

**OFFICE OF RENEWABLE ENERGY SITING**

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In the Matter of the Application of  
Heritage Wind, LLC for a Permit for a  
Major Renewable Energy Facility  
Pursuant to Section 94-c of the New York  
State Executive Law to Construct a  
184.8 MW Wind Energy Facility located  
in the Town of Barre, Orleans County.

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Case No.: 21-00026

**DIRECT TESTIMONY OF  
DANIEL ROSENBLATT, Ph.D. AND HEIDI KENNEDY**

Division of Fish and Wildlife  
New York State Department of Environmental Conservation  
On Behalf of the Office of Renewable Energy

October 14, 2021

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*On behalf of:*

*On behalf of:*

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**WITNESS INTRODUCTION**

**Q. Will the first witness please state his name, employer, title and business address?**

A. My name is Daniel Rosenblatt. I have been employed by the New York State Department of Environmental Conservation (NYSDEC or Department) in the Division of Fish and Wildlife, Bureau of Wildlife for approximately 22 years. I currently work as a Wildlife Biologist in charge of the Wildlife Diversity Section in NYSDEC’s Central Office, Albany, New York.

**Q. Will the first witness please describe his educational background and professional certifications?**

A. Please see a copy of my resume, attached as Exhibit ORES-RK-1.

**Q. Will the second witness please state her name, employer, title and business address?**

A. My name is Heidi Kennedy. I am employed by the NYSDEC in the Division of Fish and Wildlife, Bureau of Wildlife as a Wildlife Biologist. I have been in this position for approximately 18 years. I began working for the NYSDEC in 2001 as a Habitat Biologist in the Division of Fish and Wildlife, Bureau of Ecosystem Health (formerly known as the Bureau of Habitat), and I moved to my current position in 2003. I currently work in the NYSDEC Region 8 Iroquois sub-office, 1101 Casey Road, Basom, New York.

**Q. Will the second witness please describe her educational background and professional certifications?**

1 A. Please see a copy of my resume, attached as Exhibit ORES-RK-2.

2 **Q. Will the witnesses please summarize their collective responsibilities at the**  
3 **Department related to Article 11 of the Environmental Conservation Law?**

4 A. As Wildlife Biologists, we assist in the programmatic oversight for the State's  
5 statutory and regulatory Threatened and Endangered (T&E) Species programs. In this  
6 capacity, we oversee the implementation of Article 11 of the Environmental Conservation  
7 Law (ECL) (Article 11), including the New York Endangered Species Act (Article 11 –  
8 0535) and its implementing regulations set forth in Part 182 of Title 6 of the Official  
9 Compilation of Codes, Rules and Regulations of the State of New York (6 NYCRR) (Part  
10 182). Included in this is the review of: Part 182 permit applications, compliance with the  
11 requirements of Article 11 and Part 182 and other relevant requirements for protected  
12 wildlife for projects reviewed under Section 94-c of the New York State Executive Law  
13 (94-c), as well as those reviewed under Article 10 of the Public Service Law (Article 10),  
14 and the Department's assessment of potential and realized impacts to birds and bats at wind  
15 and solar energy projects.

16 In addition, we have programmatic oversight for the State's protected species  
17 defined as protected wildlife under the ECL (Article 11 – 0103), with a prohibition against  
18 take, except as permitted by the fish and wildlife law (Article 11-0107). Protected wildlife  
19 includes all migratory birds in addition to T&E species and game species.

20 **Q. Will the first witness please summarize his experience regarding species**  
21 **protected under Article 11, and review of proposed wind energy projects?**

1 A. Since being hired by DEC as a Biologist in 1999 to run the Long Island Endangered  
2 Species Program out of the Region 1 Stony Brook office, review of projects for potential  
3 impacts to listed species and other protected wildlife resources has been one of my  
4 professional responsibilities. I was involved with the review of one of the first offshore  
5 wind proposals at Plum Island in 2005. Since 2007, I oversee all Bureau of Wildlife  
6 programs pertaining to the conservation of terrestrial wildlife, with the exception of those  
7 species commonly pursued as game. This includes the entire array of terrestrial T&E  
8 wildlife. As part of that oversight, I work with staff to develop management strategies for  
9 restoring, recovering and protecting species and implement monitoring and management  
10 programs for all protected wildlife including migratory birds. Part of my role in protecting  
11 listed species is assisting in the review of projects that may adversely impact listed wildlife,  
12 including proposed wind energy projects pursuant to 94-c and Article 10.

13 **Q. Will the second witness please summarize her experience regarding species**  
14 **protected under Article 11, and review of proposed wind energy projects?**

15 A. As a Wildlife Biologist specializing in non-game birds, I am responsible for  
16 reviewing projects with potential impacts to T&E species, primarily marsh birds and  
17 grassland birds, in NYSDEC Region 8. I have reviewed several wind energy and other  
18 development projects to evaluate impacts to wildlife and their habitats, including State-  
19 listed T&E birds and their nesting, foraging, and wintering habitat. Impacts to other  
20 protected species such as migratory birds and game species are also considered during the

1 review process. My review has included projects reviewed pursuant to 94-c, as well as  
2 those reviewed under Article 10 and New York's State Environmental Quality Review Act.

3 I am also responsible for the management of Oak Orchard, Tonawanda, Braddock  
4 Bay, and John White Wildlife Management Areas (WMAs). As part of this work, I have  
5 planned and coordinated extensive habitat management and restoration projects to benefit  
6 a variety of species, including listed species, as well as other migratory species such as  
7 waterfowl, songbirds, and shorebirds. The WMAs I manage are all part of key stopover  
8 sites, so habitat management and restoration work is often geared, at least in part, toward  
9 providing migratory habitat.

10 In addition, I am a member of the Department's Grassland Bird Conservation  
11 Strategy Team and the Bird and Mammal Diversity Team's Grassland Bird sub-team. As  
12 part of these teams, I have worked on planning efforts for grassland bird conservation in  
13 the State, developing protocols for conducting surveys targeting State-listed breeding and  
14 wintering grassland bird species, and developing best management practices for managing  
15 grassland habitats on State WMAs. I am also part of the Department's Marsh Bird and  
16 Colonial Waterbird sub-teams.

17 **Q. Please describe the subject matter of this proceeding.**

18 A. On March 15, 2021, the Office of Renewable Energy Siting issued a Draft Permit  
19 for a Major Renewable Energy Facility (Draft Permit) to Heritage Wind, LLC (Applicant)  
20 for a proposed 33-turbine, 184.4 MW wind facility (Facility or Project) in the Town of  
21 Barre, Orleans County (DMM Item No. 25). The Draft Permit was issued by the Office

1 pursuant to New York State Executive Law §94-c and the Office's regulations at 19  
2 NYCRR Part 900.

3 **Q. What is the purpose of your testimony?**

4 A. The purpose of our testimony is, pursuant to the Ruling on Issues and Party Status  
5 issued by the presiding Administrative Law Judges (ALJs) in this matter on July 8, 2021  
6 (Ruling) (DMM Item No. 47) and Interim Decision of the Executive Director, dated  
7 September 27, 2021 (Interim Decision) (DMM Item No. 58), to further develop the record  
8 on three issues: (i) the factual basis for the Draft Permit condition that requires Applicant  
9 to develop a Net Conservation Benefit Plan (NCBP) for impacts to wintering habitat of the  
10 short-eared owl and northern harrier within the Facility site; (ii) the need for and scope of  
11 a potential minimum setback for Turbines T1 - T6 from the Iroquois National Wildlife  
12 Refuge (NWR) and State WMAs to avoid, minimize, or mitigate to the maximum extent  
13 practicable potential adverse environmental impacts to wildlife utilizing these resources;  
14 and (iii) the key elements of a post-construction avian and bat monitoring plan and adaptive  
15 management program for the Project to be implemented in the event that post-construction  
16 monitoring reveals that impacts to bird and bat species are not adequately avoided,  
17 minimized, or mitigated as anticipated during facility operations.

