

**BEFORE  
THE OHIO POWER SITING BOARD**

In the Matter of the Application of Firelands Wind, )  
LLC for a Certificate of Environmental Compatibility )  
and Public Need to Construct a Wind-Powered ) Case No. 18-1607-EL-BGN  
Electric Generation Facility in Huron and Erie )  
Counties, Ohio. )

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**REPLY BRIEF OF FIRELANDS WIND, LLC**

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**December 4, 2020**

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## I. INTRODUCTION

The proceedings in this matter were conducted by the Ohio Power Siting Board (“Board”) in accordance with the provisions in Ohio Revised Code (“R.C.”) Chapter 4906 and Division 4906 of the Ohio Administrative Code (“O.A.C.”).

On January 31, 2019, as supplemented on March 18, April 11, July 10, and October 4, 2019, and January 24, 2020, Firelands Wind, LLC (“Firelands” or “Applicant”) filed an application with the Board for a certificate of environmental compatibility and public need (“Application”) to construct a wind-powered electric generation facility on leased land in Groton and Oxford Townships, Erie County, and Lyme, Norwich, Richmond, Ridgefield, and Sherman, Townships, Huron County, Ohio (“Project” or “Emerson Creek Wind Facility”) with a generating capacity of up to 297.66 megawatts (“MW”).

On September 11, 2020, Firelands, the City of Willard, the Board of Commissioners of Huron County (“Huron Commissioners”), the Board of Trustees of Richmond Township of Huron County (“Richmond Trustees”), the Board of Trustees of Norwich Township of Huron County (“Norwich Trustees”), residents Tom Yingling and Kevin Erf, and the Staff of the Ohio Power Siting Board (“Staff”) (jointly referred to herein as “Stipulating Parties”) filed a Joint Stipulation (“Stipulation”). The evidentiary hearing in this matter commenced on October 5, 2020. Following nine days of hearing, including rebuttal testimony from the Applicant, the Administrative Law Judge (“ALJ”) determined that the initial briefs and reply briefs would be due by November 20, 2020, and December 4, 2020, respectively.

On November 20, 2020, initial briefs were filed in this docket by Firelands, Staff, residents Tom Yingling and Kevin Erf, and jointly by the Black Swamp Bird Observatory (“BSBO”) and the Local Residents<sup>1</sup> (hereinafter referred to as “BSBO/Residents”).

When the General Assembly created the Board almost 50 years ago, it charged the Board with finding the appropriate balance between the growth and advancement in energy development, and the preservation and protection of ecological and sociological interests. To assist the Board with its determinations in this regard, the General Assembly created a set of eight criteria to

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<sup>1</sup> The Local Residents are Alvin Didion, Patricia Didion, Jane Fox, Marvin Hay, Theresa Hay, Patricia Olsen, Sheila Poffenbaugh, Walt Poffenbaugh, Christina Popa, John Popa, Lori Riedy, Charles Rogers, Kenn Rospert, Dennis Schreiner, Sharon Schreiner, Donna Seaman, William Seaman, Deborah Weisenauer, Kenneth Weisenauer, and Gerard Wensink.

measure the impact from a proposed energy facility. Those criteria are found in R.C. Sections 4906.10(A)(1) through (8). A review of the record and the initial brief submitted by BSBO/Residents reflects that there is no dispute regarding the following 5 criteria found in R.C. Section 4906.10(A):

1. (A)(1): There is no dispute in this proceeding that the criterion set forth in R.C. Section 4906.10(A)(1), i.e., the basis of need for this facility, is not applicable in this proceeding.<sup>2</sup>
2. (A)(4): There is no dispute that the facility is “consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems and that the facility will serve the interests of electric system economy and reliability.”<sup>3</sup>
3. (A)(5): There is no dispute that the facility complies with the air and water pollution control, withdrawal of waters of the state, solid and hazardous wastes, and air navigation requirements.
4. (A)(7): There is no dispute that, based on the record in this case, the Board can determine the impact of the facility on agricultural land.
5. (A)(8): There is no dispute that the facility incorporates the maximum feasible water conservation practices.

Thus, BSBO/Residents are only disputing that the Stipulation and the record in this case do not satisfy the following 3 of the 8 criteria in R.C. Section 4906.10(A):

1. (A)(2): BSBO/Residents erroneously claim the record does not provide enough information for the Board to determine of the probable environmental impact of the facility.
2. (A)(3): BSBO/Residents erroneously claim that the record and the Stipulation do not provide sufficient documentation to enable the Board to determine that the

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<sup>2</sup> This criterion only applies to electric transmission line and gas pipeline facilities.

<sup>3</sup> BSBO/Residents allege in their initial brief that the Project does not serve the public interest, convenience, and necessity due to its “lack of efficiency and reliability in producing electricity....as required by R.C. 4906.10(A)(6).” (BSBO/Residents Br. at 34). As explained further in this reply brief, such unsubstantiated assertions by BSBO/Residents are not supported by any expert testimony on the record and, in fact, is disproven by the findings of the regional transmission organization (“RTO”), PJM Interconnections, LLC (“PJM”) and the Applicant’s expert witness. Of great significance is the fact that nowhere in their brief or even in the record in this case do BSBO/Residents contest the fact that the Applicant has complied with R.C. Section 4906.10(A)(4), and that the Board can make its determination under R.C. Section 4906.10(A)(4) that the facility is consistent with regional plans and will serve the interests of the electric system economy and reliability.

facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of various alternatives.

3. (A)(6): BSBO/Residents erroneously claim that the record and the Stipulation do not provide sufficient documentation to enable the Board to determine that the facility will serve the public interest, convenience, and necessity.

As thoroughly summarized in the Applicant's initial brief and further reinforced herein, the assertions by BSBO/Residents in their initial brief regarding the Board's ability to make its determinations under R.C. Section 4906.10(A)(2), (3), and (6) thereby adopting the Stipulation in its entirety are incorrect and not supported by the record in this case.

Without any record evidence, in their initial brief BSBO/Residents make broad unsubstantiated disparaging comments directed at Firelands, its consultants, and the documentation supporting adoption of the Stipulation, including, but not limited to, allegations that: Firelands followed "deceptive practices to disguise noise impacts"<sup>4</sup>; [t]he company has intentionally designed its field surveys of birds so as to avoid detections of most birds"<sup>5</sup>; and the Applicant "manipulated mathematical statistics to disguise the extent of risk to birds...utilizing tricks to underestimate risk..."<sup>6</sup> BSBO/residents further disrespect the important role that Staff, ODNR, and USFWS play in the review and consideration of the Application and the studies and documentation included therein. The Applicant will not waste the Board's valuable time with refuting all of the defamatory and unsupported allegations concocted by BSBO/Residents in an effort to further their position. Rather, the Applicant will provide the Board with the following reply that points to the evidence in the case that fully supports the Board's adoption of the Stipulation without modification.

## II. ARGUMENT

In their initial brief, BSBO/Residents allege several issues and, while a couple of the issues do not reference any statutory criteria under R.C. Section 4906.10 to support that issue, other issues cite to the 3 criteria summarized above as in dispute [i.e., R.C. Sections 4906.10(A)(2), (3), and/or (6)]. The only issues raised by BSBO/Residents in their brief are:

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<sup>4</sup> BSBO/Residents Br. at 1.

<sup>5</sup> *Id.* at 48.

<sup>6</sup> *Id.* at 56-57.

1. Potential impact of sound from the turbines alleging non-compliance with R.C. Sections 4906.10(A)(3) and (6).
2. Potential for the presence of karst in some areas of the Project alleging non-compliance with Sections 4906.10(2), (3), and (6).
3. Setback of turbines to property and roads with no reference to any section of the R.C.
4. Shadow flicker with no reference to any section of the R.C.
5. Efficiency and reliability of wind alleging non-compliance with R.C. Section 4906.10(6), public interest.<sup>7</sup>
6. Television (“TV”) and Real-Time Kinematic GPS Locator Systems (“RTK”) with no reference to any section of the R.C.
7. Viewshed of the facility alleging non-compliance with R.C. Sections 4906.10(3) and (6).
8. Potential impacts to avian and bat species alleging non-compliance with R.C. Sections 4906.10(A)(2), (3), and (6).

