed species, etc.), unknown migratory paths of neo-tropical migrants and tree bats, sparse information on species behavior/response to turbines, and other undetermined factors. However, assigning a risk level is used to facilitate the discussion on what wildlife surveys should be conducted in order to better inform the decision making process. The DNR may recommend bat acoustics, avian flyway, listed species, avian wetland, or other surveys to further understand the species and their behaviors within a project area. This information can then be used to refine the risk level of the project. The refined risk level is also related to the level (high or moderate) of fatality monitoring that will be recommended.

In some instances a portion of the project site will be considered high risk due to high value habitat being concentrated in one area. Avoiding the placement of infrastructure in high risk portions of the project area may result in lowering the risk level which effectively reduces the survey effort. The remainder of the project area may fall under moderate or low risk categories. In some situations the risk level may be adjusted lower if the project boundary or turbine layout is modified to avoid high risk areas. In other instances the risk level could be adjusted higher if new information is available concerning listed species or survey data indicates a higher level is justified.

During preliminary project development wind developers should refine project boundaries to avoid high value resources. The further avoidance of high value resources is a mechanism to potentially downgrade the risk level of the project area. Typically with a reduced risk level you have a reduced amount of recommended wildlife surveys. As the initial turbine layout is developed it too can be refined to avoid placement of infrastructure in or near high value resources.

Of considerable importance in assigning risk level is the experience of DNR staff that has reviewed and compared projects within the same general landscape. The comparison of projects using Geographic Information System layers, field reconnaissance, and input from field staff allows the DNR to have the unique perspective of understanding the risk level of a project area. Without this background it is difficult to assign risk levels to a wind project site.

Wind project areas are high risk when significant wildlife habitat is within or adjacent to the site that could congregate birds or bats, listed or SGCN species are known to occur in the area, hibernacula are present, migratory or local flyways exist, or other factors are known or suspected. Significant wildlife habitat can be large blocks of grassland or forest, wetland, stream corridors, prairie, or other high value habitats that may increase avian or bat use of the area. The DNR Wind Guidance for Large Wind Energy Conversion Systems outlines many of the high value resources that should be identified during the preliminary development of a project.

Risk assignment can be based on many factors or just 1 high risk factor. For example, if you have a colonial nesting site in a project area that 1 resource could provide the basis for a high risk site. In other project areas it may be a combination of wetlands, streams, state or federal lands, and other wildlife habitat present within or immediately adjacent to the project area.

Some companies may conduct wildlife surveys on projects the DNR believes are low risk sites due to standard company practice or based on USFWS recommendations. In these situations the DNR supports the surveys provided the methods remain valid and the data interpretation is consistent with the quality of the data. The methods should be coordinated with all of the agencies prior to conducting any field work to ensure the methods and manner of interpretation are acceptable to all parties.

Following is a general list of potential factors that can contribute to the risk determination:

Risk Determination Factors

High Risk

High value habitats, as identified using categories in the DNR Wind Guidance document, present with potential avian or bat use.

*Increased number of parcels and acreage of high value habitat increases the risk level due to the probability of increased species diversity and population abundance in the area. The DNR field assessment differentiates quality of habitat present. The position of the high value habitats across the landscape influences risk determination for the entire project or a portion of it.

*The type, acreage, number, and locations of wetlands have a considerable influence on the risk assigned to a project. Typically, as the number and diversity of wetlands increases the risk level increases.

Listed or SGCN avian or bat species known to be present.

*Species behavior or location in relation to turbines increases risk.

*Pre-construction data can influence risk level up or down.

Raptor nests present (emphasis on bald eagles or red-shouldered hawks).

*Raptor nests add to the risk due to the constant flights of adults in and out of the area over long periods for nest building, courtship, and feeding the young.

*Recently fledged birds are still developing their flight muscles, lack maneuverability, and have no prior experience avoiding turbine blades.

*Bald eagle nest presence in or near the proposed wind project increases risk and triggers additional coordination with the USFWS.

Colonial nesting species known to occur within or adjacent to the site.

*Colonial nesting concentrates species into a small area that can have established flight paths to foraging areas. The concentration of inexperienced birds fledging and staging around the sites increases the risk of fatalities.

Hibernacula present in or within 5 miles of project boundary.

*Use data/surveys to establish risk based on species and relative populations.

*The closer to the project area the greater the risk.

*Potential/verified foraging habitat and travel corridors within the project area.

Potential bat roost trees/structures in or within 5 miles of project boundary.

*Suitable roost trees can potentially increase the use of the project area and likelihood of bat turbine interactions.

*Known or surveyed structures occupied by bats (old barns, mine workings, bridges (used for summer roost or maternity sites).

Existing data indicates high use by birds or bats (NHIS, Wildlife Area Manager, other wind project data).

*High use by birds or bats increases fatality risk.

Large blocks of habitat for birds will be fragmented by access roads, turbines, or transmission lines.

*Fragmentation of block habitat reduces forest or grassland interior nesting habitat by species that avoid nesting near habitat edges. Some species, that are intolerant to fragmentation, will no longer nest in habitat patches that are fragmented into small patch sizes.

Pre-construction bat acoustic data indicates high bat passes or migratory bats present.

*Bat specialists major concern is migratory tree bats and verification of use in the project area may result in a higher risk level.

Pre-construction data indicates avian concentration areas.

*Avian concentration areas raise the risk level due to potential fatalities and habitat avoidance.

Pre-construction data indicates avian flight paths exist.

*Avian risk increases when defined flight paths intersect with turbine locations.

Project is high risk when compared to other projects in the same landscape setting.

*DNR staff will have insight on the risk within a particular region when comparing one project area to other projects. The field based experience and review of data from other projects influences the DNR risk level.

Cumulative impacts to the same high value habitat or species locations.

*When projects are located in the same area the combined wind infrastructure can increase the magnitude of potential impacts in the local or regional area. This effectively increases the risk of cumulative fatalities, habitat avoidance, fragmentation, and other impacts.

Other factors as determined on a project by project basis.

Moderate Risk

High value habitats present, but in fewer locations and lower acres than a high risk site.

High value habitats are dispersed or outside of the project boundary.

Reduced amount of potential bat habitat (roost trees, stream corridors, wetlands).

No listed avian or bat species known to be present or listed species present are at a lower risk of fatality.

No significant bat hibernacula within 5 miles (significance is based on species and abundance).

No known avian concentration areas.

Reduced number of SGCN present or they are at a lower risk of fatality.

Pre-construction data suggests the site is of moderate risk.

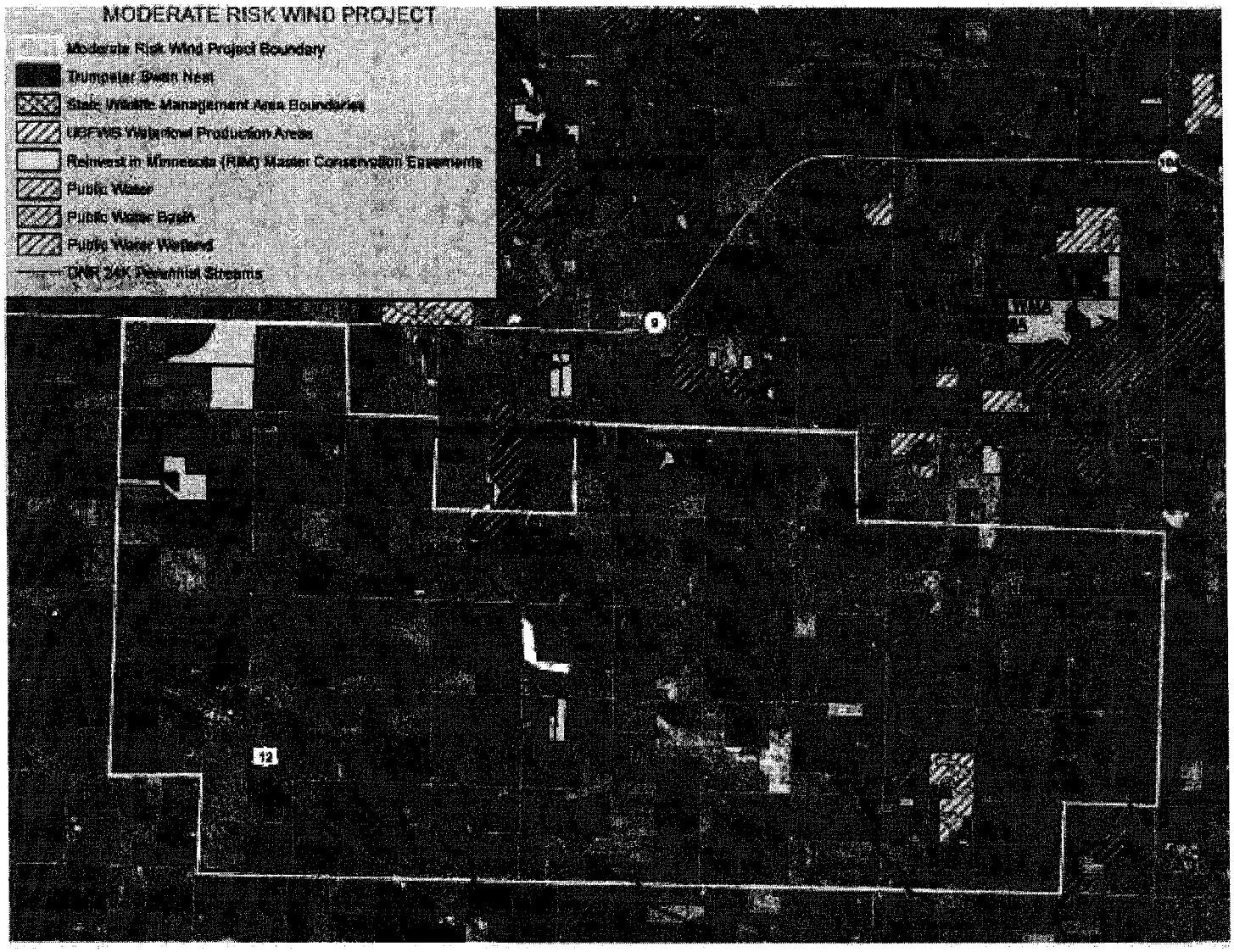
Inconclusive pre-construction data for birds or bats.

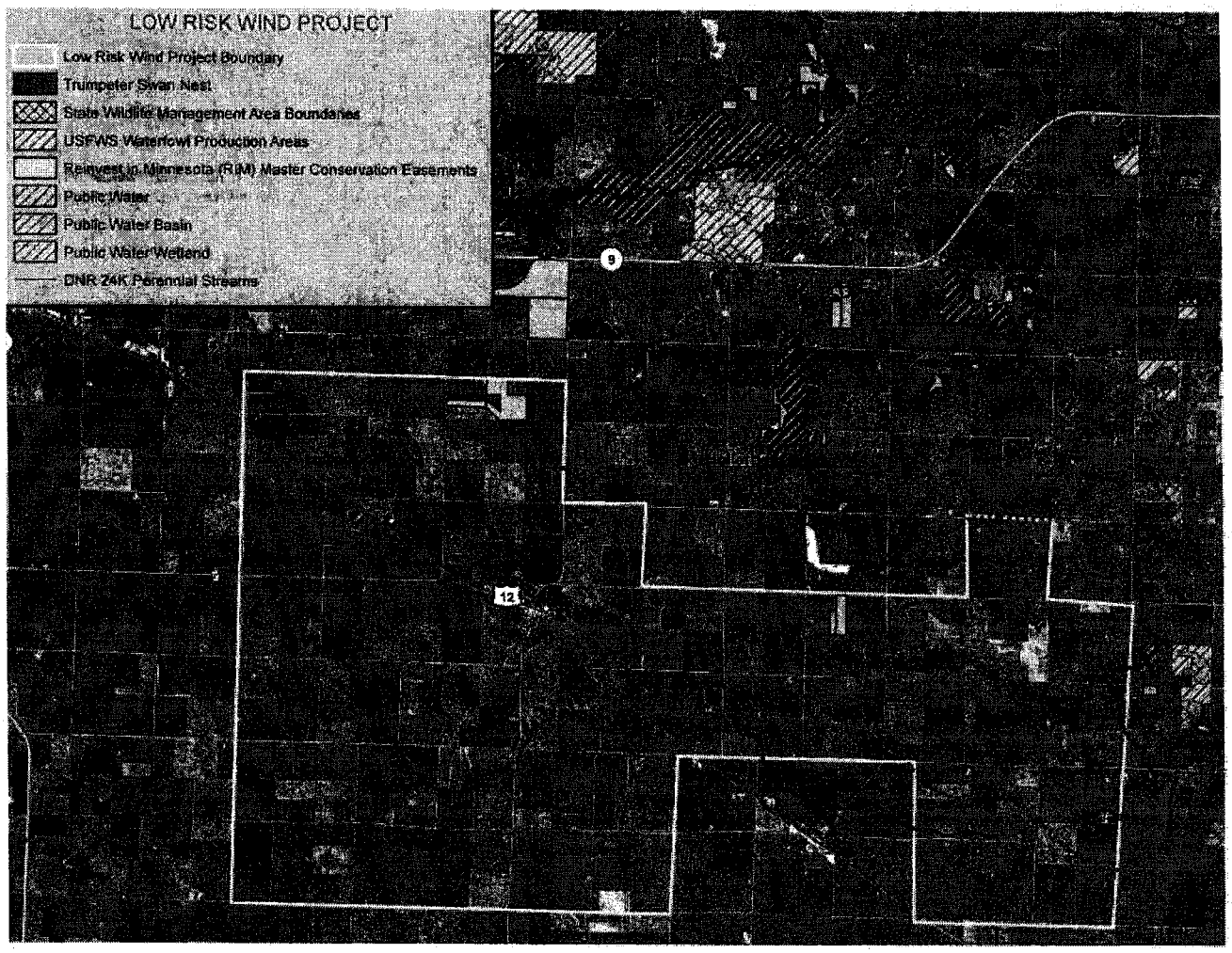
No pre-construction data available.