18 **Q. What does the Draft Permit provide with respect to these issues?**

19 A. The Draft Permit, which was developed in consultation with the Department,  
20 includes, among other provisions, the following site-specific condition at paragraph 6(b):

1 Pursuant to §900-3.2(a)(2) and consistent with 19 NYCRR § 900-10.2, the  
2 Permittee shall submit an additional NCBP which shall: (i) achieve a net  
3 conservation benefit for wintering habitat of the short-eared owl and northern  
4 harrier impacted within the Facility site; and (ii) include a post-construction avian  
5 and bat monitoring plan to address potential impacts to migratory birds due to  
6 proximity to the Iroquois National Wildlife Refuge and nearby bald eagle nests  
7 (said plan to include at least two years of monitoring during the first five years of  
8 Facility operation).

9 **Q: Please provide an overview of your testimony.**

10 A. In order to develop the record as directed, our testimony will: 1) provide  
11 background regarding the biology and behavior of grassland and migratory birds; 2)  
12 summarize existing literature regarding the impact of wind projects on grassland birds; 3)  
13 identify certain State-listed T&E species, listed in accordance with Article 11 and the  
14 implementing regulations found at Part 182; and 4) identify how protected migratory birds  
15 could be impacted by the proposed Facility in a way that is not addressed by the Office's  
16 uniform standards and conditions (USCs) at 19 NYCRR Subpart 900-6, thus requiring the  
17 preparation of site-specific terms and conditions to avoid, minimize and mitigate, to the  
18 extent practicable, potential significant adverse impacts on listed and unlisted wildlife  
19 species in compliance with Executive Law § 94-c(3)(d). In that context, we will discuss:  
20 (i) the factors the Department considers in making regulatory determinations pursuant to

1 the applicable statutes and regulations; (ii) how these factors apply to the Project; and (iii)  
2 whether the Project has met the applicable State standards.

3 **Q. What is the Department's role with respect to the review of permit**  
4 **applications pursuant to Executive Law § 94-c?**

5 A. We are advised by Department Counsel that the State's T&E and protected species  
6 programs, with the attendant statutory and regulatory authority, apply to the Project, as  
7 proposed, and to the Office's deliberations and required findings pursuant to the  
8 Accelerated Renewable Energy Growth and Community Development Act (L.2020, c. 58,  
9 pt. JJJ) and Executive Law § 94-c. More specifically, Executive Law § 94-c requires that  
10 certain determinations in the review of applications for major renewable energy facilities  
11 be made by the Office in consultation with the Department, including without limitation:  
12 (a) the identification of site-specific environmental impacts, if any, that may be caused or  
13 contributed to by a specific proposed facility and are unable to be mitigated by the Office's  
14 USCs for such impacts at 19 NYCRR Subpart 900-6; as well as (b) the drafting of site-  
15 specific terms and conditions for such impacts, including provisions for the avoidance and  
16 mitigation thereof. Executive Law § 94-c(3)(d). The Office, in consultation with the  
17 Department, must take into account the Climate Leadership and Community Protection  
18 Act (CLCPA) targets and the environmental benefits of the proposed facility, with the  
19 Office being responsible for ensuring that the application of USCs and site-specific  
20 conditions shall achieve a net conservation benefit to any impacted threatened or  
21 endangered species. Finally, we are advised by Department Counsel that the Department



1 is authorized to provide such additional support and services as shall be requested by the  
2 Office in accordance with Executive Law § 94-c(3)(h). The Office requested our support  
3 and services in this proceeding for the purposes of evaluating the potential impact(s) of the  
4 Facility on listed and unlisted bird and bat species, including migratory species utilizing  
5 nearby federal and state lands described herein.

6 Accordingly, our testimony discusses how the Office should: (i) consider the  
7 State's T&E and protected species programs to ensure the Project's compliance with  
8 Executive Law § 94-c, Article 11 and its implementing regulations; (ii) address potential  
9 impacts, in consultation with the Department, to unlisted species and potential migratory  
10 bird impacts that are not addressed in the Office's USCs in compliance with Executive  
11 Law § 94-c; and (iii) apply the same to its deliberations and required findings under  
12 Executive Law § 94-c in its decision to approve (or not approve) an application for a  
13 proposed major renewable energy facility. Noting that the Office and Department lack the  
14 authority to permit any violation of federal law, the Department's testimony is subject to  
15 the overall jurisdictional limitation that nothing in Executive Law § 94-c shall exempt the  
16 Applicant from its independent obligation to establish and maintain compliance with  
17 applicable federal laws and regulations (including without limitation the federal Migratory  
18 Bird Treaty Act). Executive Law § 94-c(4)(a).

19 **Q. What information has provided the basis for your testimony?**

20 A. Our testimony is based on the application seeking a certificate of environmental  
21 compatibility and public need from the New York State Board on Electric Generation

1 Siting and the Environment (the "Siting Board") submitted by the Applicant on March 13,  
2 2020 pursuant to Article 10 of the Public Service Law ("PSL") and the Siting Board's rules  
3 (16 NYCRR Part 1000 et seq.) ("Article 10 Application"), together with: (a) Application  
4 Supplements submitted by the Applicant to the Siting Board on September 4, 2020,  
5 October 28, 2020 and November 3, 2020; and (b) that certain Transfer Application dated  
6 January 13, 2021 to the Office pursuant to Section 94-c of the New York State Executive  
7 Law (collectively, the "Application").

8 Specifically, our testimony is based upon our review of the Applicant's Article 10  
9 Exhibit 22 (Terrestrial Ecology and Wetlands), including without limitation the following  
10 corresponding Appendices and associated Figures submitted by the Applicant:

- 11 • Appendix 22-A Plant and Wildlife Species Inventory
- 12 • Appendix 22-C (Confidential Survey Information):
  - 13 • 2017 Avian and Bat Study Plan (dated May 5, 2017);
  - 14 • 2016-2017 Wintering Grassland Raptor Survey (Year 1) (dated May 25, 2017);
  - 15 • 2017 Breeding Bird Survey (Year 1) (dated September 26, 2017);
  - 16 • 2017 Spring Migratory Raptor Survey (Year 1) (dated October 30, 2017);
  - 17 • 2016-2017 Avian/Eagle Use Survey (Year 1) (dated February 2018);
  - 18 • 2017 Fall Migratory Raptor Survey (dated February 15, 2018);
  - 19 • 2017-2018 Winter Grassland Raptor Survey (Year 2) (dated July 2018);
  - 20 • 2018 Raptor Nest Survey (dated September 2018);

- 1 • 2018 Breeding Bird Survey (Year 2) (dated September 2018);
- 2 • 2018 Spring Migratory Raptor Survey (Year 2) (dated October 2018); and
- 3 • 2017-2018 Avian/Eagle Use Survey (Year 2) (dated January 2019).
- 4 • Appendix 22-F Avian Risk Assessment (Redacted)
- 5 • Appendix 22-G Cumulative Impacts Analysis (Redacted)
- 6 • Appendix 22-H Net Conservation Benefit Plan – Northern Long-eared Bat and
- 7 Bald Eagle (Redacted)

8 We also reviewed comments submitted on the record by the public and the  
9 Applicant, as well as the documents and materials as set forth in the References  
10 and Supporting Information set forth in Exhibit ORES-RK-3. We reviewed all the above-  
11 referenced materials in the context of ensuring that the Application and Project meet the  
12 requirements of Executive Law § 94-c and Article 11.