As detailed in the Applicant’s initial brief, with the provisions in the Stipulation, along with the many commitments set forth in the Application and record in this case, there is no doubt that the Board has all the information necessary to determine that the appropriate safeguards are in place to support a determination of the probable environmental impact of the facility, that the facility represents the minimum adverse environmental impact, and that the facility is in the public interest as required under R.C. Sections 4906.10(A)(2), (3), and (6).

**A. The Stipulation and record enable the Board to determine that the sound level from the facility represents the minimum adverse environmental impact and is in the public interest under R.C. Sections 4906.10(A)(3) and (6), respectively.**

The Applicant does not dispute that some sound will emanate from the wind turbines. However, contrary to the assertions of BSBO/Residents the Board is not tasked with protecting the “comfort of the neighborhood in and near the Project.”<sup>8</sup> Rather, the Board’s task is to determine if the Applicant has provided sufficient information to enable the Board to determine

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<sup>7</sup> The Applicant reiterates that PJM as the RTO is the entity that oversees the reliability. BSBO/Residents did not object or contend that the Applicant has not complied with R.C. Section 4906.10(A)(4).

<sup>8</sup> BSBO/Resident Br. at 2.

that the facility represents the minimum environmental impact and is in the public interest.<sup>9</sup> With respect to the potential sound impacts associated with the Project, the record reflects that the answer to both questions is affirmative.

To ascertain whether a project represents the minimal sound impact, the Board established O.A.C. Rule 4906-4-09(F)(2) that imposes a sound level standard of 5 A-weighted decibels (“dBA”) above the nighttime ambient sound level measured in the area, using the equivalent continuous sound level (“Leq”) as the metric for sound at any non-participating sensitive receptor.<sup>10</sup> Contrary to the assertions of BSBO/Residents on brief, the record and the Stipulation support a finding that the Applicant will comply with this requirement.

BSBO/Residents inappropriately accuse Firelands and its experts of employing “deceptive acoustic techniques” in an attempt to justify siting turbines closer to non-participating sensitive receptors. Such bald allegations are unfounded and not supported on the record. In fact, BSBO/Residents provided no evidence on the record concerning the sound studies performed by the Applicant’s experts or the review of such studies by Staff. Instead, BSBO/Residents simply make assertions in their brief that have no factual or evidentiary basis and are based solely on their belief that the Board is to make sure that everyone is comfortable.

It is clear from a review of the initial brief of BSBO/Residents that they have misconstrued both the requirements in the Board’s rules and the conditions in the Stipulation. BSBO/Residents request that, if the Board issues a certificate for the Project, that the “certificate contain a condition that requires Firelands to comply with OAC 4906-4-09(F)(2) as written.” The Stipulation does just that in Stipulation Condition 2, which requires that the “Applicant shall comply with the requirements established by the [O.A.C.] 4906-4-09, regulations associated with wind farms.”<sup>11</sup>

Based on ambient sound monitoring, the existing nighttime background Leq in the area is 44 dBA, which, when applying the Board’s sound level limits results in a nighttime sound level limit of 49 dBA.<sup>12</sup> BSBO/Residents complain that the sound level could be equal to or greater than 49.1 dBA.<sup>13</sup> However, contrary to their misrepresentation, the record reflects that all residences, both non-participating and participating, are projected to experience sound levels of 49

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<sup>9</sup> R.C. Sections 4906.10(A)(3) and (6).

<sup>10</sup> App. Ex. 41 at 3.

<sup>11</sup> Jt. Ex. 1 at 3.

<sup>12</sup> App. Ex. 1 at 69, Ex. G; App. Ex. 41 at 8.

<sup>13</sup> BSBO/Residents Br. at 3.

dBA or less from the Project turbines. In fact, all non-participating residences are projected to be at 48 dBA or less from the Project turbines,<sup>14</sup> which clearly complies with O.A.C. Rule 4906-4-09(F)(2). The O.A.C. Rule requires the Project stay below 5 dBA above the existing nighttime background Leq, the modeling shows that the Project stays below that threshold, and the condition in the Stipulation requires to Project to follow the O.A.C. Rule.

BSBO/Residents further misconstrue Stipulation Condition 33 asserting that it does not comply with O.A.C. Rule 4906-4-09(F)(2). This condition is based on Staff's Report of Investigation ("Staff Report") whereby Staff recommended that the certificate be "conditioned to require that the Applicant demonstrate adherence to the sound output limit and any cumulative noise impact associated with adjacent wind farms should they be built."<sup>15</sup> Thus, Stipulation Condition 33 acknowledges that additional wind farms could potentially be built in proximity to the Emerson Creek Wind Facility and ensures that should that occur the Applicant must take any sound from those projects into account when complying with the sound limitation requirements in O.A.C. Rule 4906-4-09(F)(2). As such, contrary to the analysis of BSBO/Residents, Stipulation Condition 33 makes the sound level requirement in O.A.C. Rule 4906-4-09(F)(2) even more strict.

Next, BSBO/Residents take issue with the sound studies conducted by the Applicant's expert in accordance with O.A.C. Rule 4906-4-08(A)(3)(e) asserting that rule requires that the monitoring sites for the sound studies must be located within the Project area. However, no such requirement is found in the rules; rather, O.A.C. Rule 4906-4-08(A)(3)(e) requires an applicant to submit with its application "a preconstruction background noise sound study of the project area." The Applicant retained a noise control engineer with 17 years of experience in the field of acoustics to evaluate and report on the potential sound impacts from the proposed facility.<sup>16</sup> BSBO/Residents try to make an issue of the sound monitoring locations chosen by the engineer for the sound studies, saying that 2 of the 9 locations were outside the Project area.<sup>17</sup> However, contrary to the accusation of BSBO/Residents, there was no scheme as to choose monitoring locations that were guaranteed to be noisy.<sup>18</sup> The locations for monitoring were chosen by the expert noise control engineer in accordance with industry standard practices.<sup>19</sup> Moreover, sound

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<sup>14</sup> App. Ex. 41 at 10.

<sup>15</sup> Staff Ex. 1 at 50.

<sup>16</sup> App. Ex. 41 at 2.

<sup>17</sup> BSBO/Residents Br. at 4.

<sup>18</sup> *Id.* at 5.

<sup>19</sup> App. Ex. 41 at 9.



levels for the Project are not only in compliance with the rules, but are consistent with Board precedent in other cases where the Board has approved applications for wind facilities in Ohio.<sup>20</sup>

Adverse impact to sound-sensitive areas from facility-related sound is not anticipated as the sound level will not meet or exceed 49.1 dBA. Even though residential sound impacts are anticipated to be minor, the Applicant will employ the following additional mitigation measures: implementing best management practices (“BMPs”) for sound abatement during construction, including use of mufflers, vehicle maintenance, limiting hours of construction, and notifying landowners of certain construction sound impacts in advance. It is also noteworthy that the sound evaluation conducted for the Project was a very conservative study; thus, the sound levels at many locations will be lower than those modeled, since the results were based on 87 turbines utilizing the worst-case scenario sound levels and the Applicant will only construct 52 to 71 turbines; therefore, the Project will not actually produce such high levels of sound.<sup>21</sup>

Moreover, sounds generated by wind turbines are similar to sounds generated by a number of devices, human activities, and environmental settings, including wind, rain, insect, traffic, air conditioning systems, lawn equipment, video games, and radio/television (“TV”) broadcasts.<sup>22</sup>