Unknown migratory paths.

Project is moderate risk when compared to other projects in the same landscape setting.

Following are high, moderate, and low risk maps that will clarify the thought process in determining risk levels for a project. Note that high risk sites have a greater number of parcels containing habitat (Wildlife Management Areas, Waterfowl Production Areas, Reinvest In Minnesota, Public Waters, etc.) than moderate risk sites. Low risk sites have a lack of significant habitat within or adjacent to the project area. Pre-construction data, when available, also factors into the risk level along with the potential for impacts to SGCN or listed species. Also note that by adjusting the project area away from the high value habitats that the risk level may be reduced.


MODERATE RISK WIND PROJECT
Moderate Risk Wind Project Boundary
Trumpeter Swan Nest
State Wildlife Management Area Boundaries
USFWS Waterfowl Production Areas
Reinvest in Minnesota (RIM) Master Conservation Easements
Public Water
Public Water Basin
Public Water Wetland
DNR 24K Perennial Streams
9
10
12


LOW RISK WIND PROJECT
Low Risk Wind Project Boundary
Trumpeter Swan Nest
State Wildlife Management Area Boundaries
USFWS Waterfowl Production Areas
Reinvest in Minnesota (RIM) Master Conservation Easements
Public Water
Public Water Basin
Public Water Wetland
DNR 24K Perennial Streams
9
12

# Section 2

## Bat & Avian Fatality Monitoring at Large Wind Energy Conversion Systems In Minnesota

### Introduction

Fatalities to birds and bats from collisions, or barotrauma, with wind turbines is well documented in the literature. Fatality monitoring is needed in Minnesota in order to improve our understanding of the impacts. Fatality data can be used to improve project micro-siting, future wind project locations, and determine the need for fatality minimization measures. Using standardized fatality protocols allows for the scientific collection of data that can be used to determine reliable fatality estimates that can be compared and pooled with data from multiple wind energy sites within Minnesota. Due to the substantial influx of wind energy conversion systems in Minnesota, the DNR is concerned about potential avian and bat fatalities that occur on a regional and statewide basis. These methods have been designed for use on individual projects or for a statewide perspective concerning fatalities. The same data collection methods and analysis has to be used in order to combine data or to compare data collected from different sites.

Minnesota is home to seven bat species that may be found throughout the state in varying habitat types. There have been records of 428 bird species found within the state with 44 being year round residents and 384 species being migratory. Twenty-eight of these species are listed species (species of concern, threatened, or endangered). Fatalities occur to birds and bats on a regional and statewide basis due to the existing commercial turbines. When fatalities are combined from all of the operational commercial turbines the impacts may be significant to some species. Based on data from July, 2012 the Department of Commerce has indicated that 1,997 known commercial turbines are in operation within Minnesota (PUC web site) with a name plate capacity of 2,739 MW. A hypothetical example of potential fatalities can be expressed as 5 bird and bat deaths per turbine per year x 2,000 operational turbines = 10,000 fatalities per year. With further development to 2,500 operational turbines the number of fatalities expands to 12,500 fatalities per year. These numbers are used solely as an example to crudely illustrate how fatalities may be significant on a cumulative basis. The lack of fatality data available prevents estimating fatalities from operational turbines in the state of Minnesota and assessing species impacts from individual projects and cumulatively.

Fatality data was collected in Minnesota on Buffalo Ridge in the 1990's. Project developers often reference the results of the Buffalo Ridge studies and assume that other locations in Minnesota will have similar fatalities. However, fatality data collected across the country has shown that bird and bat fatalities can vary dramatically from turbine to turbine within the same wind farm and even more from wind farm to wind farm. The variations in fatalities are likely due to differences in topography, habitat, migratory corridors, species present, population levels, weather, turbine design, and prey abundance. The Buffalo Ridge site contains habitat that is substantially different than other locations in Minnesota and radar studies have shown a lower number of avian migrants in the Buffalo Ridge area than in other parts of southern Minnesota.

In addition, turbine design (height, rotor diameter, and cut in/out speeds) and fatality protocol have evolved with the potential to influence actual fatality and fatality estimates. As such, fatality studies need to be conducted in each of the ecological provinces (i.e., prairie/agricultural, deciduous, coniferous) of Minnesota in order to understand impacts of modern wind energy facilities in a variety of habitats and to establish valid avian and bat fatality estimates. In addition, understanding which species are being killed is important for understanding how to avoid and minimize fatalities.

## Fatality Protocol

Fatality protocols have been developed based on the risk level of the project area. High risk sites contain habitat that would congregate birds or bats, verified presence of listed species or SGCN, acoustic data indicates high bat passes or migratory tree bat presence, avian flight paths, or migratory corridors. Moderate or low risk sites contain features similar to high risk, but are concentrated in a portion of the project area or of lower quality. Of considerable importance in assigning risk level is the experience of DNR staff that has reviewed dozens of projects. DNR experience allows for the comparison of risk level among wind projects within a particular landscape.

Minnesota endangered species law (*Minnesota Statutes* section 84.0895) and associated rules (*Minnesota Rules* part 6212.1800 to 6212.2300 and 6134) prohibit the taking of endangered or threatened species without a permit. The MN DNR may recommend specific fatality protocol for project sites with verified state-listed species present within, immediately adjacent to, or that migrate through the project area. The methods may be substantially different than the protocols established within this document and would be determined on a project by project basis.

## Fatality Monitoring For High Risk Sites

Wind project areas are high risk when significant wildlife habitat is within or adjacent to the site, listed species are known to occur in the area, hibernacula are present, or migratory or local flyways exist. Significant wildlife habitat can be large blocks of grassland or forest, wetland, stream corridors, prairie, or other high value habitats that may increase avian or bat use of the area. Pre-construction survey data, if available, will also be considered when determining the risk level. The general risk level of a project area will be determined during the preliminary review of the project. In some instances a portion of the project site will be considered high risk due to high value habitat being concentrated in one area. Avoiding the placement of turbines in high risk portions of the project area may result in lowering the risk level which effectively reduces the survey effort. The remainder of the project area may fall under moderate or low risk categories. In some situations the risk level may be adjusted if the project boundary or turbine layout is modified to avoid high risk areas.

Please note that assigning risk level to projects is challenging due to limited pre-construction data, unknown migratory paths of birds and tree bats, sparse information on species behavior/response to turbines, and other undetermined factors. Assigning a risk level is used to facilitate a greater expenditure of effort on projects with known higher risk features and a reduced effort for lower risk sites. The Agencies may recommend additional monitoring if unusually high fatalities are occurring or if state-listed species are killed.

## Duration and Frequency of Monitoring

All fatality monitoring for high risk sites should be conducted 4 days per week for the period between March 15 and November 15 for 2 or more complete years following construction, unless other credible fatality information is available and reduced monitoring can be justified. The United States Fish & Wildlife Service should be consulted if bald eagles are known to use the project area as the survey period would need to be adjusted to include year round searches or additional monitoring from November 15 to March 15 using modified methods. Daily searches are recommended by numerous states including Pennsylvania (Capouillez et. al. 2007), New York, and Ohio. However, reliable fatality estimates can be achieved using 4 search days per week while effectively reducing survey costs.

Four day per week searches are recommended in order to increase the positive identification of species killed and improve the fatality estimates by decreasing potential bias associated with fewer search days. Increasing the number of search days increases the number of carcasses collected and positively identified prior to scavenger removal. Increasing the positive species identification is essential in understanding the impacts to listed species, species in greatest conservation need, and other avian or bat species killed in high numbers. Without positively identifying which species are being killed you cannot assess impacts to listed or rare species, migratory species, understand cumulative impacts, determine the need for curtailment, or understand habitat to turbine relationships. Without positively identifying the species killed you cannot start to address mechanisms to avoid and minimize impacts because the species behavior and habitat use is crucial to this endeavor. Low searcher detection and high carcass removal can lead to high uncertainty and high variation of estimated mortality (Erickson 2008). In order to reduce the effect of high carcass removal you need to increase the number of search days per week. For additional insight on search days, searcher efficiency, scavenger removal, and bias associated with fatality searches see Arnett (2008), Smallwood (2007), and Strickland (2011).

In order to handle and possess carcasses you will need a DNR Special Permit (Scientific Research) from Wildlife Research (612-713-5438) and a U.S. Fish & Wildlife Service Migratory Bird Permit (612-713-5438).

## Number of Turbines to Monitor

Turbines monitored will follow the guidelines below as per "Standard Fatality Transect Survey", and will include validation procedures to correct for bias. Validation procedures include trials for scavenger removal and searcher efficiency. Monitored turbines should be identified in consultation with the Agencies and focus on the higher risk turbines. Higher risk turbines are located in close proximity to high value habitats as defined by the DNR Wind Guidance for

Large Wind Energy Conversion Systems. High risk locations may include proposed turbines in proximity to habitat supporting listed species, large blocks of grassland or forest, stream corridors, large lakes or wetland complexes, and known avian or bat concentration areas. Twenty percent of the turbines should be searched (minimum of 10 and maximum of 25). A different set of turbines should be monitored in the second year. Coordination with the Agencies should occur to determine which turbines are selected for searches

## Fatality Monitoring Procedures

Scavenger removal and searcher efficiency trials will be performed, and the duration, frequency and number of turbines to monitor are the same. The search area should be cleared of all carcasses prior to March 15 and the initiation of data collection. The carcasses should be identified and reported separately from the data collected from March 15-November 15 and should not be used in the fatality estimates.

At each turbine to be monitored, a rectangular plot that is 80 meters from the base of the turbine in each cardinal direction will be established (160 meters per rectangular side based on the center of the turbine). Although evidence suggests that > 80% of the bat fatalities fall within ½ the maximum distance of turbine height to ground (Erickson 2003a,b) search areas vary and often do not allow surveys to consistently extend to this distance. Strickland (2011) recommends search plots for birds to be approximately the radius of the maximum distance from the ground to the highest point on the rotor swept area. Therefore, the searchable area underneath turbines will be delineated and mapped, and estimates of fatality will be produced. Maps should be constructed illustrating all turbine locations, a designated numbering system for turbines, boundaries of survey areas, and searchable areas (broken down into visibility classes and transect numbering for standard transect surveys).

1) Transects are established that are 6 meters apart that are marked every ten meters. Surveyors search for carcasses within 3 meters of each side of each transect.
2) Searches should start on transects running past the base of the turbine and working outward. Turbines with no vegetation or sparse vegetation should be searched for a minimum of 1 person hour (1 person-1 hour, 2 person ½ hour). Search times for vegetated search areas will vary, but should be slow enough to thoroughly search the area and result in high searcher efficiency. Times spent surveying each turbine should be recorded daily.
3) Fatality monitoring should commence at sunrise and the surveys completed for all turbines within 8 hours.
4) All information gathered (i.e. specimen location, species, transect, etc.) should be entered on the enclosed data sheets.
5) Any large fatality events (per search/turbine) of 5 or more and any single fatality of any eagle, or listed species needs to be reported to the DNR Regional Environmental Assessment Ecologist and Energy Facility Permitting within 24 hours.
6) Separate data sheets will be used for each survey date. All carcasses are to be picked up and bagged upon discovery. Injured/crippled birds or bats are collected and considered as a fatality for data purposes. They are to be identified, handled, and labeled properly with the date, turbine number, transect number, and unique specimen number. The specimen should be frozen for use in the scavenger removal and searcher efficiency trials.