13 **IMPACTS TO SPECIES UNDER 94-c**

14 **Q. How are potential impacts to State T&E and protected species considered**  
15 **under Executive Law § 94-c?**

16 A. As previously stated, we have been advised by Department Counsel that the State's  
17 T&E and protected species programs apply to the Project. Executive Law § 94-c requires  
18 the Office, in consultation with the Department, to: (a) identify those site-specific  
19 environmental impacts, if any, that may be caused or contributed to by the Applicant's  
20 proposed Facility and are unable to be mitigated by the Office's USCs for such impacts at  
21 19 NYCRR Subpart 900-6; and (b) draft site-specific terms and conditions for such

1 impacts, including provisions for the avoidance and mitigation thereof. Executive Law §  
2 94-c(3)(d). With respect to State T&E species, Executive Law § 94-c(3)(d) imposes the  
3 further obligation on the Office to “require that the application of uniform standards and  
4 conditions and site-specific conditions shall achieve a net conservation benefit to any  
5 impacted endangered or threatened species.”

6 **Q. Does Executive Law § 94-c require consideration of potential impacts of the**  
7 **proposed Facility to other species, such as species of special concern, or unlisted**  
8 **species of birds and bats (regardless of classification)?**

9 A. Yes. As noted, the Office, in consultation with the Department, is responsible for  
10 identifying relevant impacts, including potential impact(s), to all wildlife species, and  
11 drafting site-specific terms and conditions for the avoidance, minimization and mitigation  
12 of those impacts that may be caused or contributed to by a proposed major renewable  
13 energy facility and are unable to be addressed by the Office’s USCs at 19 NYCRR Subpart  
14 900-6. Species of special concern and unlisted bird and bat species are covered by this  
15 requirement, with the only difference being that the additional requirement of a net  
16 conservation benefit is applicable only to any impacted State T&E species.

17 **Q. Is the analysis any different for migratory bird or bat species impacted by a**  
18 **proposed facility, whether listed or unlisted?**

19 A. No. The Executive Law requires an evaluation of the potential impacts of a  
20 proposed wind facility to all species of birds and bats – including migratory birds and bats,

1 both listed and unlisted species – and mandates the preparation of site-specific terms and  
2 conditions for those impacts, if any, that are unable to be addressed by the Office’s USCs.

3 **PERTINENT BIOLOGY AND BEHAVIORS OF GRASSLAND AND**  
4 **MIGRATORY BIRDS**

5 **Q. What is a general description of grassland birds?**

6 A. Grassland birds consist of those species that rely on open habitats lacking in tall  
7 trees, extensive shrub cover, and human infrastructure – such as grasslands, hayfields,  
8 pastures, fallow fields, and wet meadows – to successfully perform one or more essential  
9 life functions including feeding, nesting, roosting, wintering and migrating.

10 **Q. What is the biology and behavior of grassland birds in general?**

11 A. Grassland birds breed and winter, depending on the species, within large grassland  
12 fields spread across the State. Different species vary in their preferences for the various  
13 habitat characteristics found within grassland field types. Most species require large  
14 (greater than 25 acres) expanses of open habitat, generally free of large trees, hedgerows,  
15 tall structures such as power poles, wind turbines, or meteorological towers, houses, busy  
16 roads, or other human disturbances. Dechant et al., 2002; Peterson, 1983; Morgan and  
17 Burger, 2008; Smith and Smith, 1992. To successfully breed, some species require 80-100  
18 acres or more of quality open habitat. Peterson, 1983; Environment Canada, 2013.  
19 Vegetation, including grasses, sedges, some forbs, as well as agricultural crops such as hay  
20 and alfalfa, provide cover for nesting, foraging, and roosting. While monocultures of corn,

1 soybeans, and other row crops are not preferred nesting habitat for most grassland birds,  
2 these agricultural activities are often in place on a rotational basis on the landscape. Such  
3 fields provide suitable nesting habitat when planted with hay, alfalfa, or left fallow for one  
4 or more years following the presence of row crops. Areas that remain as harvested row  
5 crops over the winter often serve as foraging areas for wintering raptors hunting small  
6 mammals that are attracted to waste grain. Williams et al., 2000.

7 **Q. Are grassland bird species a particular conservation concern in New York**  
8 **State?**

9 A. Yes. Quality grassland habitat is a cover type that requires regular maintenance and  
10 is declining in New York State, and grassland bird species have been declining faster than  
11 any other habitat-species suite both nationally (Rosenberg et.al., 2019) and in the  
12 northeastern United States (Vickery and Herkert, 2001; Morgan and Burger, 2008; Ribic  
13 et.al., 2009; Stevens et.al., 2013). The primary cause of these declines is abandonment of  
14 agricultural lands, causing habitat loss as once open areas revert to later successional stages  
15 of shrub and young forest cover. Some other threats to grassland bird species on the  
16 landscape include habitat fragmentation, mortality incurred during summer agricultural  
17 activities, predation by wild and domestic animals, parasitism by brown-headed cowbirds  
18 (*Molothrus ater*), and human disturbance. Norment, et.al., 2010; Brennen and Kuvlesky,  
19 2005. Stabilizing the decline of populations of grassland birds has been identified as a  
20 conservation priority by virtually all bird conservation initiatives, groups, and agencies in

1 the northeastern United States, as well as across the continent. Vickery and Herkert, 2001;  
2 Brennan and Kuvlesky, 2005; Rosenberg et.al., 2019.

3 **Q. What species of grassland birds are of particular conservation concern in New**  
4 **York State?**

5 A. There are two species of grassland birds in New York State listed as endangered:  
6 short-eared owl (*Asio flammeus*), and loggerhead shrike (*Lanius ludovicianus*); four  
7 species listed as threatened: northern harrier (*Circus hudsonius*), upland sandpiper  
8 (*Bartramia longicauda*), sedge wren (*Cistothorus platensis*), and Henslow's sparrow  
9 (*Centronyx henslowii*); and three species of special concern: horned lark (*Eremophila*  
10 *alpestris*), vesper sparrow (*Pooecetes gramineus*), and grasshopper sparrow (*Ammodramus*  
11 *savannarum*). All of these species are considered species of greatest conservation need, as  
12 are the following three grassland bird species: American kestrel (*Falco sparverius*),  
13 bobolink (*Dolichonyx oryzivorus*) and eastern meadowlark (*Sturnella magna*). NYSDEC,  
14 2015.

15 **Q. What threatened and endangered, species of special concern, and species of**  
16 **greatest conservation need grassland bird species have been documented in the**  
17 **Project area during surveys performed in support of the Application?**

18 A. Two State-listed threatened and endangered grassland bird species have been  
19 observed on the proposed Project site: northern harrier and short-eared owl. Three  
20 grassland bird species designated as species of special concern have also been observed in  
21 the Project site: horned lark, vesper sparrow and grasshopper sparrow. Three grassland bird

1 species of greatest conservation need have been observed in the Project site: American  
2 kestrel, bobolink, and eastern meadowlark.