Finally, BSBO/Residents make the inaccurate claim that the Firelands sound levels will exceed the warnings of the World Health Organization (“WHO”).<sup>23</sup> However, that claim is not true. In reality, the audible sound design goals of the facility conform to the WHO guidelines, as well as the guidelines of the National Association of Regulatory Utility Commissioners (“NARUC”), both of which are conservative and, therefore, protective.<sup>24</sup>

Dr. Mundt, an expert epidemiologist and public health professional, with a Doctorate in Epidemiology and over 30 years of experience working full time in the field of epidemiology, provided undisputed evidence on the record that “at or below the proposed noise levels for the

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<sup>20</sup> *In re Application of Hog Creek Wind Farm, LLC*, Case No. 09-277-EL-BGN, Opinion, Order, and Certificate (Mar. 22, 2010); *In re Application of Paulding Wind Farm, LLC*, Case No. 09-980-EL-BGN, Opinion, Order, and Certificate (Aug. 23, 2010); *In re Application of Blue Creek Wind Farm, LLC*, Case No. 09-1066-EL-BGN, Opinion, Order, and Certificate (Aug. 23, 2010); *In re Application of Paulding Wind Farm II, LLC*, Case No. 10-369-EL-BGN, Opinion, Order, and Certificate (Nov. 18, 2010); *In re Application of Hog Creek Wind Farm, LLC*, Case No. 10-654-EL-BGN, Opinion, Order, and Certificate (Aug. 29, 2011); *In re Application of Northwest Ohio Wind Energy, LLC*, Case No. 13-197-EL-BGN, Opinion, Order, and Certificate (Dec. 16, 2013); *In re Application of Paulding Wind Farm IV, LLC*, Case No. 18-91-EL-BGN, Opinion, Order, and Certificate (Feb. 21, 2019).

<sup>21</sup> App. Ex. 1 at 73-74; App. Ex. 31 at 5.

<sup>22</sup> App. Ex. 42 at 12, 19-20.

<sup>23</sup> BSBO/Residents Br. at 8-9.

<sup>24</sup> App. Ex. 1 at Ex. G; App. Ex. 42 at 9.

Emerson Creek Wind Facility [49 dBA nighttime noise outside non-participating residences], the epidemiological evidence does not demonstrate that wind turbine emissions harm human health.” A thorough review of the epidemiological evidence today provides no basis for establishing a causal relationship between the noise from wind turbines and any disease or harm to human health.<sup>25</sup> The Community Noise and Health Study (“Health Canada Study”), which is one of the largest and best-designed studies on wind turbines and health, demonstrated that there is no clear or consistent association between noises from wind turbines and any quality of life effect or health effect, including any sleep disturbance, blood pressure, and heart rate.<sup>26</sup> Further, health-related studies of myocardial infarction, stroke, diabetes, hypertension, use of sleep medication, and use of anti-depressant medication did not find any clear or consistent evidence that exposure to wind turbine noises leads to actual increases in these health outcomes.<sup>27</sup> Therefore, Dr. Mundt concludes that, “claims of wind turbine emissions harming human health have not and cannot be substantiated epidemiologically.”<sup>28</sup> In his review, Dr. Mundt found no causal connection between sound levels of less than 50 dBA from wind turbines and any human disease or other indicator of serious harm to human health.<sup>29</sup>

BSBO/Residents also claim that it is the Board’s task to “prevent neighbors from hearing annoying...levels of turbine noise.”<sup>30</sup> They acknowledge that the real issue is what they view as the annoyance level of the sound that could bring bodily harm.<sup>31</sup> However, Dr. Mundt notes that annoyance is not a disease or an indicator of harm to health. However, annoyance has been associated with an individual’s attitude for or against wind turbines, and these attitudes can be influenced by conditioning, that is convincing people that some stimulus (sound from wind turbines) is likely to harm them, even if it is incapable of doing such harm.<sup>32</sup> Dr. Mundt explains that, “general annoyance with wind turbines, personal benefit, physical safety concerns, property ownership, province, noise levels, and sensitivity to noise” are statistically inter-correlated. In addition, while not related to wind turbine noise, a number of health indicators, such as migraines, dizziness, tinnitus, chronic pain, and restless leg syndrome, were statistically correlated with

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<sup>25</sup> *Id.* at 3, 8-9.

<sup>26</sup> App. Ex. 42 at 13-15; Feder et al., (2015).

<sup>27</sup> App. Ex. 42 at 15-16.

<sup>28</sup> *Id.* at 8.

<sup>29</sup> *Id.* at 28-29, Att. KM-5.

<sup>30</sup> BSBO/Residents Br. at 2, 9.

<sup>31</sup> *Id.* at 9.

<sup>32</sup> App. Ex. 42 at 12, 16.

annoyance. According to Dr. Mundt, this suggests either that the individuals with these conditions are more easily annoyed with environmental stimuli or they are more likely to self-report annoyance.<sup>33</sup> Several controlled studies demonstrated that self-reporting annoyance and other subjective complaints reflect, in part, that preconceptions about the ability of the noise from wind turbines to harm health, damage the environment, or lead to economic loss, can be significantly influenced by factors such as the color of the wind turbine.<sup>34</sup> The setbacks will also mitigate sound and shadow flicker at non-participating residences, and lessen any potential visual impact of the turbines.<sup>35</sup>

**B. The Stipulation and record enable the Board to determine that the turbines will be located areas that avoid or mitigate the potential presence of karst and ensures that the probable environmental impact has been determined, that the facility represents the minimum adverse environmental impact, and is in the public interest under R.C. Sections 4906.10(A)(2), (3), and (6), respectively.**

As supported on the record, the assertions made by BSBO/Residents in their brief regarding the potential impact of the Project on groundwater are overstated. The commitments in the Application, as enhanced and enforced by the conditions in the Stipulation, confirm that the construction and operation of the Project will not: cut off the community's water supply; obstruct or contaminate the flow of groundwater used by the private wells in the area; and/or result in sink holes, or caves.<sup>36</sup>

Referring to the construction of turbines in the Project area, BSBO/Residents note that "[a]dditional weight on the land surface can create a hole by compressing sedimentary material, by breaking the bedrock, or by eroding sedimentary fill from existing karst cavities by directing water into them."<sup>37</sup> Initially, it is important to note that the actual construction of the turbines in the Project area is no different than construction of any other type of structure in the area, i.e., grain silos, barns, houses. It is also relevant to note that, as shown on Figure 03-2 of the Application,<sup>38</sup> immediately beside the Project boundary in the northwest corner, is a large active stone quarry. (Note: It is the northwestern portion Project area, where the underlying bedrock

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<sup>33</sup> *Id.* at 17, Att. KM-5; Michaud, et al., (2016d).

<sup>34</sup> App. Ex. 42 at 18; Crichton et al., (2014a); Crichton et al., (2014b); Crichton et al., (2015); Crichton and Petrie (2015); Maffei et al., (2013); Ruotolo et al., (2012).

<sup>35</sup> App. Ex. 31 at 12.

<sup>36</sup> BSBO/Residents Br. at 12-13, 16.

<sup>37</sup> *Id.* at 20.

<sup>38</sup> App. Ex. 1 at Figure 03-2, Part 2 of 26.

formations consist of limestone that a site may be susceptible to karst features such as voids and other solution cavities.)<sup>39</sup> The activities at this quarry include movement of large machinery, as well as blasting. In additions, construction of large farm buildings has occurred throughout the area. These activities have been in existence for years in this area. The limited construction of the turbines will be no different.