7) All specimens located should have an azimuth from and distance to the turbine that is recorded on the data sheet. A numbered flag can be used for each specimen and the distance and azimuth can be recorded upon completion of transect searches, so long as flags are removed after each day/turbine.
8) Each carcass should have a digital photograph taken and time of death estimated.
9) A summary report of this monitoring, including all data sheets and maps should be submitted by January 1 of each year to the DNR Regional Environmental Assessment Ecologist and should be submitted in accordance with the PUC permit requirements.

## Standard Fatality Transect Surveys

The basis for the methods to be followed for this procedure are set forth by Erickson 2003a, 2003b, Bats and Wind Energy Cooperative 2005 final report, and Kerns and Kerlinger 2004. Turbine search areas should be mapped and labeled into 1 of 4 visibility classes. All visibility classes represented should be included in the map and proportion of each noted in report. Each visibility class will be equally tested for scavenger removal and searcher efficiency trials using carcasses resulting from fatalities at the site (if available).

Visibility Classes: Each turbine will have the vegetation in the searchable area defined into one of the following 4 visibility classes and mapped for submission.

Class 1 (easy): Bare ground 90% or greater; all ground cover sparse and 6 inches or less in height (i.e. gravel pad or dirt road).

Class 2 (moderate): Bare ground 25% or greater; all ground cover 6 inches or less in height and mostly sparse.

Class 3 (difficult): Bare ground 25% or less; 25% or less of ground cover over 12 inches in height.

Class 4 (very difficult): Little or no bare ground; more than 25% of ground cover over 12 inches in height.

1) Following the establishment of searchable areas, the breakdown of this area into visibility classes, and mapping of each turbine, transects should be established at no greater than 6 meters apart and marked every 10 meters.
2) Each transect will be walked while searching ½ of the distance between transects.
3) As transects are searched, carcasses should be bagged and labeled properly (date, turbine number, transect number, carcass number) and a numbered flag placed in their place. At completion of each turbine, the distance and bearing from each turbine should be recorded and then all flags removed.
4) Searches will be abandoned if severe weather is present, and continue if it clears. The time spent searching at all turbines will be recorded and should be consistent.

# Validation Guidelines

Performing scavenger removal and searcher efficiency trials are the standard methods performed to correct for bias in data collection. Below are accepted techniques to perform this correction.

## Scavenger Removal Trials

Because there are numerous variables that may make every turbine unique, we suggest placing an equal number of carcasses per turbine to be monitored for removal by scavengers. Additionally, all 4 visibility classes should have a sample size equal to the percentage of that visibility class (ex. 60% of search area of Class 1 gets 60% of the carcasses placed). A random bearing and distance from the turbine should be selected to determine placement of the carcass. For these trials, carcasses must be placed within the surveyed area underneath turbines after sunset and under darkness, and monitored for removal every 24 hours. If possible, fresh carcasses or ones frozen for a limited amount of time should be used. The use of older/dried out carcasses may bias the results because they might not be scavenged at the same rate as fresh ones. The carcasses should be left in place for a 14 day trial length. Ideally, the total number of bird and bat carcasses used should be representative of the actual size and species of killed animals, with no less than 50 specimens monitored per year. If possible, scavenger removal rates should be determined separately for birds and bats due to potential differences in scavenger removal rates. The number of specimens used for scavenger removal trials should be increased when visibility classes are considerably different in vegetation height and density by using 50 per major visibility class. These trials should be performed periodically throughout the season to account for varying conditions. Before placement, each carcass must be uniquely marked in a manner that does not cause additional attraction and have its location recorded. Records shall include the turbine number, a brief description of immediate vegetation that may impede visibility, classification using one of the 4 visibility classes described above, and length of time before removal.

## Searcher Efficiency Trials

To produce the best estimates of fatality, a high number of searcher efficiency trials will be performed. A minimum of 100 individual trials per survey year will be performed to test searchers. If possible, searcher efficiency should be determined separately for birds and bats as detection rates of bats may be lower than birds. The carcasses will be numbered and toe clipped for identification with no more than 2 placed at any one turbine per trial. Carcasses missed by searchers will be picked up after the efficiency trial ends. The use of new fatality estimators may require the carcasses remain in place for several searches in order to replicate how searchers find carcasses. The habitat surrounding turbines may vary considerably and searcher efficiency appears highly correlated to visibility and habitat types. Therefore, the search area defined for each turbine surveyed will be divided into the 4 visibility classes. The distribution of carcasses is based on the percentage of each visibility class and will be placed at a random azimuth and

distance. Each turbine monitored by searchers should be examined, with an equal number of carcasses placed at each turbine.

Testing should occur sporadically throughout monitoring periods and searchers must not be made aware they are being tested. An effort should be made to test searchers equally during both inclement and good weather, with weather conditions recorded. Carcasses placed should be representative of the percentage and number of species found during the fatality monitoring, and should replicate the manner in which the majority are found in that visibility class (i.e. crawled under vegetation). An effort to maximize the number of carcasses placed is best, with no less than 100 per survey year. If searcher efficiency is low (<30%) based on initial trials then the search time should be increased, distance between transects reduced, or additional staff training should be conducted.

## Estimators of Fatalities

Fatality estimators are known to vary considerably from one method to another. For valid fatality estimates only the most contemporary equations should be used as some of the original versions may be biased under some circumstances. The equations used in various estimators are currently being tested and refined and may change over time. The estimator used may also be influenced by the number of search days per week used on the project. Strickland (2011) discussed estimators in The Comprehensive Guide To Studying Wind Energy/Wildlife Interactions. The DNR recommends using the Manuela Huso estimator (Arnett 2009) and two other modern methods for comparison purposes. The Huso method should be adjusted to leave searcher efficiency trial carcasses in the field over multiple searches in order to improve the probability of searcher detection. The Erickson method (Erickson 2004) can be used in order to compare fatality results to other projects that have used that estimator. Standardization of the estimators is essential when comparing fatality estimates from project to project.

## Fatality Monitoring For Moderate Risk Sites

Monitoring methods for moderate risk sites are designed to collect information on fatalities for project areas with no state listed species known to occur in the area, fewer large blocks of habitat exist, and locations of migratory or local flyways are unknown in the area. The moderate risk methods are designed to determine if fatalities are higher than expected or if listed species are being killed even though no pre-existing records were known. The Agencies may recommend additional monitoring using the high risk methods if fatalities are high or listed species are killed.

The moderate risk methods are the same as the high risk methods except for the following modifications:

1) Minimum of 2 search days per week with a minimum of 2 days separating each search day.
2) Monitoring is conducted for 1 year or more.
3) Search area of 80 m (160 m per rectangular side) in all cardinal directions from the base of the turbine.
4) Searcher efficiency trials using a minimum of 75 carcasses placed.

5) Scavenger removal trials using a minimum of 50 carcasses placed.
6) Search time per turbine remains at 1-2 hours.

## Fatality Monitoring For Low Risk Sites

The DNR encourages developers to locate projects in the lowest risk areas. If fatality monitoring is voluntarily conducted at low risk sites, the DNR suggests the methods outlined below to ensure a consistent approach and comparable data between wind projects. Monitoring methods suggested for low risk sites are designed to collect information on fatalities for project areas with no state-listed species concerns, little to no large blocks of habitat, and no known migratory or local flyways.

1) Minimum of 1 year of searches.
2) Minimum of one search day per week with a minimum of 3 days of separation between searches.
3) Minimum number of turbines searched is 10.
4) Search area of 80 m (160 m per rectangular side) in all cardinal directions from the base of the turbine.
5) Search time periods covering the peak fatality periods of March 15-June 15 and August 1-October 15.
6) Searcher efficiency trials using a minimum of 75 placed carcasses.
7) Scavenger removal trials using a minimum of 50.

Monitoring of low risk sites is considered baseline data collection to determine if avian or bat fatalities are greater than anticipated. Additional monitoring may be recommended if fatalities are high or if state-listed species are killed. Data collected using low risk site methods should not be used to draw strong conclusions concerning fatalities at the site or be extrapolated to predict fatalities at adjacent wind farms due to the limited monitoring that is conducted.

## Data Collection and Reports

Data collection forms are provided as Appendix A and should be used in order to compare data from project to project. The Fatality Report Guidelines (Appendix B) will enable the results and data to be collected in a consistent manner that can then be used to assess known impacts and refine future projects. The data needs to be reported using the Fatality Report Guidelines in order to facilitate the comparison of data among projects. Annual and final reports are recommended along with ongoing dialogue with the Agencies. Data should be provided to the Natural Heritage Review Coordinator (651-259-5109) in electronic format/disc for entry into various DNR databases.

## References


Arnett, E.B., M.R. Schirmacher, M.M.P.Huso, and J.P. Hayes. 2009. Patterns of bat fatality at the Casselman Wind Project in south-central Pennsylvania. An annual report submitted to the Bats and Wind Energy Cooperative and the Pennsylvania Game Commission. Bat Conservation International. Austin, Texas, USA.

Arnett, E.B., et al. 2008. Patterns of Bat Fatalities at Wind Energy Facilities in North America. Journal of Wildlife Management. 72(1):61-78.

Arnett, E.B., technical editor. 2005. Relationships between bats and wind turbines in Pennsylvania and West Virginia: an assessment of bat fatality search protocols, patterns of fatality, and behavioral interactions with wind turbines. A final report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.

Capouillez, W.A., D. Gross, G. Turner, et al. 2007. Pennsylvania Game Commission Wind Energy Voluntary Cooperative Agreement. Pennsylvania Game Commission. Harrisburg, Pennsylvania, USA.

Erickson, W.P., J. Jeffrey, K. Kronner, K. Bay. 2004. Stateline Wind Project Wildlife Monitoring Final Report, July 2001-December 2003. Technical report peer-reviewed by and submitted to FPL Energy, the Oregon Energy Facility Siting Council, and the Stateline Technical Advisory Committee.

Erickson, W.P. 2008. Fatality Impacts to Birds and Bats. NWCC Wildlife Workgroup Research Meeting VII. Milwaukee, WI.

Kerns, J. and P. Kerlinger. 2004. A study of bird and bat collision fatalities at the Mountaineer wind Energy Center, Tucker County, West Virginia: Annual Report for 2003. Cape May Point, N.J.: Curry & Kerlinger, LLC. 39 p.

Smallwood, K.S. 2007. Estimating Wind Turbine-Caused Bird Mortality. Journal of Wildlife Management. 71(8):2781-2791.

Strickland, M.D., E.B. Arnett, W.P. Erickson, D.H. Johnson, G.D. Johnson, Morrison, J.A. Shaffer, and W. Warren-Hicks. 2011. Comprehensive Guide to Studying Wind Energy/Wildlife Interactions. Prepared for the National Wind Coordinating Collaborative, Washington, D.C., USA.


Protocol Version: October 2, 2012

**Appendix A**

**Minnesota Department of Natural Resources**

Ecological and Water Resources

AVIAN AND BAT FATALITY SURVEY REPORT

Project Name:_____
Project Location: _____

Company/
Organization/
Name:_____

Address: _____
_____

_____

Phone: (_____)_____-_____ Fax: (_____)_____-_____

E-Mail:_____

Project Supervisor Name:_____

Supervisor Contact: Phone: (_____)_____

E-Mail: _____

If this is contracted work, provide the name & address of the individual/organization work is being performed for:

_____
_____
_____

Form-Turbine Locations **MINNESOTA DEPARTMENT OF NATURAL RESOURCES**

10/12

**GPS Locations of All Wind Turbines**
*(Provide Lat/Lon coordinates in UTM Zone 15N NAD83)*

Project Name:_____ Page: _____ of _____

Total No. of Turbines:_____

Lat/Lon GPS Location Information for All Turbines.

DATUM used:

| Turbine No. | Latitude | | | Longitude | | | Comments |
|---|---|---|---|---|---|---|---|
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |
| | º | ′ | ″ | º | ′ | ″ | |

# Description of Wind Turbine Searched for Carcasses

**Project Name:**_____ **Turbine Number:**_____

**1. Diameter of Blade Span:** _____m

**2. Blade Height Above Ground-** Max.:_____m; Min.:_____m

**3. Surface Area of Search Plot:**_____$m^2$

**4. Attach a map of each turbine with 80 meter plot (160 m per rectangular side), search boundaries, location and numbering of transects, and vegetation classification on a separate sheet.**

**5. Attach a spread sheet with weather data collected at 60-minute intervals. Data should include wind speed, temperature, precipitation, cloud ceiling height, etc.**

**6. General Habitat Description and Topography within 100 m of Turbine:**

(Use Anderson Classification System)

**7. General Habitat Description and Topography >100m to 500m from Turbine:**

(Use Anderson Classification System)

**8. Distance of Turbine to High Value Habitat(s) (see DNR Wind Guidance document):**

Form Carcass Search 2 **MINNESOTA DEPARTMENT OF NATURAL RESOURCES**

10/12 **Daily Search Summary** **Page:** _____ **of** _____

**Project Name:**_____ *(complete each day of search)*

[a]Weather: F= fog, D= drizzle, R= steady rain, W=wind over 10mph (Use additional Pages as needed)

| | Turbine | | Time | | | Number of Carcasses Found | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Date | Number | Observer | Start | End | Weather[a] | Bat | Bird | Other | Total | Comments |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Form Carcass Search 3 **MINNESOTA DEPARTMENT OF NATURAL RESOURCES 10/12**

**Carcass Data Sheet**

**Observer Name:**_____

**Date:**_____

**Project Name:**_____

6 **Cloud Cover:**_____**% Temperature:** _____**ºC Precipitation:** _____**(fog, drizzle, rain, wind)**

| | Carcass Tag Information[a] | | | | Check One | | From Turbine | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time (h) | Turbine No. | Date | Transect No. | Specimen No. | Bat | Bird | Azimuth | Dist.(m) | Species | Age[c] | Sex[d] | Condition[e] |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

[a]Carcass Number= Turbine # - Date - Transect No. - Sequential Specimen No.; [c]Age= A (adult), J (juvenile) Unk (unknown); [d]Sex= M(male), F(female), Unk (unknown);
[e]Condition: E= excellent, F= fair, P= poor.