3 **Q. What are migratory birds and what are stopover sites?**

4 A. Migratory birds are birds that travel between non-breeding wintering areas and  
5 summer breeding grounds. Migratory birds include raptors, songbirds, waterfowl,  
6 shorebirds, and a variety of waterbirds such as herons, rails, grebes, and terns. Stopover  
7 sites are areas where birds spend time during migration to rest and feed. The Great Lakes  
8 are a significant obstacle to migratory birds (Ewert, 2008), and as a result, habitat areas  
9 within the Great Lakes Region, including high-quality and diverse inland sites such as the  
10 Iroquois complex, serve as extremely important stopover sites for migratory birds. These  
11 areas offer much needed food resources and shelter prior to and after crossing the Great  
12 Lakes.

13 **Q. Are migratory birds of conservation concern?**

14 A. Yes. In a recent study, reported a net loss of approximately 3 billion birds in North  
15 America since 1970, representing a 29% loss. Rosenberg et al. (2019). Of the 419 native  
16 migratory species, 58.2% were shown to be in decline, with a net decrease in abundance of  
17 2,547.7 million birds. Rosenberg et al. (2019). A large decline in nocturnal passage of  
18 migratory birds was also observed using an analysis of NEXRAD data from a 10-year  
19 period. Many of the species that migrate through the Great Lakes Area and/or stay to nest  
20 are state listed species or species of greatest conservation need, including most of the  
21 grassland and marsh nesting species. Ewert et al. (2015) refer to the millions of land birds



1 that migrate through the Great Lakes Region and state that protecting stopover habitat is a  
2 critical conservation concern.

3 **IMPACTS TO GRASSLAND AND MIGRATORY BIRDS**

4 **Q. Are grassland birds – including Short-eared Owls and Northern Harriers –**  
5 **impacted by wind turbine facilities?**

6 A. Yes. There are documented direct and indirect impacts to grassland birds from both  
7 construction and operation of wind turbine facilities, specifically: (i) direct impact by  
8 collision with wind turbines and other project infrastructure; (ii) direct impact to habitat by  
9 the placement of project components in occupied habitat; and (iii) indirect impact by  
10 displacement of grassland bird species from otherwise preferred areas of habitat from both  
11 the presence of tall structures and construction activity.

12 **Q. How will the Project, as proposed, impact Short-eared Owls and Northern**  
13 **Harriers?**

14 A. Department staff has determined that construction and operation of the Project will  
15 result in both direct and indirect loss of occupied habitat, as defined in 6 NYCRR Part 182,  
16 for wintering short-eared owls and northern harriers. Further, without proper work  
17 windows, project construction may impact short-eared owl and northern Harrier  
18 individuals.

19 **Q. How will the Project, as proposed, impact migratory birds?**

20 A. As discussed in detail below, Turbines T1 - T6, as currently sited, pose a significant  
21 risk to migratory birds due to the proximity to the federal Iroquois NWR, and State Oak

1 Orchard and Tonawanda WMAs. The habitat complex composed of the three managed  
2 areas is a major migratory bird stopover site, and there is an increased risk of mortality  
3 from collision for migratory birds ascending from and descending to the habitat areas  
4 through the field of turbines within approximately two miles of the complex.

5 **Issue I: The factual basis for requiring the Applicant to develop a NCBP for impacts**  
6 **to wintering habitat of the short-eared owl and northern harrier within the Facility**  
7 **site**

8 **Q. Have there been any discussions between the Applicant, the Office and**  
9 **Department staff since the Ruling and Interim Decision were issued?**

10 A. Yes. The Office, in consultation with the Department, has entered into a Stipulation  
11 of Settlement (Stipulation) with the Applicant that resolves the need for this issue to be  
12 addressed in our testimony. We have, nonetheless, included certain factual background  
13 regarding the species at issue to ensure the record is fully developed as required by the  
14 Ruling and Interim Decision. DMM Item No. 65.

15 **Q. Is the NCBP in the record at Appendix 22-H (as related to bats and bald eagles)**  
16 **acceptable to the Department and the Office, or are additional revisions required?**

17 A. The NCBP in the record at Appendix 22-H remains under review. Additional  
18 revisions may be required to address compliance monitoring and reporting requirements  
19 set forth in USCs and/or site-specific conditions concerning the effectiveness of  
20 Applicant's proposed mitigation project, eagle mortality, bat mortality and curtailment.

1 **Q. Has the Department or Office received an updated grassland bird NCBP from**  
2 **the Applicant for its review, and if so, does that version address these concerns?**

3 A. No. However, so long as the grassland bird NCBP is revised as noted above and  
4 pursuant to the Stipulation, it would be acceptable to Department staff.

5 **Issue II: A potential setback from nearby wildlife refuges**

6 **Q. What are the respective definitions of a federal National Wildlife Refuge**  
7 **(NWR) and a State Wildlife Management Area (WMA)?**

8 A. As defined by the U.S. Fish and Wildlife Service (USFWS), a “national wildlife  
9 refuge is typically a contiguous area of land and water managed by the U.S. Fish and  
10 Wildlife Service for the conservation and, where appropriate, restoration of fish, wildlife  
11 and plant resources and their habitats for the benefit of present and future generations of  
12 Americans.” <https://www.fws.gov/refuges/about/faq.html>

13 Wildlife Management Areas are properties owned by New York State and operated  
14 by the Department’s Bureau of Wildlife. These lands are managed to provide habitat for  
15 wildlife species and public access to wildlife resources for recreational purposes such as  
16 hunting and wildlife observation. WMAs may be managed primarily for public access  
17 concerns, to promote production of targeted wildlife species, or a combination of both.

18 **Q. Please identify the federal NWR and State WMAs that this testimony and the**  
19 **associated adjudicatory hearing are focused on.**

1 A. The Project is proposed to be located in proximity to the Iroquois National Wildlife  
2 Refuge, the Oak Orchard WMA and the Tonawanda WMA (collectively defined below as  
3 the Iroquois Complex).

4 **Q. Can you provide specific characteristics for each of these areas?**

5 A. As stated in the Iroquois National Wildlife Refuge Comprehensive Conservation  
6 Plan (CCP) (September 2011) prepared by the USFWS:

7 The Iroquois [NWR] was established in 1958 and encompasses 10,828 acres of  
8 open water, emergent marsh, forested wetland, upland forest, grassland, and  
9 shrubland habitats. The refuge lies within the rural towns of Alabama in Genesee  
10 County and Shelby in Orleans County in the Oak Orchard Creek Watershed on the  
11 Lake Plains of western New York (citation omitted). Oak Orchard Creek enters the  
12 refuge from the east, meanders north west, and exits to the north, eventually  
13 emptying into Lake Ontario. The refuge is approximately 25 miles [east] of Lake  
14 Erie and 20 miles south of Lake Ontario. New York State Route 63 runs through  
15 the center of the refuge, bisecting it from east to west. Iroquois Refuge, in  
16 combination with neighboring New York State Wildlife Management Areas, forms  
17 the 19,000-acre Tonawanda-Iroquois-Oak Orchard Wetland Complex (citation  
18 omitted); this complex is one of the largest contiguous blocks of natural habitat in  
19 western New York and includes some of the most productive inland wildlife habitat  
20 in the eastern United States. (CCP at pp. 1-2).