In their brief, BSBO/Residents list the credentials of their witness Dr. Sasowsky and his knowledge of karst. BSBO/Residents acknowledge that more than a simple visual inspection of the Project area is needed in order to determine the subsurface conditions.<sup>40</sup> However, BSBO/Residents admit that Dr. Sasowsky based his opinion of the geological and hydrogeological configuration of the Project area on his personal observation that there are places in northwest Ohio where karst is present, and the record reflects that Dr. Sasowsky has not personally performed any subsurface studies in the Project area.<sup>41</sup> Dr. Sasowsky has not personally performed any studies or analyses relating to existing wind projects or the effects of karstic features on existing wind projects.<sup>42</sup> Dr. Sasowsky could not recall the excavation depth for the Project's turbines and does not know the pounds per square inch that will be exerted by the turbine foundations.<sup>43</sup> Dr. Sasowsky also has not performed any study or analysis of existing structures in the Project area to determine what effect, if any, the karstic features have on these structures.<sup>44</sup> Despite indicating familiarity with the Project area, Dr. Sasowsky was not aware of the existence of the large quarry and its blasting operations.<sup>45</sup> On the other hand, Applicant's expert witness, Mr. Williams, has performed boring analyses throughout the Project area and is familiar with the Firelands Project. Importantly, Mr. Williams has worked on eight projects with karst geology and worked on projects where grouting was performed. None of those projects have experienced any geotechnical issues.<sup>46</sup>

Contrary to BSBO/Residents assertions,<sup>47</sup> as documented and supported in the record, Firelands has conducted the subsurface geological studies, as well as hydrogeological field work

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<sup>39</sup> App. Ex. 1 at 80, 82, Ex. E; App. Ex. 38 at 5-6.

<sup>40</sup> BSBO/Residents Br. at 22.

<sup>41</sup> *Id.* at 19.

<sup>42</sup> Tr. Vol. VIII at 1065.

<sup>43</sup> *Id.* at 1066.

<sup>44</sup> *Id.* at 1067.

<sup>45</sup> *Id.* at 1074.

<sup>46</sup> App. Ex. 38; Tr. Vol. VI at 770-771.

<sup>47</sup> BSBO/Residents Br. at 13, 26.

in the Project area that enable the Board to make its determination as to the probable environmental impact of the facility in accordance with R.C. Section 4906.10(A)(2). These geotechnical/hydrogeological reviews, reconnaissance, subsurface explorations, and engineering evaluations explored and evaluated subsurface conditions at the proposed building sites, conducted a risk hazard assessment, and developed geotechnical design and construction recommendations for the Project. The geological and hydrogeological studies performed for the Project addressed all of the requirements set forth in the Board's rules and regulations, including, but not limited to: evaluating the impact to public and private water supplies; reviewing maps aquifers, water wells, and drinking water source protection; compliance with drinking water source protection plans; analyzing prospects for flooding in the area; evaluating suitability of the site geology and plans to remedy any inadequacies; evaluating the suitability of soil for grading, compaction, and drainage, and plans to remedy any inadequacies and restore the construction reclamation; and describing plans for test borings and the timing for providing information to the Board regarding subsurface soil properties, static water level, rock quality description, percent recovery, and depth and description of bedrock contact.<sup>48</sup>

From the recitation in their brief, BSBO/Residents would have one believe that karst is prevalent over a large portion, if not all, of the Project area and, therefore, the area is not suitable for turbine construction.<sup>49</sup> However, all of the studies conducted on the Project site to date, which include studies performed by ODNR, reveal that is not true. Applicant's subsurface exploration found that the site is suitable for construction and operation of the proposed Project. While the bedrock at the Project site consists of both shale and limestone, the vast majority of the proposed turbine sites are located to the east and south in the Ohio Shale Formation where the underlying bedrock is shale. Shale is not prone to karst development and is also not typically conducive to well development due to poor yields.<sup>50</sup> It is only in the extreme Northwestern portion of the Project area, where the underlying bedrock formations consist of limestone, that a site may be susceptible to karst features such as voids and other solution cavities.<sup>51</sup> However, the subsurface geotechnical investigation boring logs revealed only a couple borings that advanced through limestone bedrock that exhibited potential voids within the limestone and these voids appeared to

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<sup>48</sup> App. Ex. 1 at Ex. E; App. Ex. 39 at 3-4; App. Ex. 38 at 3-4, Att. AW-2; App. Br. at 27-28..

<sup>49</sup> BSBO/Residents Br. at 12-29.

<sup>50</sup> App. Ex. 38 at 5; App. Ex. 39 at 5.

<sup>51</sup> App. Ex. 1 at 80, 82, Ex. E; App. Ex. 38 at 5-6.

be limited to less than two feet in vertical extent, with a total of seven turbine locations having a moderate to high probability of karst development.<sup>52</sup>

BSBO/Residents' view is that in order to be "sufficiently protective against karst threats, when there is carbonate bedrock present below, or adjacent, one should assume that it is karstified."<sup>53</sup> BSBO/Residents submit that "steps should be taken to characterize the geologic conditions to look for karst in order to prevent environmental impacts."<sup>54</sup> What they fail to acknowledge is that, as provided in the Application and Stipulation, steps have and will be taken to ensure that the facility complies with the statute and the ground water is protected.

In addition, BSBO/Residents state that if karst is present in the area, groundwater could quickly flow through the open karst features and, if contaminated by turbine construction, carry the contaminants into nearby wells even if they are 1,371 feet away.<sup>55</sup> Based on the studies performed prior to construction, the record reflects that, if it is determined reasonable and appropriate, those areas that may be near karst features may be grouted in order to provide foundation support.<sup>56</sup> However, BSBO/Residents theorize that grouting the karst cavities under turbine foundations to promote foundation stability could threaten the groundwater supplies with contamination by blocking the natural drainage of surface waters into the cavities and may increase karst collapse elsewhere in the area.<sup>57</sup> To the contrary, the record reflects that grouting is a commonly used construction technique in similar geologic areas, and has consistently been utilized safely.<sup>58</sup> The record supports the determination that construction of the proposed turbines should have a minimal impact on the quality, availability, and/or movement of groundwater in the Project area.<sup>59</sup> BSBO/Residents offer no evidence to suggest that construction of the turbines will have any effect on groundwater. Instead, they suggest a parade of horrors may occur that does not even rise to the level of speculation.

BSBO/Residents are also concerned about the location of several turbines in Source Water Protection Areas ("SWPA").<sup>60</sup> However, these concerns have no basis. BSBO/Residents base

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<sup>52</sup> App. Ex. 39 at 5, 7.

<sup>53</sup> BSBO/Residents Br. at 19.

<sup>54</sup> *Id.* at 14.

<sup>55</sup> *Id.* at 22.

<sup>56</sup> App. Ex. 1 at 80, 82, Ex. E; App. Ex. 38 at 5-6.

<sup>57</sup> BSBO/Residents Br. at 20, 22-23.

<sup>58</sup> Tr. Vol. VI at 770-771; Tr. Vol VIII at 1074, 1080.

<sup>59</sup> App. Ex. 39 at 5.

<sup>60</sup> BSBO/Residents Br. at 12

their assumption on the faulty premise that just because the Applicant noted the fact that construction of the Project does not constitute an activity that is restricted by regulations, the Project will be constructed in a manner that could harm the SWPAs. Contrary to their assumption, the Applicant has committed to implement BMPs during construction and operation of the turbines and associated facilities that will protect against negative impacts to the SWPAs.<sup>61</sup> In addition, the Applicant has committed that the geotechnical engineer will examine all foundation designs and compatibility with the supporting soil at each turbine site, and approve the work prior to placement of foundation components.<sup>62</sup> This commitment is reinforced with Stipulation Condition 7 that requires, in part, that 30 days prior to the preconstruction conference Firelands shall submit:

- (1) Detailed engineering drawing of the final Project design so that Staff can determine that the final design is in compliance with the Certificate.
- (2) The detailed engineering drawings for the final Project design and foundation design shall account for karst topography and include the identity of the registered professional engineer(s), structural engineer(s), or engineering firm(s), licensed to practice engineering in the state of Ohio who reviewed the approved designs.<sup>63</sup>

BSBO/Residents proffer concerns about flooding in the Project area.<sup>64</sup> However, the record clearly states that there are no turbine sites proposed within designated 100-year floodplains.<sup>65</sup> As a safeguard, Stipulation Condition 17 requires that, prior to construction, either a copy of a floodplain permit be provided if it is later found to be necessary for construction or a copy of correspondence with the floodplain administrator showing that no permit is necessary be provided.<sup>66</sup>

BSBO/Residents submit that, if the Board grants the Applicant's certificate, it is important that an adequate geotechnical and hydrogeological investigation, including borings and dye tracing, be performed to protect the nearby wells, because it is important to have a specific understanding of the movement of water at each site.<sup>67</sup>

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<sup>61</sup> App. Ex. 1 at 77-78, Ex. E; App. Ex. 39 at 6.