**Appendix B**

# MINNESOTA DEPARTMENT OF NATURAL RESOURCES

## FATALITY REPORT GUIDELINES

- Below is an outlined guide of what should be reported in the annual and final post-construction reports.
- Some general guidelines include:
  - Explain all methods used in detail.
  - If species codes are used, we recommend the American Ornithologist Union 4-letter codes (http://www.birdpop.org/AlphaCodes.htm).
  - Provide all equations and methods used for all calculations.
  - Provide average, range, confidence intervals, *p* values, and other statistics where applicable.
  - Provide raw data as Appendices or as accompanying files on a CD to the Natural Heritage Review Coordinator (651-259-5109).
- For final reports, include all years of study reporting on each individual year, as well as overall results and trends, detailing any similarities and/or difference between years of study.
- All reports should be submitted by January 1 following that years data collection. Reports need to be sent to the DNR Regional Environmental Assessment Ecologist, Natural Heritage Review Coordinator, and Energy Facilities Permitting.

1. **Executive Summary**

2. **Introduction**
   a. Description of project area
      i. Map of site including turbine locations, roads, transmission lines, substation, etc.
      ii. Distribution, number and size of turbines (height, MW, rotor swept zone, etc.)
      iii. Location of project (state, county, township, etc.)
      iv. Any other general information
   b. Habitat/landcover
      i. Landcover types – map and percentages of each
      ii. High Value habitats identified as per DNR Wind Guidance document.
   c. Wind speed
      i. Overall wind speed and direction (wind rose)
      ii. Prevailing winds from which direction and what times of the year
3. **Methods**
   a. Carcass searches
      i. Turbines & search area
         1. No. turbines searched
         2. How turbines selected
         3. Dates of survey
         4. Time of day searched
         5. Maps of each turbine's search plot delineating vegetation classes and habitat
         6. Table showing searchable area in each vegetation class for each turbine
      ii. Search methods
      iii. Incidental kills – how documented

   b. Fatality Patterns
      i. Temporal patterns - seasonal
      ii. Spatial patterns - distance from turbine
      iii. Weather and generation associations - how collected and analyzed
         1. Temperature

2. Wind speed
3. Other variables (MW, rotor sweep zone, etc.)

iv. Species, age, and gender

c. Fatality estimates and adjustment– methods used (Erickson, Manuela Huso, & others) showing all equations used
   i. Searcher efficiency trials & scavenger removal trials
      1. Searcher efficiency methods
      2. Scavenger removal methods
      3. Searcher efficiency and scavenging removal corrections (SESR) – methods and equations used
   ii. Searchable area corrections
d. Fatality and habitat (landcover) correlations

**4. Results**

a. Carcass searches
   i. Overall data
      1. Summary of search effort
         a. Average time each turbine searched
         b. # days surveys conducted
         c. Explanation why any days and/or turbines were not surveyed
      2. Bird carcasses
         a. Total No. found
         b. Breakdown by turbine
         c. Breakdown by species
         d. Breakdown by date, month, etc.
         e. Alive, injured, sent to rehab, etc.
      3. Bat carcasses
         a. Total No. found
         b. Breakdown by turbine
         c. Breakdown by species
         d. Breakdown by date, month, etc.
         e. Alive, injured, sent to rehab, etc.
      4. Maps showing carcass location at each search turbine, broken down in 10 m increments; any trends?
   ii. Temporal patterns - Seasonal distribution of fatalities
      1. Day
      2. Week
      3. Month
   iii. Spatial patterns
      1. Distance from turbines
      2. Direction from turbine (showing N, S, E, W)
   iv. Weather and generation associations
      1. Temperature
      2. Wind speed
      3. Other variables (MW, rotor sweep zone, etc.)
   v. Age, species, and gender
      1. Males vs. females
      2. Species
      3. Adults vs. juveniles
b. Fatality estimates and adjustments (see pages 6- 8 for guidance)
   i. Searcher efficiency trials & scavenger removal trials
      1. Searcher efficiency
         a. Overall searcher efficiency average and range
         b. Individual searcher average and range
         c. No. trials and searcher efficiency broken down by bat carcasses, bird carcasses, vegetation class, and date of trial

d. Fresh vs. frozen, intact vs. broken, colored vs. dull (birds), etc. and effects on searcher efficiency (if any)

2. Scavenger removal
    a. Overall average No. days before scavenger removal and range
    b. Average and range of all bat and bird scavenger removal trials
    c. No. trials broken down by bat species and bird species
    d. No. trials and mean scavenger removal broken down by bats & birds, vegetation class, and date of trial
    e. Fresh vs. frozen, intact vs. broken, colored vs. dull (birds), etc. and effects on scavenger removal time if any
    f. Scavenger removal by vegetation class
3. Searcher efficiency and scavenger removal (SESR) Corrections

ii. Searchable area corrections

iii. Fatality estimates and adjustments

1. Bats
    a. Total estimated No. of bats killed at site
    b. Bats/turbine/year include confidence interval
    c. Bats/MW/year include confidence interval
    d. Bats/$ft^2$ of rotor area/year include confidence interval
2. Birds
    a. Total estimated No. of birds killed at site
    b. Birds/turbine/year include confidence interval
    c. Birds/MW/year include confidence interval
    d. Birds/$ft^2$ of rotor area/year include confidence interval
3. Turbines with greatest/least kills
4. Other trends?

c. Correlation of fatalities and Weather data

i. Temperature

ii. Wind speed

iii. Other variables

d. Note any other trends observed

**5. Discussion**

a. Avian fatality
b. Bat fatality
c. Implications of results
d. Suggestions for improvements to protocol
e. Any recommended adjustments for this site for next year's surveys
f. If final report, discuss entire study (both years)

**6. Data sheets**

a. Fatality datasheets

i. Cover

ii. GPS location of all wind turbines

iii. Description of wind turbine searched for carcass (using Anderson Level III land cover codes)

iv. Daily Search Summary

v. Carcass Data Sheet

b. Searcher efficiency data
c. Scavenger removal data

## Section 3

# Bat Acoustic Survey Protocol for Large Wind Energy Conversion Systems In Minnesota

## Introduction

Acoustic surveys are used to collect data that is used to identify species, relative numbers of bat passes at a particular location, and facilitate the determination of risk of bat fatalities for a proposed wind project. Acoustic surveys may be recommended for projects with potential impacts to bats on a project to project basis. Recommendations will be based on the presence of stream corridors, lakes, wetlands, bat concentration areas, migratory corridors, roosting habitat, and hibernacula within or adjacent to the project area or in close proximity to proposed turbine locations. Understanding bat activity levels prior to construction of wind facilities will assist in identifying habitats and features that may pose a high risk of fatalities to bats and aid with decision-making. The data can be used to determine the overall risk level to bats, specific turbine locations that should be used for fatality searches, and during micro-siting. High numbers of bat passes or higher occurrence of migratory tree bats may result in additional recommendations. In highly problematic projects with high bat kills it may be prudent to consider curtailment or other minimization techniques.

In Minnesota there is limited acoustic and fatality data available and scant information on resident and migratory bats found in the state. Several bat species are being proposed for listing as special concern species in Minnesota and they will increase the need for acoustic data. In addition, white nose syndrome has severely impacted bat species in other states and if found in Minnesota it could result in additional fatalities and bat species listings. Information is lacking in Minnesota for bat migratory corridors, concentration areas, and habitat use for resident and migratory bat species. Additional telemetry studies are needed to improve our knowledge of bat behavior in Minnesota. Bat fatalities have been highly variable among wind energy facilities (Barclay et. al. 2007) and pre-construction acoustic surveys are routinely used to gather data to determine the need for fatality monitoring and assist in turbine siting.

Pre-construction acoustic surveys have been used on numerous projects across the country to gather bat calls that can be identified by using a call library of known vocalizations. Data is used to identify species, relative numbers of bat passes at a particular location, and facilitate estimates of the relative risk to bats from proposed wind turbines. The full-spectrum time expansion and zero-crossing detectors are the two commonly used ultrasound bat detection techniques (see Kunz et.al. 2007 for detailed discussion). The full-spectrum time expansion detector is preferred due to its ability to increase species discrimination when compared to the zero-crossing detector.

Bat acoustic data is one factor used to determine the risk level to bats as it provides baseline data for species present and activity levels within the project area. Additional factors used to determine

risk level are: potential foraging, roosting and maternity habitat in or near the project area, presence of special concern bat species, and known locations of bat hibernacula. Initial overall risk level of a project may be adjusted based on the infrastructure layout, avoidance of high risk portions of the project area, and acoustic data. However, the risk determination does not guarantee that sites with low levels of activity will result in fewer deaths than sites with higher levels of activity (Vonhof 2002).

Bat activity can be highly variable spatially and temporally (Manley et.al. 2006) and this is why acoustic data needs to be collected on individual projects. Attempting to draw correlations from acoustic data from other wind sites and applying it to unstudied sites is not recommended. Movements of bats feeding in or passing through the site should be characterized using acoustical detectors. Acoustic detectors allow researchers to detect and record calls of echolocating bats that can be used to assess relative activity and identify species or groups of species (Arnett et al. 2006).

High fatalities to bats in forested ridge tops on the east coast have been documented on numerous wind project areas. Until recently it was believed that projects dominated by an agricultural landscape would have low bat fatalities. However, in recent years some projects in agricultural dominated areas have indicated bat fatalities are higher than anticipated. Jain (2005) reported estimated fatalities at the Top of Iowa wind farm as being high when compared to other projects in the Midwest and believed their data reflects a real difference in fatality rates. The Summerview site in Alberta, Canada is an agricultural dominated landscape that has also documented high bat fatalities at 18.48 corrected annual per turbine (Barclay et al. 2007). Therefore, it is plausible that bat fatalities in agricultural dominated areas of Minnesota may be higher than expected at some wind project sites.

## Methods

The number and distribution of sampling stations necessary to adequately estimate bat activity has not been well established but will depend, at least in part on the size of the project area, variability of habitat within the project area, and whether the surveys are being conducted early in the process prior to turbine layout or are being used to assess particular proposed turbine locations. Detectors should be placed on all temporary and permanent meteorological towers for general project area information. Additional portable/temporary towers should be installed at potential high use bat habitat such as stream corridors, forested edges, lakes, or wetlands. Acoustic detectors may be needed for turbines proposed in or immediately adjacent to potential high bat use areas because habitat associated with existing MET towers may not be representative of the habitat associated with proposed turbine locations. As such, the number of bat passes and species identified could vary based on detector location within the project area. Coordination should occur early in the planning process to determine detector locations that are associated with specific habitat features that may attract higher numbers of bats to an area.

Detectors should be situated to sample as much of the rotor swept area (RSA) as possible or at least 150 feet above ground surface (NY State Department of Environmental Conservation, 2009). The location of "low" position sampling is not recommended at this time as it is unclear from existing

data whether those locations would be representative of bat activity in the rotor swept area (RSA) where fatalities occur (Jain 2005).

The predominance of bat fatalities detected to date are migratory species and acoustic monitoring should adequately cover periods of migration and periods of known high activity for resident species (U.S. Fish and Wildlife Service Land Based Wind Energy Guidelines 2012). Based on a limited amount of evidence, migration events may be highly pulsed (Grover 2009) and data collection needs to account for the variability in activity. In Minnesota, the survey period should run from April 1 through October 15. This time period is consistent with data collection on other projects as reported by Arnett (2006). This time period also coincides with known locations of migratory tree bats in Minnesota (red, hoary, and silver-haired) as reported by Cryan (2003).