1           The Oak Orchard WMA is a New York State-owned and -managed conservation  
2 area adjoining Iroquois NWR to the east, in the Towns of Shelby and Barre, Orleans  
3 County and the Towns of Alabama and Oakfield, Genesee County. As stated in the Habitat  
4 Management Plan for Oak Orchard Wildlife Management Area 2019-2028 (dated  
5 November 30, 2018) (Oak Orchard WMA Plan) prepared by the Department's Division of  
6 Fish and Wildlife:

7           Oak Orchard [WMA] is located in Genesee and Orleans counties and comprises  
8 2,554 acres. The WMA is part of an approximately 19,000-acre complex of state  
9 and federal land that also includes Iroquois [NWR] and Tonawanda WMA.  
10 Acquisition of the WMA began in 1941 and was mostly complete by 1947, with an  
11 additional 300 acres purchased between the late-1950s and mid-1970s.

12           This WMA is primarily composed of several marsh impoundments that are  
13 managed to provide a variety of wetland habitat conditions throughout the year. A  
14 large, forested wetland surrounding Oak Orchard Creek occupies much of the  
15 western half of the property. Upland habitats compose approximately 20% of the  
16 WMA and mostly consist of large and small grassland fields, with a variety of forest  
17 and shrubland stands scattered throughout. Oak Orchard WMA Plan at p. 3)

18           The Tonawanda WMA is a second State WMA adjoining Iroquois NWR to the  
19 west, in the Town of Shelby, Orleans County, the Town of Newstead, Erie County, the  
20 Town of Royalton, Niagara County and the Town of Alabama, Genesee County.  
21 Collectively, the Oak Orchard WMA, Tonawanda WMA, and Iroquois NWR together

1 make up an approximately 19,000-acre habitat complex, referred to herein as the Iroquois  
2 complex.

3 The primary focus of this testimony is the Oak Orchard WMA and Iroquois NWR,  
4 given the more remote location of the Tonawanda WMA portion of the Iroquois complex  
5 on the opposite (western) side of Iroquois NWR.

6 **Q. How is the Iroquois complex relevant to this proceeding?**

7 A. As discussed further below, the Office, in consultation with the Department, is  
8 evaluating the potential impacts of the proposed major renewable energy facility on  
9 wildlife, given the proximity of certain wind turbines to the Oak Orchard WMA and the  
10 Iroquois NWR.

11 **Q. How are potential impacts to State WMAs evaluated by the Department?**

12 A. Potential impacts are evaluated on a case-by-case basis, taking into account the  
13 resources and functions that a particular WMA is intended to protect and conserve for  
14 wildlife. Here, due to the proximity of the Iroquois NWR to the Oak Orchard and  
15 Tonawanda WMAs, Department staff consulted with USFWS as well.

16 **Q. Ms. Kennedy, do you have personal working knowledge and familiarity with  
17 either the Oak Orchard WMA and/or Iroquois NWR?**

18 A. Yes. I have been the wildlife biologist in charge of managing the Oak Orchard and  
19 Tonawanda WMAs since 2003, and I am co-author of the Oak Orchard Habitat  
20 Management Plan cited above. *See* ORES-RK-3. My work location is at the Iroquois sub-  
21 office which is located within the Iroquois National Wildlife Refuge headquarters. I

1 maintain a close working relationship with Iroquois NWR staff, and there is ongoing  
2 dialogue and cooperation related to the management of the Iroquois complex.

3 **Q. What specific Facility components are proposed to be sited within an**  
4 **impactful proximity to Iroquois NWRs and/or Oak Orchard WMA?**

5 A. While multiple documents in the record state varying distances, the document  
6 prepared by the Applicant titled “Heritage Party Status Response Attachment B Technical  
7 Memorandum on Avian Comments and Issues” indicates that Turbines T1 - T6 are less  
8 than two miles away from the Oak Orchard WMA boundary while being greater than three  
9 miles from the Iroquois NWS boundary. In order to properly ascertain the potential impacts  
10 of Turbines T1 - T6, the Applicant must supplement the record with the accurate distances.

11 **Q. Are there any recommended setbacks for wind project components from a**  
12 **NWR or a WMA?**

13 A. Yes. Based upon the Department’s evaluation of the wildlife resources and  
14 functions that the Oak Orchard WMA is intended to protect and conserve, the Department  
15 recommends that Turbines T1 – T6 be removed or relocated to an area that provides a  
16 minimum two-mile setback from the Iroquois complex and also meets other applicable  
17 requirements. In the Guidelines for Conducting Bird and Bat Studies at Commercial Wind  
18 Energy Projects (DEC Guidelines) (*see* ORES-RK-3), the Department indicates that any  
19 turbines located within two miles of a wildlife concentration area would be subject to  
20 enhanced pre- and post-project studies. DEC also requires applicants to identify if there are  
21 any such features known to exist in proximity to their projects. The DEC Guidelines also

1 require applicants to identify if there are any WMAs or NWRs in proximity to the projects.  
2 Most, but not all, WMAs and NWRs are wildlife concentration areas under designations  
3 such as Bird Conservation Areas, Winter Raptor Concentration Areas, Waterfowl  
4 Concentration Areas, and Audubon Important Bird Areas.

5 **Q. Why are there enhanced concerns regarding siting turbines in proximity to**  
6 **NWRs or WMAs?**

7 A. Both the DEC Guidelines and the USFWS Land-Based Wind Energy Guidelines  
8 (USFWS Guidelines) (*see* ORES-RK-3) draw attention to wildlife concentration areas such  
9 as Important Bird Areas and suggest they should be avoided if possible, with  
10 recommendations for more stringent pre- and post-construction studies if projects will be  
11 cited adjacent to these features. It is not the designation of landownership that makes  
12 NWRs or WMAs potentially vulnerable to adjacent wind development. It is the use of the  
13 NWRs and WMAs by migratory birds and bats, as well as breeding and wintering species,  
14 that are the cause of concern behind the suggestions to avoid those locations. In general,  
15 the closer an animal is to a threat, the more likely they will be affected by it. The two mile  
16 distance referenced in the DEC Guidelines is thought to be protective of migratory birds.

17 **Q. What is the two-mile distance based on?**

18 A. The origin of the two-mile distance is concern over the potential for increased  
19 mortality of migratory birds when turbines are sited in close proximity to high-quality  
20 habitat, (including: breeding, wintering, or stopover habitat). Locations that provide good  
21 habitat concentrate higher numbers of individuals than typical forested areas, wetlands or



1 open fields. When those habitats are distinct from the surrounding landscape, with little  
2 similar habitat available in the local area, the habitats essentially become analogous to an  
3 airport for birds. There will be considerable movement of birds into and out of these  
4 habitats, particularly during migratory periods. During migration, all songbirds and many  
5 waterfowl and shorebirds migrate at night. Most species tend to fly at altitudes that are  
6 typically higher than the rotor swept zone of most current facilities, with mean flight height  
7 for all birds detected at 27 radar studies conducted in New York ranging from 355 meters  
8 to 861 meters. However, each migratory flight has a beginning and an end as the birds  
9 ascend after dusk and descend around dawn. During descent, each bird must move from  
10 their flight height down through the air space typical of the rotor swept zone to reach the  
11 safety of suitable habitat to rest and refuel. Similarly, when birds depart on a migratory  
12 flight, they have to ascend through air space typical of the rotor swept zone as they climb  
13 up to their preferred height above ground level to resume their migratory journey. So again,  
14 just like airports, the areas immediately adjacent to these high-quality habitats experience  
15 higher traffic rates and, more importantly, are the areas where birds are most likely to be  
16 flying at varying elevations as they seek to ascend from the habitat up to their preferred  
17 flight height or descend from their flight down toward the habitat. High-quality habitats  
18 that concentrate migratory birds are going to have greater concentrations of birds within  
19 their boundaries in general. Therefore, it is reasonable to assume that the frequency of birds  
20 flying through the rotor swept zone will be higher in proximity to these habitats. Just like  
21 airports, it is prudent to restrict the number and height of structures in proximity to high-

1 quality migratory bird habitat to reduce the likelihood of accidental collisions on approach  
2 or departure.