<sup>62</sup> App. Ex. 1 at 81, Ex. E.

<sup>63</sup> Jt. Ex. 1 at 3.

<sup>64</sup> BSBO/Residents Br. at 23.

<sup>65</sup> App. Ex. 1 at 79, Ex. E.

<sup>66</sup> Jt. Ex. 1 at 17.

<sup>67</sup> BSBO/Residents Br. at 20, 22-23, 28.

Dr. Sasowsky, however, testified that he is not aware whether investigative techniques, such as dye tracing, are even standard practice related to construction projects.<sup>68</sup> When questioned about these investigative techniques, he stated, “Well, I don’t know whether I’ve recommended them, but I think I have mentioned some that could give answers that would be useful.”<sup>69</sup> BSBO/Residents own witnesses could not state that these extraordinary measures were even recommended. As detailed above and reflected in Stipulation Condition 7, the Stipulating parties agree to have a registered professional geotechnical engineer consider karst topography in the final engineering and foundation design.<sup>70</sup> BSBO/Residents maintain that turbine construction on any site where karst features are found or where groundwater supplies are threatened should be prohibited. Further, they assert the use of grout in karst openings and use of blasting should be banned.<sup>71</sup> These contentions are ironic considering literature reviewed by Dr. Sasowsky to complete his testimony states that grouting is an effective mitigation measure to deal with karst and once completed karst need not even be characterized,<sup>72</sup> and, despite indicating familiarity with the Project area, Dr. Sasowsky was not aware of the existence of the large quarry and its blasting operations.<sup>73</sup> The same literature also references a 175-turbine project built in Ohio where risk of karst was encountered.<sup>74</sup>

BSBO/Residents incorrectly believe that the Application only provides a general promise to conduct subsurface exploration and a vague assurance that Firelands will stabilize the turbine foundations if karst features are found.<sup>75</sup> All commitments in the Application, as enhanced by the safeguards in the Stipulation, ensure that the facility will represent the minimum adverse environmental impact and serve the public interest, in compliance with R.C. Sections 4906.10(A)(3) and (6). Moreover, the Board’s statutory obligation to investigate and enforce compliance with all certificate conditions ensures that the turbine sites will not affect the subsurface features so as to adversely impact the community’s water supply.

On the contention that the Applicant’s witnesses presented two different numbers of turbines in potential karst regions (6 and 20), those numbers were both based on datasets provided

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<sup>68</sup> Tr. Vol. VIII at 1071.

<sup>69</sup> *Id.* at 1070.

<sup>70</sup> Jt. Ex. 1 at 3.

<sup>71</sup> BSBO/Residents Br. at 29.

<sup>72</sup> Tr. Vol. VIII at 1079-81, referencing App. Ex. 87.

<sup>73</sup> *Id.* at 1074.

<sup>74</sup> *Id.* at 1081-82.

<sup>75</sup> BSBO/Residents Br. at 20-21.



by ODNR for potential karst areas. However, since those initial desktop evaluations for potential karst, field geotechnical borings were conducted at turbine locations and found only seven turbines with a moderate to high probability of karst development, and those features were minimal in size. All recommendations from the registered professional geotechnical engineer will be followed, including potential additional analysis at those locations along with construction mitigation techniques such as grout injection where necessary.<sup>76</sup>

**C. As supported by the Stipulation and the record, the setbacks mandated for the turbines comply in all respects with the R.C. and O.A.C. requirements.**

BSBO/Residents attempt to argue that the setback requirement set forth in Board's rules should be extend to 1,650 feet by intentionally misconstruing the Nordex manufacturer's safety zone that applies to situations where a fire might occur at a turbine. BSBO/Residents attempt to create the illusion that the reason for the 1,650 feet recommendation in the manual was because of propelling blade pieces during a fire rather than the fire as described by Nordex in its explanation.<sup>77</sup> Such hypotheticals are neither based on fact or any evidence in the record.

Applicant has committed to continue to take all necessary precautions to ensure the safe operations of the facility, including the appropriate setback distances.<sup>78</sup> As the record reflects, all 87 potential turbine sites will comply with the requirements in R.C. 4906.201 and the O.A.C., such that: the distance from the turbine base to the property line of the wind farm property will be at least 1.1 times the total height of the turbine structure as measured from the tower's based to the tip of a blade at its highest point; and the turbine will be at least 1,125 feet in horizontal distance from the tip of the turbine's nearest blade at 90 degrees to the property line of the nearest adjacent property.<sup>79</sup> Thus, depending on the turbine model chosen, the setback to property lines will be between 1,355 and 1,384 feet.<sup>80</sup> The O.A.C. also requires a setback to electric transmission lines, gas pipelines, gas distribution lines, hazardous liquid pipelines, and public roads. All 87 proposed turbine locations meet the setback to known gas pipelines, gas distribution lines, electric transmission lines, and hazardous liquid pipelines for all turbine models under consideration. The Applicant will only build turbines at a given site that comply with the O.A.C. setback requirements

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<sup>76</sup> Tr. Vol. VI at 764.

<sup>77</sup> App. Ex. 32, Ex. NP-2.

<sup>78</sup> App. Ex. 31 at 8.

<sup>79</sup> App. Ex. 1 at 192.

<sup>80</sup> App. Ex. 31 at 12.

for non-participating property lines, public roads, gas pipelines, gas distribution lines, electric transmission lines, and hazardous liquid pipelines.<sup>81</sup> The turbine setback will protect homes and roadways from the remote possibility of blade shear or ice throw.

**D. The Stipulation and record enable the Board to determine that Applicant will comply with the shadow flicker requirements in the O.A.C., thus, supporting a determination by the Board that the facility represents the minimum adverse environmental impact and is in the public interest under R.C. Sections 4906.10(A)(3) and (6), respectively.**

BSBO/Resident argue that, while Firelands has submitted shadow flicker models to the Board, it has “failed to comply with the 30-hour per year standard.”<sup>82</sup> Just to be clear, BSBO/Residents, while acknowledging that the required shadow flicker studies have been submitted to the Board that will enable the Board to determine the probable environmental impact and ensure that the facility represents the minimum adverse environmental impact under R.C. Section 4906.10(A)(3), is predicting that the Applicant will not comply with the conditions in the Stipulation or O.A.C. Rule 4906-4-09 (H)(1)<sup>83</sup> However, as supported by the record and the Stipulation, the Applicant has committed to comply with this requirement.<sup>84</sup> In fact, more importantly, the Board has the authority under the statute to enforce the conditions in the Stipulation, should Firelands not follow this requirement.

It is also significant that, as the record reflects, the shadow flicker studies were conducted using a conservative, maximum-case scenario, which incorporated various assumptions including: that all 87 turbines would be constructed (when only 52 to 71 will be constructed); that the turbines are in continuous operation during daylight hours (which is not the case as the blades do not spin below the cut-in speed); and sensitive receptors were assumed to have only windows and no screening of trees or buildings.<sup>85</sup> In that the studies were conservative and overestimated the actual shadow flicker that may result from a given turbine, any prediction by BSBO/Residents as to whether or not a given turbine will comply with the requirement is premature.