Recordings at all detectors should occur daily from one half hour prior to sunset until one half hour after sunrise to correspond with bat foraging activity. Data on environmental variables such as temperature and wind speed should be collected concurrently with acoustic monitoring so weather data can be used in the analysis of bat activity levels. Detectors should be visited weekly in order to ensure the units are working properly and to recover data as this will prevent large gaps of data collection due to system failure.

On rare occasion mist netting, harp traps, and hibernacula surveys may be conducted by the DNR or be recommended. Specific methods would be required in order to ensure the proper identification, handling, and equipment sterilization techniques are adhered to. A DNR Special Permit (Scientific & Research) would be required for the qualified bat surveyor.

## Reports

Reports should be submitted shortly after data collection. A report should be submitted that includes the detailed methods: equipment used, start and end date, height of detector(s), map of detector location(s), and any other pertinent information. The reports should be specific and include calls per hour, calls per day graphed, calls by species/species group graphed, filtering parameters, percent of unverified/filtered calls, any potential relationship to high value habitat (i.e. large blocks of grassland/forest, stream corridors, wetlands, hibernacula) influences on detector location(s), influence of weather on calls, and any other pertinent information. As a minimum the report should break data into high and low frequency calls in all graphs and tables. Arnett (2006) provides a good example of the type of graphs and tables that would be appropriate for reports. Reports should be submitted to the DNR and Energy Facility Permitting (EFP) in a timely fashion. Data should also be provided to the DNR Natural Heritage Review Coordinator (651-259-5109) in electronic format for entry into various DNR databases.

## Protocol Summary

1) Detectors should be placed on all temporary and permanent meteorological towers.
2) Additional detectors (in addition to meteorological towers) should be placed in high risk areas.
3) Detectors should be positioned to capture data from the rotor swept zone.
4) Detectors should be operational from April 1 through October 15 (minimum effort).
5) Recordings should occur daily from one half hour prior to sunset until on half hour after sunrise.
6) Reports should be distributed to DNR and EFP in a timely fashion.
7) Raw Data, on disc, should be submitted to the DNR NHIS coordinator.

For detailed methods on equipment, detector deployment, and bat call analysis see Arnett (2006) or Vonhof (2002).

## References


Arnett, E.B., J. P. Hayes, and M.M.P. Huso. 2006. Patterns of pre-construction bat activity at a proposed wind facility in south-central Pennsylvania. An annual report submitted to the Bats and Wind Energy Cooperative. Bat Conservation International. Austin, Texas, USA.

Barclay, M.R., E.F. Baerwald, and J.C. Gruver. 2007. Variation in bat and bird fatalities at wind energy facilities: assessing the effects of rotor size and tower height. Can. J. Zool. 85: 381-387.

California Bat Working Group. 2006. Guidelines For Assessing And Minimizing Impacts To Bats At Wind Energy Development Sites In California. 20 pp.

Cryan, P.M. 2003. Seasonal Distribution Of Migratory Tree Bats (Lasiurus and Lasionycteris) In North America. Journal of Mammalogy: 84(s):579-593.

Grover, J. 2009. Bat Acoustic Studies for the Georgia Mountain Community wind Project Chittenden County Vermont. Western Ecosystems Technology, Inc. 22pp.

Jain, A.A. 2005. Bird and bat behavior and mortality at a northern Iowa wind farm. M.S. Thesis. Iowa State University. Ames, Iowa, USA.

Kunz, T.H., E.B. Arnett, B.M. Cooper, W.P. Erickson, R.P. Larkin, T. Mabee, M.L. Morrison, M.D. Strickland, and J.M. Szewczak. 2007. Assessing impacts of wind-energy development on nocturnally active birds and bats: a guidance document. Journal of Wildlife Management. 71:2449-2486.

Manley, P.N., B.V. Horne, J.K. Roth, W.J. Zielinski, M.M. McKenzie, T.J. Weller, F.W. Weckerly, C. Vojta. 2006. Multiple Species Inventory And Monitoring Technical Guide. USDA Forest Service, Washington. 216 pp.

New York State Department of Environmental Conservation. 2009. Guidelines for Conducting Bird and Bat Studies at Commercial Wind Energy Projects. 27 pp.

United States Fish and Wildlife Service Land-Based Wind Energy Guidelines. 2012. 72 p.

Vonhof, M. 2002. Handbook of Inventory Methods and Standard Protocols for Surveying Bats in Alberta. Alberta Sustainable Resource Development, Fish and Wildlife Division, Edmonton, Alberta. Revised 2005.


Protocol Version: October 2, 2012

## Section 4

# Avian Flight Characteristics Survey Protocol for Large Wind Energy Conversion Systems In Minnesota

## Introduction

Data on avian flight characteristics is used to determine avian use in a wind project area or in relation to proposed turbine locations. Avian use data can be used to determine if concentrated flight paths exist, if birds are flying within the rotor swept zone (RSZ), fatality risk, and species presence in the project area with an emphasis on listed species or Species of Greatest Conservation Need (SGCN). Early coordination with the Agencies (Department of Natural Resources (DNR), Energy Facility Permitting (EFP), United States Fish & Wildlife Service (USFWS) is encouraged in order to discuss the methods and determine the observation station locations. Surveys should be completed by an experienced ornithologist.

In some instances avian wetland use surveys should be conducted concurrently with avian flight characteristic surveys. This provides another opportunity to verify listed species or SGCN in the area that might not be identified at the observation stations or during other avian surveys. In addition, it provides verification to the flight characteristic data in terms of cross checking flight paths to known concentrations of avian species.

## Methods

The starting date of spring surveys is March 15 and end date June 15. The surveys are designed to start March 15 to obtain data on migratory species and continue into May and June to collect information on late migrants and breeding birds. The start date for northern Minnesota can be adjusted depending on ice out and reports on the status of migration in any given year.

Conducting spring surveys is a higher priority than fall surveys due to the potential to locate nesting listed species and the migration is more pronounced in spring than in the fall. However, fall surveys can yield valuable information that can be different than spring surveys due to changing habitat conditions, different migratory paths, and variability in prey abundance and locations. Changing habitat conditions can be the harvest/plowing of agricultural fields, fluctuations in wetland water levels, and varying use of habitat based on inclement weather conditions. Fall surveys should be conducted from August 1 through November 15. The survey period is designed to capture shorebirds and other species that migrate early and continue through the major migration period for most species. If the project area does not contain potential shorebird habitat then surveys could start on September 1.

Surveys can be conducted under variable weather conditions except when visibility is reduced to less than 600 feet due to dense fog, rain, or snow or the conditions are unsafe for the observer. Conducting surveys under varying weather conditions will provide better data concerning the birds being in the rotor swept zone as weather can affect the height of bird flight.

## Locations

The number of observation stations is determined on a project-by-project basis depending on the objectives of the data collection and potential number of flight paths. In most instances the observation stations are located at vantage points along suspected flight paths. Suspected flight paths can occur where waterfowl, shorebirds, colonial nesting birds, or other species are likely to fly among wetlands or lakes. The observation stations are located close to the area of avian concentration because that increases the likelihood of verifying a defined flight corridor. River corridors are also likely flight paths for numerous species and should be taken into account when determining the observation stations. Large stick nest building species (i.e. bald eagles, herons) can also be tracked from their nests to foraging locations. Observation station locations should be coordinated with the Agencies prior to data collection in order to target areas of concern.

All large stick nests should be identified and observed to determine species occupancy. If bald eagles are observed in the area it should be reported to the USFWS as they may have additional survey requirements under the Bald and Golden Eagle Protection Act.

## Frequency

Each observation station is surveyed 1 time per week for 1 hour per visit starting either at sunrise to 10 AM or 3 hours prior to sunset. Survey times should be alternated among sunrise and sunset for each observation station. Daily field data sheets should be included in the appendix of the Flight Characteristics Report.

Osborn et al. (1998) used 8, 10-min counts over 2 hours during each time period of morning, midday, and evening for a total of 240 minutes for each day of surveying during 1994 and 1995 in the Buffalo Ridge Wind Resource Area. Johnson et al. (2000) surveyed for large bird species on Buffalo Ridge, Minnesota using 1 hour of survey time every two weeks with ½ hour in the morning and ½ hour in the afternoon for each observation station from March 15 to November 15. Young et al. (2002) surveyed 8 observation stations for 30 minutes per station once per week over a continuous 1 year period. Two of the surveys were conducted from spring through fall and one surveyed during all seasons including winter in order to gather enough data to draw meaningful conclusions. Krych et al. (2010) surveyed for 50 minutes per station once per week from April through June using methods coordinated with the DNR.

The amount of survey time must be high enough to elucidate flight paths, birds within the rotor swept zone, and rare species presence. Based on the above references and practical experience the minimum time per observation station to gather enough data, using a short (12 week) data collection period starting March 15 is 1 hour for each observation station once per week.

## Data Collection

Binoculars are used to collect data in all directions from the observation station to approximately 1 mile for large species and less for smaller species. Data should be recorded for all birds seen with as many positive species identifications as possible. Appendix A contains an example of a data sheet that can be used during the surveys. If species identification is not possible the individuals should be recorded as unknown, but still recorded. If suspected flight paths are observed at locations too far to collect data on or determine flight paths then additional observation stations can be established. This flexibility is worked into the methods to allow for adapting data collection based on field observations.

Rangefinders and reference points are used to assist with determining distance from observation station and mapping. Meteorological towers can be used as a reference height for determining the bird height in relation to the RSZ. Observers should become familiar with estimating RSZ prior to data collection.

All avian species observed during each survey period are assigned a unique observation number. Raptors, large birds, special concern species, and listed species are plotted on a map. Flight paths are mapped and given the corresponding unique observation number. If a preliminary turbine layout is available then data should be collected on how far the bird is from proposed turbines.

## Protocol Summary

1) Spring flight path survey time is from March 15 to June 15.
2) Fall flight path survey time is from August 1 to November 15.
3) Surveys conducted under variable weather conditions.
4) Number and location of observation stations determined in consultation with the Agencies.
5) Each observation station is surveyed 1 time per week for 1 hour per visit starting either at sunrise to 10 AM or 3 hours prior to sunset.
6) Reports/results provided and discussed with the Agencies.

## Reports

The data is used to generate a report that should be provided to the Agencies and discussed prior to or during the initial turbine layouts. The report should use the common and scientific names throughout the document. If species codes are used, we recommend the American Ornithologist Union 4-letter codes (http://www.birdpop.org/AlphaCodes.htm). The report should include the following maps: observation stations, SGCN/listed species flight paths, waterfowl migration flight paths, waterfowl nesting flight paths, raptor flight paths, colonial nesting species flight paths, and other flight paths as appropriate. Figure 1 contains an example of how to map flight paths. Common generalist species (i.e. crows, pigeons) do not need to be mapped. Text associated with each map should indicate the percent of the observations with birds being within the RSZ during the observation period. Avian flight path data sheets (Appendix A) should be included as an appendix of the report. Data should also be provided to the DNR Natural Heritage Review Coordinator (651-259-5109) in electronic format for entry into various DNR databases.

## References

G.D. Johnson, W.P. Erickson, M. D. Strickland, M.F. Shepherd, D.A. Shepherd. 2000. Avian Monitoring Studies At The Buffalo Ridge, Minnesota Wind Resource Area: Results Of A 4-Year Study. Prepared for Northern State Power Company.

S. Krych, H. Kieweg, K. Champman. 2010. Assessment of Wind Energy and Avian Interactions at Whirlwind Wind Farm. Applied Ecological Services. Prior Lake, Minnesota. Prepared for Whirlwind Energy LLC.

Osborn, R.G., C.D. Dieter, K.F. Higgins, R.E. Usgaard. 1998. Bird Flight Characteristics Near Wind Turbines in Minnesota. Am. Midl. Nat. 139:29-38.

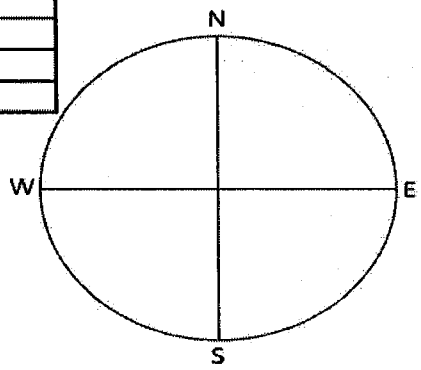
D.P. Young, W.P. Erickson, K. Bay, R. Good, K. Kronner. 2002. Baseline Avian Studies For The Proposed Maiden Wind Farm, Yakima & Benton Counties, Washington. Prepared for Bonneville Power Administration. 61 pp.