3 To figure out what distance is far enough away from a migratory bird concentration  
4 area, one needs to know how quickly the birds ascend or descend. Hedenstrom and  
5 Alerstam (1992) measured ascent rates and horizontal air speeds for a suite of migratory  
6 birds, including five passerine migrants. Using the average ascent rate ( $0.98 \pm 0.25$  m/s)  
7 and wind-corrected horizontal air speed ( $12.5 \pm 2.11$  m/s) across the 5 passerine species,  
8 one can calculate how far away a migratory bird would have to initiate flight to exceed a  
9 particular rotor swept zone (R.H. Diehl, personal communication). While the species in the  
10 Hedenstrom and Alerstam study are not native to North America, the values calculated  
11 from their data are similar to ascent rates measured for Swainson's thrush in the Midwest  
12 (Bowlin et. al., 2015) and the horizontal air speeds are similar to those estimated by Larkin  
13 (1991). The approach to calculating setbacks is also similar to that proposed for stopover  
14 habitat setbacks in a more recent study by Willock et.al. (2021). Here, the Applicant  
15 proposes to use turbines with a maximum height of 206m. If you provide a 25m buffer to  
16 account for turbulence and local variation in topography, the height increases to 231m.  
17 This mean distance comes out to 2.00 miles with a standard deviation of 0.37 miles for a  
18 height of 231m. The mean would reflect the distance that, across all species, 50% of the  
19 birds would have been able to climb above the rotor swept zone. Given the direction that  
20 wind technology is going, it may be more prudent to use a greater height to account for  
21 future repowering at this location as turbine designs continue to increase in size, but for the

1 purposes of this testimony, the actual height of proposed turbines is what this analysis is  
2 based on.

3 While all birds using a particular habitat would not be expected to initiate their  
4 flight from the boundary closest to any proposed project, all 27 radar studies done in  
5 support of wind projects in New York show the mean direction of movement during spring  
6 migration to be to the east of north. These findings are the same as in other published  
7 studies (Rathbun et al., 2016, Diehl et al., 2003). Therefore, regardless of where within the  
8 refuge complex a migratory bird initiates a migratory flight, most birds will be leaving the  
9 refuge complex during spring migration and flying in the direction of the turbines located  
10 north east of the refuge complex. Using the estimates above, to increase the likelihood that  
11 any individual bird departing from the refuge complex would have at least a 95% chance  
12 of being able to successfully climb above a 206 m turbine, all turbines should be located  
13 more than 2.74 miles (mean + 2sd) away from the where the bird is departing from.

14 Again, we recognize that only a portion of the migratory birds are likely to initiate  
15 their migratory flights from the boundary of the complex closest to the facility and not all  
16 birds departing from the habitat will head directly toward a turbine given that the rotor  
17 swept zones represent only a fraction of the air space under 231m to the north east of the  
18 habitat complex. Therefore, we acknowledge that 2.74 miles is conservative. It is of note  
19 that when birds are migrating in the opposite direction in the fall, they are probably more  
20 likely to fly toward the nearest boundary of suitable habitat as they descend toward  
21 stopover habitat at the end of their night flights. However, there is little available data to

1 demonstrate descent rates or the behavior of individual birds as they descend into stopover  
2 habitats.

3 **Q. Can you explain the importance of the Iroquois complex in relation to the**  
4 **benefits it provides to wildlife?**

5 A. The Iroquois complex is an approximately 19,000-acre habitat complex comprised  
6 of the Oak Orchard WMA, Tonawanda WMA, and Iroquois NWR. The Iroquois complex  
7 contains vast areas of forested and emergent wetland juxtaposed with grassland, shrubland,  
8 and upland forest. The complex provides important breeding, wintering, and migratory  
9 habitat for a large suite of species. Several species that breed and/or winter on the areas are  
10 State-listed, including the endangered black tern (*Chlidonias niger*) and short-eared owl,  
11 the threatened Henslow's sparrow, northern harrier, sedge wren, least bittern (*Ixobrychus*  
12 *exilis*), pied-billed grebe (*Podilymbus podiceps*), upland sandpiper, king rail (*Rallus*  
13 *elegans*), and bald eagle, and the Special Concern American bittern (*Botaurus*  
14 *lentiginosus*), osprey (*Pandion haliaetus*), red-headed woodpecker (*Melanerpes*  
15 *erythorcephalus*), horned lark, vesper sparrow, and grasshopper sparrow, among other  
16 species. Multiple High Priority Species of Greatest Conservation Need such as bobolink,  
17 eastern meadowlark, and prothonotary warbler (*Protonotaria citrea*) also use the habitat  
18 on the complex. The complex provides key nesting areas for some of the rarest bird species  
19 in the state; it is one of only six occupied nesting sites currently remaining in the state for  
20 black tern. It is also within a Winter Raptor Concentration Area and a proposed Grassland

1 Bird Concentration Center (designated as such because of the open landscape, the variety  
2 of grassland bird species, and the presence of existing large managed grassland fields).

3 The complex area is a significant migratory bird stopover site, providing valuable  
4 resting and feeding habitat for a large variety of species including songbirds, shorebirds,  
5 and waterfowl. In all, 266 bird species have been documented within the complex, of which  
6 only 60 are year-round residents. USFWS, 2008. Over 100 species have been sighted  
7 during the breeding season since the beginning of the third breeding bird atlas in 2020  
8 (<https://ebird.org/atlasny/>). Extensive areas of wildlife habitat that are surrounded  
9 primarily by intense agriculture and development, as is the case for the Iroquois complex,  
10 serve as islands of habitat in the landscape and therefore tend to attract and concentrate  
11 migrating and breeding birds. Together, the three areas are designated as an Important Bird  
12 Area by the National Audubon Society, and the Tonawanda and Oak Orchard WMAs are  
13 designated as New York State Bird Conservation Area because of the important bird habitat  
14 they provide. *See* ORES-RK-3.

15 **Q: Could you please describe the federal and State management approach for the**  
16 **Iroquois complex and how that approach benefits wildlife resources and preserves**  
17 **NWR/WMA functions?**

18 A. The Iroquois complex represents a significant federal and State investment for the  
19 conservation of wildlife, including without limitation, the protection of migratory birds.  
20 Federal and State officials actively manage the Iroquois complex to provide migratory,  
21 breeding, and wintering wildlife habitat. This work includes large-scale management of

1 wetland and grassland habitats in addition to forest and shrub management by federal and  
2 state workforce stationed on-site and assisted by a capable and dedicated volunteer  
3 network.

4 The Oak Orchard WMA Plan describes the management of this WMA, details its  
5 importance to occupying species, and provides the following on the importance of the  
6 complex to migratory birds:

7 The wetlands complex has exceptional importance to migrating birds because the  
8 surrounding landscape is mostly agricultural, providing minimal wetland habitat,  
9 and because the complex is located near Lake Ontario (approximately 17 miles  
10 away). Before and after birds cross the large expanse of Lake Ontario, they  
11 concentrate in areas of good habitat to rest, eat, and wait for appropriate conditions  
12 to continue traveling. The abundant and diverse habitats on the complex attract high  
13 numbers of migrating birds from numerous species and are especially important to  
14 migrating waterfowl. It is an important goal to maintain the high value of migratory  
15 stopover habitat on the WMA. Oak Orchard WMA Plan at p. 11.