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<sup>81</sup> App. Ex. 1 at 193.

<sup>82</sup> BSBO/Residents Br. at 32.

<sup>83</sup> O.A.C. Rule 4906-4-09 (H)(1) establishes the requirement that the facility shall be operated so that shadow flicker levels do not exceed 30 hours per year at any non-participating receptor.

<sup>84</sup> App. Ex. 1 at 3.

<sup>85</sup> App. Ex. 1 at 91, 95, Ex. H; App. Ex. 31 at 5; App. Br. at 39.

Contrary to the claims of BSBO/Residents, the Project was properly designed with 87 turbines and, as the Applicant attests, over a dozen of those turbines will not be constructed; therefore, if it is not possible to operate a certain turbine so that it complies with the shadow flicker requirement, that turbine will be one of the turbines that will not be constructed. While BSBO/Residents misunderstand and complain about the fact that Stipulation Condition 34 requires the Applicant to file another shadow flicker study 30 days prior to construction, in reality, this condition is a good enforcement provision required by the Board. Moreover, as acknowledged by BSBO/Residents, there are other ways to comply with the shadow flicker operational requirement short of not constructing the turbine – most notably vegetation screening, window treatments, or curtailment of certain turbines operations during selected times.<sup>86</sup>

Thus, as evidenced for the most part by their own admissions on brief, BSBO/Residents assertions that the Stipulation and record does not enable the Board to determine that the facility represents the minimum adverse environmental impact and is in the public interest under R.C. Sections 4906.10(A)(3) and (6) is groundless.

**E. The Stipulation and record enable the Board to determine that the facility will efficiently and reliably produce electricity and is in the public interest under R.C. Sections 4906.10(A)(6).**

As noted previously, BSBO/Residents do not dispute that the record enables the Board to make its determination that the facility is “consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems and that the facility will serve the interests of electric system economy and reliability” in accordance with R.C. Section 4906.10(A)(4). There is also no dispute on the record that, as an owner, operator, and/or user of the bulk power system (“BPS”), Firelands is subject to compliance with the federal government’s approved reliability standards that are developed and enforced by the North American Reliability Corporation (“NERC”). Generators, such as Firelands, that want to interconnect with the BPS located in the PJM control area are required to submit an interconnection application for review of system impacts. PJM, as the RTO charged with planning for upgrades, studies the interconnection request and determines whether construction of expansions and/or upgrades of the PJM transmission system are needed to maintain compliance with reliability

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<sup>86</sup> BSBO/Residents Br. at 33; App. Ex. 1 at 99.

criteria with the addition of the requested interconnection generation source. The NERC reliability standards are included as part of the system evaluation conducted by PJM.<sup>87</sup>

The record and Stipulation Conditions 12 and 13 support a determination that the facility is consistent with regional plans for the electric power grid and that the facility will serve the interests of electric system economy and reliability. Specifically, Stipulation Condition 12 requires that, prior to construction, the Applicant have a signed Interconnection Service Agreement with PJM that “includes construction, operation, and maintenance of system upgrades necessary to integrate the proposed generation facility into the regional transmission system reliably and safely.” Further, Stipulation Condition 13 requires that the facility will inject no more than 297.7 MW into the BPS at any time.<sup>88</sup>

Regardless of the evidence in the record to the contrary, BSBO/Residents continue to assert that, based on the view of their lay witness, Mr. Schreiner, wind farms are not reliable sources of electricity.<sup>89</sup> A review of the points raised by BSBO/Residents on brief reveal that Mr. Schreiner does not have the fundamental understanding of how PJM or the grid operates.

For example, Mr. Schreiner refers to the Emerson Creek Wind Facility as a “small energy facility” that “introduces additional conductors and cabling, which reduces the amount of electricity reaching the grid and which increase energy production costs.”<sup>90</sup> However, this Project is not a “small energy facility.” It is, in fact, a large utility-scale facility. This wind-powered facility will not increase energy production costs because, in light of the fact that Firelands has no fuel costs, it has zero marginal costs. The PJM market is structured so that generators bid into the market and PJM selects bids until demand is met, paying all generators the same price as the highest accepted bid. Due to this market structure, and Firelands’ lack of marginal costs, Firelands will not cause an increase in the price of the highest accepted bid. In the BSBO/Residents brief, and in Mr. Schreiner’s testimony, it was argued that wind energy is more expensive than non-intermittent energy sources. If Mr. Schreiner intended to argue that the levelized cost of energy for Firelands will exceed that of another generation source, that is irrelevant to the PJM market as a whole, and if it were true, would impact only the party that owns the project and is responsible for the costs of the project.

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<sup>87</sup> Staff Ex. 1 at 60.

<sup>88</sup> Jt. Ex. 1 at 4.

<sup>89</sup> BSBO/Residents Br. at 36.

<sup>90</sup> *Id.* at 36.

In addition, BSBO/Residents, relying on Mr. Schreiner's opinion, believe that the mere fact that the wind resource is intermittent makes it unreliable – which is not true.<sup>91</sup> Further, BSBO/Residents hypothesize that “[i]f and when more transient energy sources displace larger stable sources, the transient sources will lack the ability to provide for this stable backup of power.”<sup>92</sup> As explained by Applicant witness, Mr. Rana, Senior Manager, Transmission and Interconnections with Apex Clean Energy, Inc., there are multiple entities that are responsible for overseeing regional as well as national grid reliability, each having multiple guidelines, reliability standards, and manuals that govern the compliance requirements for generation resources interconnecting to the grid. Mr. Rana referenced NERC standards that govern when generators can connect or disconnect from the grid. Just because a wind project is not producing power during low wind conditions, does not mean it will disconnect from the grid. Specifically, NERC Reliability Standards PRC-024 and PRC-025 govern the minimum generator frequency, voltage protection, and load-responsive settings generator owners interconnecting to the BPS must incorporate and comply with through the lifetime of their operation. PRC-024 requires the project to set its operational parameters and electrical relays such that the project and its turbines remain connected to the grid during defined frequency and voltage excursions, generally understood as power spikes. PRC-025 requires the project to incorporate load-responsive protective relays associated with generation facilities at a level to prevent unnecessary tripping of generators during a system disturbance. Compliance with PRC-025 supports the system during the transient phase of a disturbance, and establishes criteria for the project to set load-responsive protective relays such that individual turbines may provide reactive power within their dynamic capability during transient time periods to help the system recover from the voltage disturbance.<sup>93</sup> All large generators, including the Emerson Creek Wind Facility, are held liable by the Federal energy Regulatory Commission (“FERC”) and NERC to maintain a certain power factor at interconnection to maintain grid reliability. The local RTO, in this case PJM, is then in charge of maintaining grid reliability, including potentially calling upon large generation plants, the Emerson Creek Wind Facility included, to over excite or under excite as needed to meet the grid's power factor needs.

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<sup>91</sup> *Id.* at 36-37.

<sup>92</sup> BSBO/Residents Br. at 36.

<sup>93</sup> App. Ex. 90 at 6-7.