Protocol Version: October 2, 2012

Appendix A

# Avian Flight Path Data Sheet

| | | |
|---|---|---|
| Project Name/Number: | | Station: |
| Start Time: | End time: | Observer: |
| Date: | | Habitat Type: |
| Wind: | | Wind Direction: |
| Sky: | | Temp: |




**Sky**

0 = <10% Clouds
1 = >10 - 50% Clouds
2 = broken (60 - 90%)
3 = Overcast (>90%)
4 = fog
5 = rain

**Behavior**

PF = powered flight
S = soaring
P = perching/loafing
Fo = foraging
D = territorial or mating display
O = other

**Interval (Min.)**

1 = 1-20
2 = 21-40
3 = 41-60

**Notes:**

**Wind**

0 = No wind
1 = leaves barely move, 1-3 mph
2 = Leaves rustle, small twigs move, 4-7 mph
3 = Leaves, twigs in constant motion, 8-12 mph
4= Small branches move, 13-17 mph
5 = Large branches and small trees sway, 18-24 mph
6 = Large branches in constant motion, >25 mph

| # | Species | Behavior | Interval | Dir. [1] | Dist.[2] | Flight Dir. | Height (m) | Duration | Abundance | Distance to proposed turbine[3] | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | | |
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | | | | | | | | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | | | | | | | | | | | |
| 9 | | | | | | | | | | | |
| 10 | | | | | | | | | | | |
| 11 | | | | | | | | | | | |
| 12 | | | | | | | | | | | |
| 13 | | | | | | | | | | | |
| 14 | | | | | | | | | | | |
| 15 | | | | | | | | | | | |
| 16 | | | | | | | | | | | |
| 17 | | | | | | | | | | | |
| 18 | | | | | | | | | | | |
| 19 | | | | | | | | | | | |
| 20 | | | | | | | | | | | |
| 21 | | | | | | | | | | | |
| 22 | | | | | | | | | | | |

1. Direction from Observation Station.
2. Distance from Observation Station.
3. Only collected if proposed turbine locations exist during surveys.

| # | Species | Behavior | Interval | Dir.[1] | Dist.[2] | Flight Dir. | Height (m) | Duration | Abundance | Distance to proposed turbine[3] | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | | | | | | | | | | | |
| 24 | | | | | | | | | | | |
| 25 | | | | | | | | | | | |
| 26 | | | | | | | | | | | |
| 27 | | | | | | | | | | | |
| 28 | | | | | | | | | | | |
| 29 | | | | | | | | | | | |
| 30 | | | | | | | | | | | |
| 31 | | | | | | | | | | | |
| 32 | | | | | | | | | | | |
| 33 | | | | | | | | | | | |
| 34 | | | | | | | | | | | |
| 35 | | | | | | | | | | | |
| 36 | | | | | | | | | | | |
| 37 | | | | | | | | | | | |
| 38 | | | | | | | | | | | |
| 39 | | | | | | | | | | | |
| 40 | | | | | | | | | | | |
| 41 | | | | | | | | | | | |
| 42 | | | | | | | | | | | |
| 43 | | | | | | | | | | | |
| 44 | | | | | | | | | | | |
| 45 | | | | | | | | | | | |
| 46 | | | | | | | | | | | |
| 47 | | | | | | | | | | | |
| 48 | | | | | | | | | | | |
| 49 | | | | | | | | | | | |
| 50 | | | | | | | | | | | |
| 51 | | | | | | | | | | | |
| 52 | | | | | | | | | | | |
| 53 | | | | | | | | | | | |
| 54 | | | | | | | | | | | |
| 55 | | | | | | | | | | | |
| 56 | | | | | | | | | | | |
| 57 | | | | | | | | | | | |
| 58 | | | | | | | | | | | |
| 59 | | | | | | | | | | | |
| 60 | | | | | | | | | | | |
| 61 | | | | | | | | | | | |
| 62 | | | | | | | | | | | |

1. Direction from Observation Station. 2. Distance from Observation Station. 3. Only collected if proposed turbine locations exist during surveys.

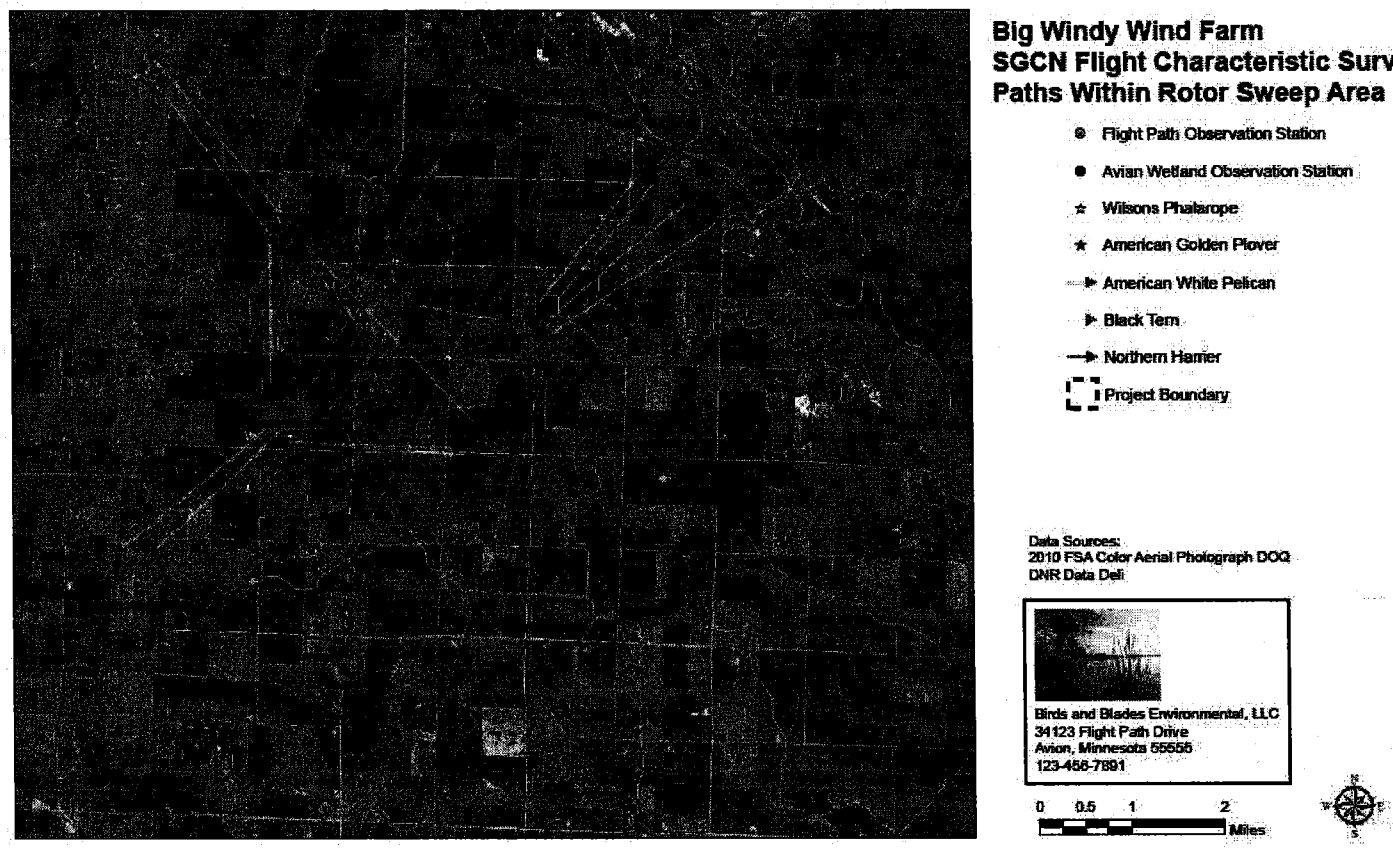

Big Windy Wind Farm
SGCN Flight Characteristic Survey
Paths Within Rotor Sweep Area
Flight Path Observation Station
Avian Wetland Observation Station
Wilsons Phalarope
American Golden Plover
American White Pelican
Black Tern
Northern Harrier
Project Boundary
Data Sources:
2010 FSA Color Aerial Photograph DOQ
DNR Data Deli
Birds and Blades Environmental, LLC
34123 Flight Path Drive
Avion, Minnesota 55555
123-456-7891
0 0.5 1 2
Miles
N
W
E
S

Figure 1

## Section 5

## Avian Grassland Survey Protocol for Large Wind Energy Conversion Systems In Minnesota

### Introduction

Grassland bird surveys are used to gather information on species presence and relative abundance within or immediately adjacent to the project area during the nesting season. Grassland bird surveys may be recommended by the Agencies (Department of Natural Resources, Energy Facility Permitting, and United States Fish & Wildlife Service) on a project by project basis. Habitat identification for surveys is based on past records of occurrence, habitat patch size(s), association among patches, and relation of the patch(s) to the project boundary. Grassland survey data is used to determine the risk level of the project, infrastructure layout, and turbines to include for fatality monitoring. Wind project infrastructure located in or adjacent to grassland habitat can result in direct habitat impacts, displacement/avoidance of habitat, and increased potential for fatalities.

Surveys should be conducted by qualified ornithologists on the DNR surveyor list that can be obtained from the Natural Heritage Review Coordinator (651-259-5109). Coordination concerning the surveys should occur early in the process to identify the habitat to be surveyed. Conducting the surveys early in the process allows for the avoidance and minimization of impacts and reduces the likelihood of infrastructure (turbines, access roads, substations, collector lines) layout changes later in the process.

All species identified are recorded; however, the emphasis is to locate Species of Greatest Conservation Need (SGCN) and state or federal listed species. The surveys are used to gather additional data to determine the continued species existence at past locations and find new locations. Some grassland species like the upland sandpiper (Mixon 2006) and short-eared owl (Mixon 2004) require different methods to achieve an increased likelihood of detectability and those methods will be outlined by the Agencies on a project by project basis. Coordination with the Natural Heritage Review Coordinator is required as they may recommend additional species specific survey methods for some species. Observation of non-grassland species are recorded during the surveys to include any raptor nests observed during the surveys or while at other locations within the wind project area.

Most listed grassland species are more habitat specific and require larger blocks of habitat for nesting. Surveys for grassland species should be concentrated in the larger blocks of habitat or areas with past records of species presence. Typically, surveys are conducted on public land, Conservation Reserve Program, Reinvest In Minnesota, prairie, or other areas that are less disturbed and fragmented. The DNR recommends that surveys be focused on potential habitat for SGCN and state or federal listed species. General point counts along roads and disturbed areas (i.e. farm fields) are usually not a valid method, when used alone, for determining the presence of listed species. General point counts along roads typically provide a list of generalist avian species that use fragmented habitat. The Agencies will identify potential habitat, in consultation with the project proponent, that should be surveyed. Under some circumstances, the Agencies may not recommend species surveys if potential habitat is avoided and an appropriate buffer is applied.

When assessing data in relation to project infrastructure it is important to note the impacts are not limited to project infrastructure located within grassland. Infrastructure located adjacent to the grassland habitat can result in fatalities or habitat avoidance. Following are common scenario's that result in grassland species utilizing habitat adjacent to secure nesting cover or throughout a project area:

* When grassland birds arrive in the spring they are migrating into the area and moving among patches of potential nesting habitat and that may put them in contact with turbines. The risk may be even greater to first year nesting birds as they tend to investigate more areas as potential nesting habitat when compared to pairs that were successful in prior years and have developed site fidelity.

*Prior to migration, in late summer/early fall, the adults and young of the year will begin to disperse from nesting habitat to various patch sizes of grasslands, wetlands, and agricultural fields in the area. The increased activity and dispersal increases the fatality risk due to a greater likelihood of birds being within the turbine rotor swept zone.

*Many grassland birds nest several times during a breeding season and can relocate to other fields for nesting, especially if a nest has been destroyed by predators, mowing, grazing, or plowing. The movement among habitat patches may increase fatality risk.

In order to assess potential impacts to grassland birds specific survey methods are needed in order to determine their presence/absence in nesting habitat, determine the avian risk level, use in micro-siting, and provide information on the need for fatality searches.

## Methods

Grassland bird species are surveyed using transects in large blocks of un-fragmented grassland habitat during the nesting season. The number of transects are determined on a project by project basis and are established to have full coverage of the grassland habitat. Transects are established, relocated, and followed using GPS units with pre-recorded waypoints. Generally the transect covers 75-meters (m) either side of the transect line for a total width of 150-m. Transects are spaced approximately 250–m apart and 150-m from the edge of a habitat. In very large blocks of grassland the number and spacing of transects may need to be adjusted. Observer's record observations for 100-m segments along each transect. For each 100-m segment the observer walks slow enough to hear and see birds. The observer stops for 5 minutes at the beginning and end of each 100-m segment to listen and spot birds.