16 As stated in the Iroquois National Wildlife Refuge CCP, Iroquois NWR is an  
17 essential part of the National Wildlife Refuge System, an interrelated set of public lands  
18 and waters specifically set aside for wildlife conservation and other purposes:

19 The Refuge System is the world's largest network of public lands and waters set  
20 aside specifically for conserving wildlife and protecting ecosystems. The Refuge  
21 System began in 1903 when President Theodore Roosevelt designated the 3-acre

1 Pelican Island in Florida as a national bird sanctuary. From its creation, the Refuge  
2 System has grown to 553 national wildlife refuges protecting 150 million acres of  
3 public lands; there is at least one refuge in all 50 States and there are waterfowl  
4 production areas in 10 states. Each year, more than 40 million visitors hunt, fish,  
5 observe and photograph wildlife, or participate in environmental education and  
6 interpretation on refuge lands. Varying in size from half-acre parcels to thousands  
7 of square miles, the majority of these lands are in Alaska, with the rest spread across  
8 the lower 48 States and U.S. territories. Like Pelican Island, many early wildlife  
9 refuges were created for herons, egrets, and other waterbirds. Other refuges were  
10 set aside for large mammals like elk and bison. *But most national wildlife refuges*  
11 *were created to conserve migratory waterfowl. This is a result of the United States'*  
12 *responsibilities under international treaties for migratory bird conservation and*  
13 *legislation such as the Migratory Bird Conservation Act of 1929. Refuges dot the*  
14 *map along the four major "flyways" that waterfowl follow from their northern*  
15 *nesting grounds to southern wintering areas. Iroquois Refuge lies within the*  
16 *Atlantic Flyway (emphasis supplied). CCP at p. 1-9*

17 As further stated in the CCP's Vision Statement for Iroquois NWR:

18 Iroquois [NWR], known locally as part of the "Alabama Swamps" will be the  
19 ecological "puzzle piece" for western New York by creating and maintaining  
20 unsurpassed habitats including wetlands, grasslands, shrublands, and forests for  
21 migratory birds and other wildlife. By encouraging compatible wildlife-dependent

1 recreation and working with partners, a deep understanding and appreciation for  
2 the refuge's ecological integrity will be fostered in its visitors, regardless of  
3 generational, economic, or social boundaries. Through these efforts, future  
4 generations will cherish Iroquois National Wildlife Refuge's interconnectivity to  
5 the much larger National Wildlife Refuge System. CCP at p. 1-23.

6 **Q. Does the Iroquois complex, including Oak Orchard WMA, meet any existing**  
7 **criteria in guidance documents that recommend close scrutiny of setbacks from wind**  
8 **facilities?**

9 A. Yes. Multiple guidance documents recommend siting wind facilities away from  
10 habitat complexes and migratory bird concentration areas such as National Wildlife  
11 Refuges, State Wildlife Management Areas, lakeshores, Important Bird Areas etc. The  
12 DEC Guidelines identify landscape features and resources of potential concern. This  
13 document states “[t]he relative proximity of certain landscape features and/or ecological  
14 resources to a site can increase the likelihood that substantial adverse impacts to bird and  
15 bat resources will result from a proposed wind energy project.” The Iroquois complex  
16 would qualify for multiple categories of concern included in the DEC Guidelines as  
17 follows:

- 18 • Habitat of a listed bird or bat species per 6 NYCRR Part 182 (e.g., species of special  
19 concern, threatened or endangered).



- 1       • The presence of, or proximity to, areas that concentrate raptors, waterfowl, or other  
2       specifically identified species of concern for the site (approximately 2 miles); or a  
3       major bat hibernaculum (approximately 40 miles); and
- 4       • The presence of any specifically identified habitat or landscape feature that may  
5       function to funnel or concentrate birds or bats during migration or for feeding,  
6       breeding, wintering, or roosting activities, such as NWRs, WMAs, grassland focus  
7       areas (Morgan and Burger, 2008), core forest blocks (contiguous areas 150 acres or  
8       larger), high elevation mountaintops, prominent ridgelines, or other significant  
9       habitat areas.

10       The USFWS Guidelines also outline a screening process “[t]o identify broad  
11       geographic areas of high sensitivity due to the presence of: 1) large blocks of intact native  
12       landscapes; 2) intact ecological communities; 3) fragmentation sensitive species' habitats;  
13       or 4) other important landscape-scale wildlife values.” The USFWS has communicated  
14       directly with the Office and the Department and advised that they recommend the removal  
15       of Turbines T1 - T6 beyond the 2-mile boundary of the complex and that they concur with  
16       the setback recommendations set forth in this testimony (D. Stillwell, personal  
17       communication).

18       A guidance document from another Great Lakes State, Wisconsin, has similar  
19       recommendations. The Wisconsin Department of Natural Resources Guidance for  
20       Minimizing Impacts to Natural Resources from Terrestrial Commercial Wind Energy  
21       Development provides a list of “places” not recommended for commercial wind facilities

1 and includes recommended setbacks. These include the following places that coincide with  
2 designations for the Iroquois complex: WMAs (recommended setback minimum one mile),  
3 Priority Migratory Bird Stopover Site (recommended setback three miles), Important Bird  
4 Area (recommended setback three miles), and NWRs (recommended setback maximum  
5 five miles). *See* ORES-RK-3.

6 **Q. Are there any specific factors that indicate an elevated risk of collision for**  
7 **migratory birds within two miles of the Iroquois complex?**

8 A. Yes. There are multiple factors related to migration activity that potentially increase  
9 the risk of collision within at least two miles, as outlined below:

10 1. Radar studies – Radar studies in the proximity of the complex show a high level  
11 of use during migration. Rathbun et. al. (2016) documented spring migration using  
12 avian radar systems at multiple Lake Ontario sites in New York as well as at an  
13 inland site in Genesee County. The radar system documented higher migration  
14 activity at the Genesee site (greater flight passage and target density) than at the  
15 sites located along the Lake Ontario shoreline. The study attributed this high level  
16 of activity in part to the proximity to the Iroquois NWR (approximately 12 miles)  
17 which has “[l]arge patches of different habitats that attract migrants needing to stop  
18 and refuel.” The study also mentioned that this area of Genesee County is along a  
19 possible migratory pathway from the eastern end of Lake Erie to the shore of Lake  
20 Ontario. The Iroquois complex would presumably be an important stopover site  
21 along this route from the eastern end of Lake Erie and Lake Ontario, as evidenced

1 by the 206 migratory species confirmed within the complex (USFWS, 2008).  
2 Therefore, it would be expected that the area immediately surrounding the Iroquois  
3 complex might have a high level of migratory activity.

4 2. Night migration – Many species of birds, including songbirds, many waterfowl and  
5 shorebirds, and numerous other species, including the state listed marsh birds black  
6 tern, least bittern, and pied-billed grebe, migrate at night. Birds migrating in  
7 nighttime conditions may have reduced visibility of turbines located in close  
8 proximity to the Iroquois complex, resulting in increased collision risk. Night  
9 migration activity would not have been captured by the daytime surveys that were  
10 conducted by the Applicant.