In suggesting that events in California are relevant to an evaluation of Emerson Creek, BSBO/Residents and Mr. Schreiner also do not understand that the market operated by the California Independent System Operator (“CAISO”) is different than the market operated in Ohio by PJM – instead believing that, as renewable energy facilities come online in Ohio and displace traditional energy sources, Ohio will face the same reliability problem that California had.<sup>94</sup> However, Applicant witness Mr. Rana provided unrefuted expert testimony that such is not the case, explaining that the market activities of PJM and CAISO, and their respective mix of intermittent resources significantly affect the concept of resource adequacy in each RTO. Mr. Rana explained that there are no material differences in reliability standards applicable to intermittent resources since all RTOs must comply with NERC and regional reliability standards with the aim of achieving the same goal of maintaining grid reliability within their respective resource adequacy constructs. However, Mr. Rana expounded that, from a generation mix perspective, CAISO and PJM are vastly different (i.e., solar accounts for ~31% of CAISO generation mix, while wind accounts for ~2% of the CAISO generation mix. In PJM, solar accounts for ~1.7% of the PJM generation mix, while wind accounts for ~5%.) The stark differences between each RTO’s generation mix affects the concept of resource adequacy in each RTO; thus, the RTOs cannot be equated. In addition, from a market standpoint, PJM and CAISO are very different. PJM operates regional organized markets under a dedicated footprint and is, therefore, responsible for maintaining and scheduling resources within a defined territory. Conversely, CAISO runs an energy imbalance market (“EIM”) that consists of multiple balancing authorities that includes portions of Arizona, California, Idaho, Nevada, Oregon, Utah, Washington, and Wyoming among others. This is materially different than PJM because it means CAISO’s markets are available for imports and exports to and from entities outside of its ISO territory. As a result of the EIM, CAISO may be reliant on imports from other balancing authorities during peak demand hours whereas PJM serves its peak demand using resources within its ISO territory.<sup>95</sup>

While Mr. Schreiner is certainly entitled to have an opinion on the Project and whether he views wind as a desirable resource as a consumer, he is not an expert on the grid, system reliability, PJM, NERC, FERC, or any other authority with expertise in this area. BSBO/Residents should

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<sup>94</sup> BSBO/Residents Br. at 36-37.

<sup>95</sup> App. Ex. 90 at 7-8.

not be permitted to hold Mr. Schreiner and his opinions out as expert testimony. Mr. Schreiner's opinion and, consequently, BSBO/Residents' arguments on brief, are not grounded in any direct experience pertaining to the Project's interconnection with the PJM transmission grid or its participation in the PJM wholesale markets, as Mr. Schreiner does not offer any testimony regarding the specific generation facility proposed by Firelands nor does he refer to any information present in any regional plans. As explained in Applicant's brief, Mr. Schreiner's claim to expertise on "the operation of the PJM grid" rests on the contention that "my knowledge of how the grid operates is significantly higher than the average person" and his experience with operation of a nuclear generation plant.<sup>96</sup> Mr. Schreiner has never worked for PJM or any other RTO, and his alleged experience with the PJM grid rests on his work when he was a control room operator at a nuclear generation facility in Ohio from 1977 to 1981.<sup>97</sup> The fact is, there were no intermittent energy resources and no PJM back in the 1970s when Mr. Schreiner was managing the control room for a nuclear facility. The experience of operating a control room in the 1970s does not equate to experience with an intermittent energy resource.

Mr. Schreiner has not worked on the PJM interconnection process for any generation resource,<sup>98</sup> which is the relevant process whereby PJM "ensure[s] that a given resource will not cause violations of applicable NERC [reliability] standards, as well as PJM's own reliability safeguards."<sup>99</sup> Mr. Schreiner was not aware of whether PJM is engaged in any efforts to ensure reliability even if intermittent sources are connected to the transmission grid.<sup>100</sup> As for the reliability standards themselves, Mr. Schreiner was under the impression that intermittent energy sources "connect and disconnect from the grid," which, as explained above, is not true based on operating manuals PRC-024 and PRC-025, which do not allow for the connection and disconnection of generation facilities, a requirement enforced by NERC.<sup>101</sup> When asked about these operating manuals, Mr. Schreiner was not aware of them.<sup>102</sup> Mr. Schreiner also acknowledged that he is not familiar with the differences or similarities between the tariffs governing operation of PJM versus the CAISO, and does not know how the CAISO manages

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<sup>96</sup> Tr. Vol. VII at 847; LR Ex. 1 at 4; App. Br. at 13-14.

<sup>97</sup> Tr. Vol. VII at 847-849; LR Ex. 1 at 4; App. Br. at 13.

<sup>98</sup> Tr. Vol. VII at 852-853.

<sup>99</sup> App. Ex. 90 at 4.

<sup>100</sup> Tr. Vol. VII at 849-851.

<sup>101</sup> LR Ex. 1 at 6.

<sup>102</sup> Tr. Vol. VII at 854.

capacity resources.<sup>103</sup> The Applicant notes, however, that, regardless of this lack of foundation or knowledge, BSBO/Residents riddled their brief with misinformation and unsubstantiated conjecture on these very topics.

While Mr. Schreiner's various roles in operating a nuclear plant undoubtedly involved technical engineering, that experience with management of a nuclear generation resource is not directly relevant to operation of an energy source such as a wind facility or to the BPS as a whole and BSBO/Residents attempt to hold his opinion out as expert testimony, rather than an opinion provided by a consumer is inappropriate and misleading. By contrast, Applicant's rebuttal witness Mr. Rana does have the relevant expertise and specific factual knowledge to attest that the Project will not negatively impact the reliability of the grid and that Mr. Schreiner failed to provide a valid analysis showing it would drive up costs in PJM's wholesale market.<sup>104</sup>

**F. As supported by the Stipulation and the record, the facility is not expected to impact TVs or RTK Systems; but, in the unlikely event it does, the Applicant will mitigate such impacts.**

An analysis of the effect, if any, the construction and operation of the Project would have on TV reception or Real-time Kinematic ("RTK") Global Positioning System Locator systems revealed that no turbine is anticipated to adversely affect these systems. However, if they are affected, the Applicant has committed to work with residents to resolve any issues.<sup>105</sup>

Specifically, for TV broadcast signals, the Applicant set forth in the record some of the options available for mitigation including, but not limited to: relocation of the antenna; installation of a better antenna with a higher gain; or cable or satellite TV.<sup>106</sup> If a resident requires cable or satellite TV in order to replace a digital signal that is impaired by the Project, the Applicant commits to paying the monthly subscription fee for cable or satellite TV.<sup>107</sup>

There is a remote possibility that wind turbines could cause blockage at the base station on RTK systems in a particular area for mobile farming vehicles. In the unlikely event that the wind turbines cause blockage at the base station on an RTK system, the Applicant will fund the purchase and installation of a repeater station.<sup>108</sup>

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<sup>103</sup> *Id.* at 855-856.

<sup>104</sup> App. Ex. 90 at 5-6.

<sup>105</sup> App. Ex. 1 at 101; App. Ex. 44 at 3-4, Ex. I; App. Ex. 31 at 10; App. Br. at 34-35, 51.

<sup>106</sup> App. Ex. 1 at 101.

<sup>107</sup> Tr. Vol. I at 41, 11, 16-22.

<sup>108</sup> App. Ex. 31 at 10.



While BSBO/Residents acknowledge that the Applicant has committed to pay for monthly subscription fees for cable or satellite TV service if such mitigation measure is necessary they maintain that the certificate issued by the Board should specifically include a condition that specifically addresses this commitments.<sup>109</sup> In addition, BSBO/Residents recognize that the Applicant has committed on the record to fund the purchase and installation of a repeater station for an RTK system if necessary, but they would like Stipulation Condition 38 to specifically state that RTK systems are protected.<sup>110</sup>

The Applicant respects the enforcement authority of the Board that is set forth in the statute and understands that Firelands' commitments made on the record to resolve any issues with TV reception or RTK systems are subject to such enforcement mechanism if Firelands fails to comply with these commitments. The Applicant notes that there are a number of commitments that the Applicant is required to comply with by virtue of Stipulation Conditions 1 and 2, and the record in this case where the Applicant has stated commitments that are not specifically listed in the Stipulation Conditions.<sup>111</sup> For example, see the list of some of the commitments for wildlife set forth in the Applicant's brief.<sup>112</sup> In light of this, the Applicant does not believe it is necessary to modify the Stipulation by adding additional conditions as requested by BSBO/Residents. If BSBO/Residents had attended any of these Stipulation negotiations to make these requests, the Applicant would have been amenable to making these additions.