Three surveys are conducted, from 15 minutes prior to sunrise to 10 AM, with one survey occurring during the last week of May, first week of June, and third week in June. Surveys are timed to coincide with the most active period within the nesting season for most grassland species. Conducting surveys outside of these dates may produce unreliable data that may not be accepted by the Agencies. Surveys are only conducted in weather favorable to hearing and seeing the species (low wind <10 mph, no rain).

In addition to the species observed (call or visual) and location, the following data are recorded for each transect survey: Date, start and end time of observation period, transect number, number of individuals, distance from observer, behavior, first altitude above ground, flight direction, and weather (temperature, wind speed, wind direction, precipitation, and cloud cover).

Recommended methods are a combination of techniques used by the Pennsylvania Game Commission (2007), Minnesota County Biological Survey (2010), Graham Environmental Services Inc. (2009), and Western Ecosystems Technology Inc. (2008).

## Protocol Summary

1) Identification of habitat to be surveyed and establishment of transects.
2) Three surveys during last week of May, first and third week of June.
3) Surveys are conducted from 15 minutes prior to sunrise to 10 AM.
4) Transects are spaced approximately 250 –m apart and 150-m from the edge of a habitat. Observer's record observations for 100-m segments along each transect. The observer stops for 5 minutes at the beginning and end of each 100-m segment.

## Report

Further coordination with the Agencies regarding survey results should occur to determine if additional avoidance and minimization are needed. A final survey report that includes proposed avoidance and minimization measures should be generated and provided to the Agencies. The surveys and final report should be completed early in the site planning stage of the project. If species codes are used, we recommend the American Ornithologist Union 4-letter codes (http://www.birdpop.org/AlphaCodes.htm).The report should include the following maps: habitat patches surveyed and transect locations, locations of SGCN/listed species, grassland bird concentration areas, raptor observations and general flight paths, and other maps as appropriate. Common generalist species (i.e. crows, pigeons) do not need to be mapped. Grassland survey data sheets should be included as an appendix of the report. Text of the report should discuss species known to avoid turbines or access roads, fragmentation of habitat, proximity of turbines to surveyed habitat patches, and any other relevant information. Data should also be provided to the DNR Natural Heritage Review Coordinator (651-259-5109) in electronic format for entry into various DNR databases.

In some instances avian wetland use surveys should be conducted concurrently with grassland bird surveys. Avian wetland use surveys provide another opportunity to verify listed species or SGCN in the area that might not be identified during the grassland bird surveys or during other avian surveys.

## References

Graham Environmental Services, Inc. 2009. Oak Glen Wind Farm Project Loggerhead Shrike and Henslow's Sparrow Surveys. Prepared for Merjent, Inc.

Minnesota County Biological Survey. 2010. Breeding Bird Survey Methods. 1 p.

Mixon, K.L. 2006. Upland Sandpiper's The Environmental Review Process for Pennsylvania. Pennsylvania Game Commission. Harrisburg, Pennsylvania. 12 pp.

Mixon, K.L. 2004. Pennsylvania Game Commission Short-Eared Owl Survey Protocol. Pennsylvania Game Commission. Harrisburg, Pennsylvania. 1 p.

Pennsylvania Game Commission. 2007. Protocols to Monitor Bird Populations at Industrial Wind Turbine Sites. Commonwealth of Pennsylvania. Harrisburg, Pennsylvania. 17pp

Western EcoSystems Technology, Inc. (WEST). 2008. Wildlife Studies for the Bitter Root Wind Resource Area Yellow Medicine and Lincoln Counties, Minnesota. Bismarck, North Dakota. Prepared for Buffalo Ridge Power Partners, LLC. 62 p.

Protocol Version: October 2, 2012

## Section 6

## Avian Wetland Use Survey Protocol for Large Wind Energy Conversion Systems In Minnesota

### Introduction

Avian surveys of large lakes or wetlands, with an open water component, are used to establish the presence and relative numbers of avian species within or in close proximity to the project area. The surveys are designed to identify Species in Greatest Conservation Need (SGCN), listed species (state or federal), avian concentrations, species not identified during other survey efforts, and assist with determining project risk level to avian species.

The wetlands surveyed should be coordinated with the Agencies prior to data collection. Note that these surveys are not designed to be conducted for all wetlands, but only the large open water lakes or wetlands that can be surveyed with a reasonable amount of effort. The survey effort is designed to be efficient and limited in scope. In many instances the wetland use surveys can be conducted on the same days as flight path characteristics or grassland bird surveys. When avian use surveys are conducted in combination with avian flight characteristic surveys the data can be used to cross check flight paths to known concentrations of avian species.

### Methods

Wetland use surveys should be conducted a minimum of three times from March 15 through June 30. The surveys should be spaced a minimum of 4 weeks apart to cover various migratory periods and early nesting. Each survey should last for a minimum of 60 minutes.

Surveys should be conducted during favorable weather conditions that allows for the observation of open water areas that can be glassed at a distance. Surveys should be conducted from sunrise to 10 AM or 3 hours prior to sunset. If these surveys are being conducted on the same day as the flight characteristic methods then survey times can be flexed outside of the preferred survey times. The flexibility allows for data collection to be conducted on the same day as other surveys.

### Reports

Reports should be provided to the Agencies that include the species, species status (SGCN or listing), number of individuals observed for each survey period for each wetland, map of survey locations and any observed flight paths. If species codes are used, we recommend the American Ornithologist Union 4-letter codes (http://www.birdpop.org/AlphaCodes.htm). Data should also be provided to the DNR Natural Heritage Review Coordinator (651-259-5109) in electronic format for entry into various DNR databases.

Protocol Version: October 2, 2012

## Equal Opportunity Statement

Equal opportunity to participate in and benefit from programs of the Minnesota Department of Natural Resources is available to all individuals regardless of race, color, creed, religion, national origin, sex, marital status, public assistance status, age, sexual orientation, disability or activity on behalf of a local human rights commission. Discrimination inquiries should be sent to Minnesota DNR, 500 Lafayette Road, St. Paul, MN 55155-4049; or the Equal Opportunity Office, Department of the Interior, Washington, D.C. 20240.

Alternative Format Available Upon Request.



## Document Citation

Mixon, K.L., J. Schrenzel, R. Doneen, L. Joyal, N. Kestner, M. Doperalski, and J. Schladweiler. 2012. Avian and Bat Survey Protocols For Large Wind Energy Conversion Systems in Minnesota. Minnesota Department of Natural Resources. New Ulm, Minnesota. 47 p.

## O'Reilly, Ann (OAH)

**From:** Barb Stussy <barbstussy@hcinet.net>
**Sent:** Saturday, December 22, 2012 9:44 AM
**To:** *OAH_Routecomments.oah
**Subject:** COMMENTS--Commission Docket No. E-999/M-12-360 and OAH Docket No. 65-2500-30183
**Attachments:** 12 21 12 Comments for Power Plant Siting and Transmission Line Routing Annual Hearing mailing copy.pdf

**Importance:** High

Attached in pdf format are my comments for the 12/21/12 Power Plant Siting and Transmission Line Routing Program Annual Hearing

Barbara A. Stussy
14884 420th Street
Zumbrota, MN 55992
507-732-5115
barbstussy@hcinet.net

"one voice can become many"

EXHIBIT
tabbies 14

December 21, 2009

The Honorable Ann O'Reilly
Office of Administrative Hearings
PO Box 64620
St. Paul, MN 55164-0620

Re: Commission Docket No. E-999/M-12-360 and
OAH Docket No. 65-2500-30183

Dear Judge O'Reilly:

I am submitting the following comments:

1. On May 22, 2009, the Minnesota Department of Health (MDH) Environmental Health Division issued the white paper entitled, "*Public Health Impacts of Wind Turbines.*" The white paper was prepared by the MDH in response to the Department of Commerce Office of Energy Security (OES) request to evaluate possible health effects associated with low frequency vibrations and sound, and shadow flicker arising from large wind energy conversion systems (LWECS).

   Burl Haar, Executive Secretary, Minnesota Public Utilities Commission issued a Notice of Comment Period on July 21, 2009, "In the Matter of the Commission Investigation into LWECS Permit Conditions on Setbacks and the Minnesota Department of Health Environmental Health Division's White Paper on Public Health Impacts of Wind Turbines." That comment period ran through September 16, 2009. The MPUC eDocket 09-845 was established to gather comments and information. To date, this eDocket remains open—over three years from the Notice of Comment Period—and information continues to be added.

   Within the MDH white paper, it reads, "Low frequency noise from a wind turbine is generally not easily perceived beyond ½ mile. However, if a turbine is subject to aerodynamic modulation because of shear caused by terrain (mountains, trees, buildings) or different wind conditions through the rotor plane, turbine noise may be heard at greater distances".

   Based on this last quote, why does the MPUC continue to site wind turbines closer than ½ mile from peoples' homes?

   Also, this MDH white paper recommends "potential impacts from shadow flicker and turbine visibility should be evaluated." Has this been done?

   Of what value is the depository of comments if someone is not extracting some value from this information? Many new scientific studies relating to low frequency noise and shadow flicker have been released since 2009, and the number of large wind energy conversion systems (LWECS) in Minnesota and across the U.S. has increased.

Perhaps it is time for the Minnesota Department of Health to revisit and update the public impacts of wind turbines . Better yet, I would suggest that the MPUC use the MDH recommendation to site industrial wind turbines at least ½ mile from peoples'
homes when approving future industrial wind development in Minnesota. It is time for Minnesota to take a lead in responsible siting of wind turbines.

2. Todays' Power Plant Siting and Transmission Line Routing Program Annual Hearing is scheduled for 1 PM on Friday, December 21, 2012. This is the afternoon leading into the Christmas Holiday weekend. The fact that this is scheduled when many are extremely busy with holiday preparations does not show any reasonableness. My recommendation is that this annual hearing be scheduled in January for the previous year review. Setting a date very near a holiday is ludicrous. The year 2012 is not over yet, and waiting until January is appropriate and reasonable.

Thank you for allowing me to comment.

Barbara Stussy
14884 420th Street
Zumbrota, MN 55992
barbstussy@hcinet.net
507-732-5115

## O'Reilly, Ann (OAH)

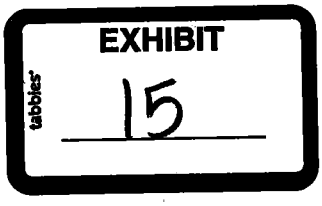
**From:** Caraway57@aol.com
**Sent:** Friday, February 01, 2013 10:22 AM
**To:** O'Reilly, Ann (OAH)
**Subject:** OAH #65-2500-30183. PPSA Annual Hearing 2013-comment
**Attachments:** PPSA Annual Hearing 2012.pdf

Dear Judge O'Reilly,

Thank you for hearing my oral comment at the Annual PPSA Hearing December 21, 2012.
Attached is my written comment.
Thank you for your attention.

Respectfully,
Suzanne Rohlfing





February 1, 2013

The Honorable Ann O'Reilly
Office of Administrative Hearings
PO Box 64620 St. Paul, MN 55164-0620

Suzanne Rohlfing
2310 15th Ave NW
Rochester, MN 55901

RE: Commission Docket # E-999/M-12-360
OAH Docket # 65-2500-30183

Dear Judge O'Reilly,

Thank you for the hearing my comment at the 2012 Annual PPSA Hearing. I consider it a privilege handed down by Statute. I consider it an obligation, having fully participated in a large HVTL Docket: #TL-09-1448, better known as CAPX2020.

I submit my oral and written comment as a Minnesota citizen.

I would like to highlight the directive of the PUC. Chapter 216.E – ***"The commission's site and route permit determinations must be guided by the state's goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state's electric energy security through efficient, cost-effective power supply and electric transmission infrastructure."***

I would also like to include the MN Statute:

- 116D.03 subd 2. (5): Action by state agencies- ***"Duties include recognizing the worldwide and long range character of environmental problems and, where consistent with the policy of the state, lend appropriate support of initiatives , resolutions and programs designed to maximize interstate, national and international cooperation in anticipating and preventing a decline in the quality of the world environment"***

Minnesota is being bombarded with energy projects. HVTL, Wind, and Silica Sand mining. These projects threaten and compromise the "preservation of the environment". The Commission has been appointed to balance energy reliability **and environmental preservation**. It concerns me that in some dockets, even with USFWS and MN NDR input, sensitive environmental issues appear to be in the background. There are "guidelines" set forth by the PUC, and not enforceable mandated criteria.

The globe is facing astronomical change. Climate. All aspects of our economy and environment will be challenged. Water supply and purity, air quality, soil, habitat, everyday life. How will we be prepared? Changes will come fast. Decisions we make in Minnesota will have long term consequences and will impact the programs and initiatives of conservation and preservation outside of this state.

I ask that the Commission utilize its powers to keep these concepts in the forefront of decision making. Long term sustainability as opposed to short term gain and profit. Local/regional reliability and benefit versus Fortune 500 company plan and profit and short sighted business propositions.