11 3. General direction of migration in New York – Multiple studies have documented a  
12 general spring direction of nighttime migration in the vicinity of the project site to  
13 be in a north east direction. Rathbun et al. (2016) documented this flight direction  
14 using avian radar systems at the inland site in Genesee County, and a radar study  
15 conducted by Diehl et al. (2003) documented a general direction of nighttime  
16 migration in May at a radar location in Buffalo to be in a north east direction. This  
17 was similar to the direction at nine other locations in the Great Lakes Region. An  
18 earlier study conducted at an inland site in eastern New York (Bingman, 1980)  
19 showed that the direction of early morning flights of nocturnal migrants was in a  
20 north east direction in the spring and a south west direction in the fall, the same  
21 directions flown at night. This is significant because the Project is proposed directly

1 to the north east of the Iroquois complex and would presumably be within the flight  
2 path of migrants leaving the complex on their journey toward their breeding  
3 grounds in the spring. In particular, migrants that used the Iroquois complex to rest  
4 during the day, would be ascending directly into the turbine field to the north east.  
5 In the fall, birds coming in from the north to use the Iroquois complex as stopover  
6 habitat would also pass through the Project site.

7 4. Migration flight height and a greater risk of bird collision with turbines close to  
8 stopover sites – Although Erickson et al. 2001 state that most migratory species  
9 generally migrate at heights above the altitude of wind turbines, they refer to most  
10 new wind turbines at the time of the document as having a distance of less than 350  
11 feet to the tip of the blades. The distance to tip of blades for the Project, as proposed,  
12 is significantly greater at 675 feet. After accounting for the geometric shape of the  
13 sampled space, Rathbun et al. (2016) found that the peak target per hour densities  
14 were in the 50-200m (164 – 656 feet) altitude bands. With 5.91 targets/1,000,000  
15 m<sup>3</sup>/night-hour, the 100-150m altitude band was the most heavily used at the  
16 Genesee County site. Erickson et al. 2001 also state that weather and other factors  
17 can reduce flight height of nocturnal migrants. One important factor that would  
18 reduce flight height is distance to stopover habitat. Descending to and ascending  
19 from stopover sites would increasingly put birds into the rotor zone and at greater  
20 risk of collision (Wellick et.al., 2021, Rathbun et al., 2016), a major reason why  
21 there is guidance to avoid key stop over habitats (AWWI, 2021)). As stated above,

1 in the spring, birds would be ascending from the complex into the turbine field to  
2 the north east, and in the fall, they would be descending through the turbine field  
3 traveling in a south west direction into the complex.

4 **Issue III: Key elements of a post-construction avian and bat monitoring plan and**  
5 **adaptive management program for the Project**

6 **Q. What are the key elements of a standard post-construction avian and bat**  
7 **monitoring plan and adaptive management program for the Project?**

8 A. Key elements will ultimately depend upon whether Turbines T1 – T6 are removed  
9 and/or relocated to an area two miles or more from the Iroquois complex as recommended  
10 above, as heightened measures will be required for any turbines located within this area.  
11 An standard approvable Post-Construction Avian and Bat Monitoring and Adaptive  
12 Management Plan shall include direct impact fatality studies, habituation/avoidance  
13 studies, breeding bird surveys along with details of these studies (i.e., the start date, number  
14 and frequency of turbine searches, search area, bat monitoring, duration and scope of  
15 monitoring, methods for observational surveys, reporting requirements, etc.), and be based  
16 in part on the DEC Guidelines. The DEC Guidelines will be adapted, as needed, to design  
17 a work plan for surveys capable of adequately detecting displacement impacts, rare events  
18 and impacts to listed species.

19 **Q. Are there additional elements that should be included in a post-construction**  
20 **avian and bat monitoring plan and adaptive management program for the Project**  
21 **should any of Turbines T1 - T6 ultimately be sited in the current proposed locations?**

1 A. Yes. Due to the proximity of Turbines T1 - T6, as proposed, to the Iroquois complex  
2 (particularly the Iroquois NWR and Oak Orchard WMA), which includes breeding and  
3 wintering habitat that concentrates populations of many avian species in addition to the  
4 state listed birds, the post-construction monitoring program must comply with the guidance  
5 on expanded post-construction studies as identified in the DEC Guidelines. This should  
6 include direct mortality monitoring at all turbines within two miles of the complex  
7 boundary. An approvable monitoring plan must also include an approach for evaluating the  
8 relative avian mortality rates in relation to proximity to the complex. The monitoring plan  
9 should be capable of determining if (i) mortality rates at any turbines within two miles of  
10 the complex boundary are significantly different than the industry average of 2  
11 birds/year/MW (AWWI, 2020); (ii) mortality rates at any turbines within two miles of the  
12 complex boundary are significantly different from other turbines within the Project; and  
13 (iii) overall Project mortality rates are significantly different from the industry average. An  
14 adaptive management plan based on the results of the post-construction monitoring results  
15 must also be developed. At a minimum, that adaptive management plan must clearly  
16 identify what data is necessary to trigger specific management interventions. The following  
17 conditions must be incorporated into the plan:

- 18 • A minimum of two years of post-construction monitoring will be implemented.
  - 19 ○ No adaptive management would be necessary if the results of post-  
20 construction monitoring indicate that none of the turbines exceed the  
21 industry average.

- 1                   ○ If the results of post construction monitoring indicate that mortality  
2                   at any turbines exceeds the industry average, adaptive management  
3                   must be implemented at those turbines.
- 4           • Adaptive management actions should be reasonably expected to reduce the risk of  
5           collisions. Acceptable actions would include implementation of measures such as  
6           shutting down turbines when conditions consistent with those recorded when  
7           mortality events were documented (e.g., time of year, time of day, weather events)  
8           or the implementation of technologies that can otherwise reduce the likelihood of  
9           bird strikes.
- 10          • For the portion of the project area that requires adaptive management, post-  
11          construction monitoring must continue and be designed to assess the effectiveness  
12          of the actions taken at reducing mortality at those turbines.
- 13                   ○ If monitoring demonstrates that mortality is reduced back to the  
14                   industry average, no additional monitoring would be required as  
15                   long as the adaptive measures remain in place.
- 16                   ○ If adaptive measures are not shown to reduce mortality rates at  
17                   turbines back down to the industry average, additional actions to  
18                   reduce collisions should be pursued and post-construction  
19                   monitoring at those turbines must continue until such time as  
20                   mortality rates are demonstrated to have been reduced to the  
21                   industry average.

- 1       • In the event the Office determines, in consultation with the Department, that such  
2       additional measures are not or will not be effective at reducing collisions to a level  
3       at or below the industry average, the impacting turbine (or turbines) shall be  
4       decommissioned and removed.

5       **Q.     What is your collective recommendation to presiding ALJs and the Executive**  
6       **Director with respect to the issues discussed in this testimony?**

7       A.     Based upon the Department’s evaluation of the wildlife resources and functions  
8       that the Oak Orchard WMA is intended to protect and conserve, the WMA’s role as a  
9       significant part of the larger Iroquois complex, and the complex’s importance to migratory  
10      birds, consideration of wind facility setbacks is appropriate and reasonable in this case. To  
11      the extent practicable, we advise that no turbines be sited within two miles of the Iroquois  
12      complex. If, however, it is ultimately determined that any, or all, of these Turbines are sited  
13      within two miles of the complex, then the Applicant must be required to prepare and  
14      implement the expanded post-construction monitoring and adaptive management plans  
15      discussed above.

16      **Q.     Do you hold your opinions to a reasonable degree of scientific certainty?**

17      A.     Yes, we do.

18      **Q.     Does this conclude your direct testimony on these topics?**

19      A.     Yes, it does.