I ask that the Commission hear the voice of the citizen. Who drives the energy future? And what does that look like? What kind of society do we want? These questions were raised at a recent presentation in Rochester, hosted by MN State Sen. Senjem, and moderated by Comm. Boyd., "A Minnesota-German Dialogue on Best Practices". Dr. Harry Lehmann, who heads the division for environmental planning and sustainable strategies at Germany's Federal Environment Agency (UBA) shared this and other thought provoking concepts: Co-generation of power and heat, **local and regional coops**, utilizing existing technology- efficiency and renewable integration. He suggested that we will have the energy, but **the challenge will be the resources**.... So how will Minnesota combine energy consumption and conservation?

Another presenter, Mr. Werner Frohwitter, spoke of wind farms as part of the renewable plan. He stated that they "learned from their mistakes". Setbacks for commercial turbines from dwellings were 3,000 ft. Minimum! He also stated that if there was a conflict with bird habitat, there would be no wind farm placed at such a place. As the Commission faces difficult permitting decisions, I urge them to set an example to the rest of the country, and be proactive in identifying misguided or dishonest business incentives and poorly chosen sites for projects. Instead of relying on past or loosely applicable data to make decisions, let's ask for the needed, pertinent and current studies BEFORE decisions are made.

I am disgusted with the national media suggesting that we will have natural gas energy sources "for the next 100 years", and know that this energy is and will be exported. It was stated to the Commission, in the large hearing room in November 2011, that America is to be the #2 exporter of natural gas within the decade. This sounds like exploitation and nothing like security and conservation. Please keep in mind that Minnesota "gold" that awaits unprecedented industrial mining, with no state oversight, no state Environmental Assessment, and small government entities left to fend for themselves. In a time where energy has substantial power (no pun

intended) and a rapidly changing face, your responsibility to preserve the constitution of Minnesota is incredible. Please remember the BOTH weights of the scale.

It is time to think outside of the box, everyone. As the PUC solicits comment from the public, and considers consolidating MN Rules Chapters 7849 and 7850, I am concerned that faster may be aligned with better. I witnessed the Wisconsin process for the CAPX Project. It was more difficult for citizen participation. It takes time for folks to engage. Although combining need and siting will no doubt promote the utilization of more current data, I fear it may push the process along, missing key points needed to make the best decision. Or as Comm. O'Brien has said, to "do the right thing". In the Capx2020 Docket, a key piece of information was missing from the EIS, not corrected by the Applicant, and led to a misinterpretation by the ALJ. This information was presented by a citizen group. I appreciate the PUC request for an open Advisory Committee on this matter.

I ask that the Commission add the word "citizen" to the Advisory Task Force. Folks on site know the land. Sometimes, local governments do not participate when solicited, for various reasons. I ask that the Commission continue to support continued dialogue with citizens, transparency of information from all agencies, and encourage thinking "outside of the box". As noted in a case before the MN Supreme Court, Buy the Farm, the citizens were grossly misled into believing in statute that was written to protect them from the unwanted but inevitable intrusion of a large energy project. Now the Fortune 500 company is attempting to "buy the decision" to disregard legislation.

The organized and peaceful outcry of citizens on certain projects here in Minnesota suggests that it is important enough to participate, learn and contribute to the energy future. Responsibly, with conscience and common sense: sensible siting, conservation initiatives, serious discussion and implementation of carbon credit and taxation, resource preservation. And where the voices are loudest, the barometer reflects heightened concern. NOT ALL PROJECTS ARE OK TO BE PERMITTED.

If peaceful, thoughtful and collaborative decisions are to be made through Process, statute and legislation must be interpreted as intended, and the people must realize that they have been heard, and that decisions are well founded in the criteria set forth by the state. Minnesota can, and has the opportunity, to lead this nation in setting an example of a responsible, reliable and sustainable future.

I thank the Commission for its thoughtful consideration of criteria when making impactful decisions. It is important to witness the discussion before the public, and choices based on these criteria that we, the public, rely on for a just decision making process. The criteria and reasons for each decision must be CLEARLY sited. The citizen is not compensated for the countless hours, time off work, money, and investment he/she makes in process participation. Some citizen always loses.... His home, the future as he envisioned it. It is disheartening to hear a Commissioner state

"I don't care either way" when it is his/her appointment to care. That citizen has cared enough to participate in a daunting process. Not only for himself, but hopefully for the greater good, for the "right thing".

Lastly, I want to acknowledge the people that put in the time, do the work, look for the answers, and believe in this "better" future. Be you commissioner, judge, attorney, policy maker, agency professional....or citizen.

Respectfully submitted,

Suzanne Rohlfing

2310 5th Avenue NW
Rochester, MN 55901
caraway57@aol.com

January 15, 2012

The Honorable Ann O'Reilly
Office of Administrative Hearings
PO Box 64620
St. Paul, Minnesota 55164-0620



RE: No. E-999/M-12-360, OAH Docket No. 65-2500-30183

Judge O'Reilly:

We are interested in commenting on the siting of large electric generating power plants and routing of high-voltage transmission lines, in reference to the Hollydale Power Line Project, which is near our home.

It is understood that the ever-growing need for electricity by consumers through usage and housing expansion is a legitimate need for new or expanded power plants and transmission lines. However, it is critical that tax-paying citizens of a community have a strong say in how those services will be delivered when it impacts them so greatly.

People buy property based on its ability to fulfill their needs, as well as the setting around them – the parks, the schools, golf courses, shopping and other amenities, nature trails, and wetlands. In fact, they pay a premium for these properties, and enjoy a discount for the same house if it is near a dump, a power plant, a railroad track, or a highway. This is their choice, and they expect that this long-term, high-cost investment is made with a fair level of certainty about that setting. Real estate is often people's primary and most expensive asset.

Eminent domain is reserved for the taking of private property for the public good, and people are at least compensated when this occurs. Zoning changes or unexpected changes to the setting around a person's property offer no such benefit, and so should be considered very carefully with the good of the community in mind.

As a rule, it would seem that existing personal property should NOT be impacted by new large power plants or high-voltage transmission lines, and that, when they are required, unused, raw land should be utilized for this purpose. Otherwise, existing property values decline and home-buyers become uneasy about buying in a community with such an unknown having the ability to greatly impact their nest egg.

It is our hope that the Hollydale transmission project will be routed with the LEAST intrusion to existing homes as possible.

Thank you,

Kirsten and John Busse
16827 49th Pl N
Plymouth, MN 55446

**O'Reilly, Ann (OAH)**

**From:** Doug McKibben <doug_mckibben@yahoo.com>
**Sent:** Thursday, January 31, 2013 4:07 PM
**To:** *OAH_Routecomments.oah
**Subject:** Dockets E-999/M-12-360 and 65-2500-30183

The Honorable Ann O'Reilly
Office of Administrative Hearings
PO Box 64620
St. Paul, Minnesota 55164-0620

E-999/M-12-360 and 65-2500-30183

Please accept these comments as part of the POWER PLANT SITING AND TRANSMISSION LINE ROUTING PROGRAM ANNUAL HEARING.

Great River Energy is well underway with the site work associated with building a new substation (to be named the Chub Lake substation) instead of expanding the existing Lake Marion substation as authorized by the 08-1474 project route permit. The route permit at Section II.B.8 provides for the construction of four new substations (Hazel Creek, Cedar Mountain, Helena, and Hampton) and the upgrade and expansion of four existing substations (Lyon County, Minnesota Valley, Lake Marion, and Franklin). The route permit appears to only authorize the expansion of the existing Lake Marion substation and not the construction of a new substation. This is a pretty significant change in the project with respect to landowners near the substation site and the fact that GRE is attempting to use this change in project scope to justify a realignment of the line as it approached from the west. There are many landowner impacts arising adjacent to the substation site and in the vicinity of the approaching alignment as a result of GRE's failure in performing the due-diligence and planning that was expected of them for the expansion of the Lake Marion station.

**Why has there not been some formal process, review/approval for GRE's actions to simply start building a new substation? If there has been, there is no record of that in the public documents filings. At a minimum, the substation construction change seems to qualify for a minor alteration review and approval process.**

**Why does the process allow GRE to make significant changes in alignments in the 11th hour of the project?** People have planned their homes, families/lives and financial security based on GRE's public plan that's been available for years. And noww. People who accepted the fact that the 345kv would be 1/4 mile away and chose to stay in their homes are now dealing with GRE's attorneys because their properties are being condemned as a result of a monstrous 185' tall pole planned for 75' from their front door, not 1/4 mile away. It's an ambush of sorts driven by GRE's preferences and it's a big impact on human settlement.

**D. McKibben**

## O'Reilly, Ann (OAH)

**From:** Michelle Sandstrom <msandstrom@frontiernet.net>
**Sent:** Saturday, January 26, 2013 3:19 PM
**To:** *OAH_Routecomments.oah
**Subject:** Commission Docket No. E-999/M12-360 and OAH Docket No. 65-2500-30183

The Honorable Ann O'Reilly
Office of Administrative Hearings
P.O. Box 64620
St. Paul, MN 55164-0620

Dear Judge O'Reilly,

I am writing regarding Commission Docket No. E-999/M12-360 and OAH Docket No. 65-2500-30183. My family has been unfairly impacted by decisions laid out by the Public Utilities Commission. The PUC did not at all follow the guidelines that were set up for the routing of the 345kV line running from Hampton to Rochester, specifically for the section through Cannon Falls labeled as the Modified Preferred Route.

Long after the Environmental Impact Statement (EIS) was complete and the comment period was over, Xcel was allowed to change the route and enter information in the EIS appendix with absolutely no time for evaluation or comments by the public, DNR, DOT, nor any other agency. The new routing runs through the middle of our property, very near our home and small business, as well as many other homes that were not included in the house counts submitted by Xcel in the appendix. We petitioned for correction of the house counts, but were told the comment period was over. Xcel was able to enter information in the EIS appendix, but no one else was.

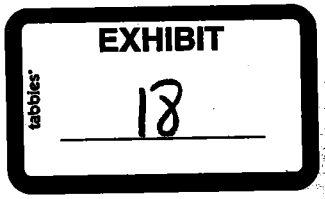
The Department of Commerce (DOC) also gave unfair advantage to Xcel. In fact, the lead DOC person on this project, Matt Langan, took a position with Xcel just days after our appeal to the PUC. Matt Langan was the primary person convincing the PUC that our area was a commercial corridor, which it most certainly is not, it is all zoned Residential A3. The Administrative Law Judge, after her thorough review of the project, did not recommend our route. She carefully reviewed the information and decided route P-003 was the best alternative. Matt Langan "corrected" her information with fabricated material, saying there were fewer houses (not true-house counts were done by no one except Xcel and were totally incorrect), and that the area was commercial (not at all true, the line would run along the scenic Cannon River, through my horse pasture, and past a residential neighborhood). The DOC report was also an example of very sloppy work. There were places where the DOC referred to routes that didn't exist or were on the other side of Rochester. Maps were labeled incorrectly, and the DOC referenced house counts that were not in the EIS.

The PUC also refused to allow our lawyer to present our case during the PUC appeal meeting. They cited the DOC information as a primary reason for their decision, even though the DOC information was not taken out of the EIS and was full of misleading "facts" and sloppy work. After paying a lawyer a great deal of money, it was very disconcerting that the PUC did not want to listen to our appeal. The whole meeting lasted about 30 seconds.

I hope that on future projects, the DOC and the PUC are held accountable to fair process, which was certainly not the case for this routing segment. Thank you for your consideration.

Respectfully,

Michelle Sandstrom



## O'Reilly, Ann (OAH)

**From:** Shelley <nygaard228@sleepyeyetel.net>
**Sent:** Friday, February 01, 2013 12:48 PM
**To:** *OAH_Routecomments.oah
**Subject:** The Honorable Ann O
**Attachments:** The Honorable Ann O.pdf



EXHIBIT
tabbies
19

**The Honorable Ann O'Reilly**

**Office of Administrative Hearings**

February 1, 2013

Re: Commission Docket# E-999/M-12-360
OAH Docket# 65-2500-30183

Your Honor,

I am commenting to this Annual Power Plant Siting docket to request that Large Wind Energy Conversion Systems that fall under statute 216 be included under the Power Plant Siting Act.

Currently these large electrical power plants do not get included under an annual hearing of public comment. Large Wind Energy Conversion Systems are producing electricity, are considered in MISO, use public utilities power lines, are governed by the Minnesota Public Utilities Commission at public expense and electric utilities are required to purchase wind power.

These Large Wind Energy Conversion Systems are having an impact on the public both financially and environmentally. Again I request that Large Wind Energy Systems no longer be exempt but rather be included under the Power Plant Siting Act.

Thank You for Your Consideration. Respectfully,

Rochelle Nygaard
12110 355th St
Goodhue MN 55027
651-258-4333