**G. The Stipulation and record enable the Board to determine that the visual impact from the facility represents the minimum adverse environmental impact and is in the public interest under R.C. Sections 4906.10(A)(3) and (6), respectively.**

BSBO/Residents complain that the turbines will "inflict a visual blight on the Residents" and the "rest of the community" and, therefore, the Project does not represent the minimum adverse environmental impact under R.C. Section 4906.10(A)(3) or serve the public interest under R.C. Section 4906.10(A)(6).<sup>113</sup>

The Applicant notes that, as reflected in the record, BSBO/Residents, while speaking on their own behalf, do not speak on behalf of the "rest of the community." The fact is that, as

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<sup>109</sup> BSBO/Residents Br. at 39.

<sup>110</sup> *Id.* at 40.

<sup>111</sup> Jt. Ex. 1 at 2-3.

<sup>112</sup> App. Br. at 47-48.

<sup>113</sup> BSBO/Residents Br. at 40.

evidenced by the numerous community members that testified at the local hearing and filed comments in the docket supporting the Project, not all members of the community agree with BSBO/Residents.<sup>114</sup> In fact, a great number of residents in the area do not view the Project as a “visual blight.” These positive residents include the local residents Tom Yingling and Kevin Erf who are Stipulating Parties in this case. The supportive residents clearly see the many benefits that the Project brings to the community, which include, but are not limited to: tax payments to schools and local governments; additional income for local landowners and businesses; new jobs in the area and the state of Ohio; use of Ohio manufacturing; preserving the environment through a carbon-free generation source; local generation of energy; diversification of electric power; and maintaining current land use.<sup>115</sup>

As for compliance with R.C. Section 4906.10(A)(3) and the ability of the Board to determine the minimum adverse environmental impact, the record and the Applicant’s brief are replete with all of the commitments and requirements that enable the Board to adopt the Stipulation and issue a certificate to Firelands. For example, specifically referencing visual impact, the record reflects that the setbacks imposed on property lines and residences will not only mitigate sound and shadow flicker at non-participating residences, but they will lessen any potential visual impact of the turbines.<sup>116</sup>

BSBO/Residents are certainly welcome to have their opinion, but their opinion does not equate to everyone’s opinion. Moreover, their position certainly does not accurately reflect the evidence record in this case and the fact that the requisite information has been provided that enables the Board to make its determinations that the facility represents the minimum adverse environmental impact under R.C. Section 4906.10(A)(3) and serves the public interest under R.C. Section 4906.10(A)(6) – thus, calling for the Board’s adoption of the Stipulation and issuance of a certificate to Firelands.

**H. The Stipulation and record enable the Board to determine that the turbines will be located areas that avoid or mitigate the potential impact to avian and bat species, ensures that the probable environmental impact has been determined, that the facility represents the minimum adverse environmental impact, and that the facility**

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<sup>114</sup> Local Hearing Tr. (Aug. 20, 2020) at 45, 55, 83, 94, 103, 110, 128, 132, 135, 139, 142, 163, 170, 176, 196, 218, 222, 224, 236, 239; App. Br. at 58.

<sup>115</sup> App. Br. at 58-63.

<sup>116</sup> App. Ex. 31 at 12.

**is in the public interest under R.C. Sections 4906.10(A)(2), (3), and (6).**

When reviewing BSBO/Residents' brief, which has a variety of inaccurate and misleading conjectures, it is important to keep in mind the undisputed fact that numerous avian and bat studies were completed through the Project area and surrounding areas between 2009 and 2019. These studies were designed and completed in accordance with Ohio Department of Natural Resources' ("ODNR's") *On-Shore Bird and Bat Pre-and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio* ("ODNR Protocols"), United States ("U.S.") Fish and Wildlife Service's ("USFWS") *Land-Based Wind-Energy Guidelines* ("USFWS Guidelines"), as well as recommendations from USFWS and ODNR.<sup>117</sup> The survey efforts conducted by the Applicant for all avian and bat species in the Project area were, at a minimum, in accordance with or, in most instances, in exceedance of USFWS and ODNR guidelines. Based on these survey results, USFWS and ODNR have not requested additional survey information and have made recommendations, which have been included as conditions in the Stipulation to ensure minimum probable environmental impact.

**1. The bat species surveys conducted by the Applicant enable the Board to determine the probable environmental impact and ensure that the facility represent the minimum environmental impact.**

BSBO/Residents assert that the Board should deny the Application for lack of adequate bat survey information, including the lack of credible data on estimated bat deaths.<sup>118</sup> However, the evidence of record reveals that more bat survey data was presented and collected for the Firelands Project than any other project that has been certificated in Ohio.<sup>119</sup> Moreover, experts at USFWS and ODNR agreed and did not recommend any additional data be collected. The fact is, Firelands provided data from over 200 post-construction monitoring studies to estimate the potential impact of the Project on bats.<sup>120</sup> Conversely, BSBO/Residents' witness, Dr. Smallwood, relied on data from a single wind project in Canada located on an island (Wolfe

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<sup>117</sup> App. Ex. 1 at 120-121; App. Ex. 1 at 121, Exs. R- T, V-X; App. Ex. 32 at 4-17; App. Ex. 47; App. Br. at 23.

<sup>118</sup> BSBO/Residents Br. at 44.

<sup>119</sup> *In re Application of Hog Creek Wind Farm, LLC*, Case No. 09-277-EL-BGN; *In re Application of Paulding Wind Farm, LLC*, Case No. 09-980-EL-BGN; *In re Application of Blue Creek Wind Farm, LLC*, Case No. 09-1066-EL-BGN; *In re Application of Paulding Wind Farm II, LLC*, Case No. 10-369-EL-BGN; *In re Application of Hog Creek Wind Farm, LLC*, Case No. 10-654-EL-BGN; *In re Application of Northwest Ohio Wind Energy, LLC*, Case No. 13-197-EL-BGN; *In re Application of Paulding Wind Farm IV, LLC*, Case No. 18-91-EL-BGN.

<sup>120</sup> App. Ex. 32 at 24, FN 9, <https://awwi.org/resources/awwic-bat-technical-report/>;  
[https://www.west-inc.com/wp-content/uploads/2020/06/WEST\\_2019\\_RenewWildlifeFatalitySummaries.pdf](https://www.west-inc.com/wp-content/uploads/2020/06/WEST_2019_RenewWildlifeFatalitySummaries.pdf)

Island), and inappropriately adjusted Wolfe Island data by applying bias correction factors from a completely different environment, hilly grasslands in California.<sup>121</sup> The record reflects that the Applicant's studies and resulting estimates of impacts to bats relied on many more studies than did BSBO/Residents' witness. Applicant utilized a multitude of mortality studies from agricultural areas in the Midwest similar to Ohio and a fatality estimator recommended by the United States Geological Service ("USGS") and the Bats and Wind Energy Cooperative ("BWEC").<sup>122</sup>

BSBO/Residents claim that the number of estimated bat mortalities, as calculated by Dr. Smallwood, will damage the populations of bats needed for agriculture and other purposes.<sup>123</sup> However, Dr. Smallwood does not use statistical methods that are the best available methods. As verified by Dr. Rabie, the USGS, USFWS, and other agencies recommend the use of GenEst to estimate bat mortality. In fact, Dr. Rabie conducted an analysis of Wolfe Island data using methods recommended by the USGS (GenEst), and calculated much lower estimates of bat mortality from Wolfe Island than Dr. Smallwood. As described in Dr. Rabie's testimony, Dr. Smallwood's analyses of Wolfe Island are incorrect, and should not be trusted.<sup>124</sup> Wolfe Island is an island, while the Emerson Creek Wind Facility is located on the mainland of Ohio. Dr. Smallwood utilized bias correction factors from Altamont pass in California to calculate an expected fatality estimate for the Emerson Creek Wind Facility; however, data from California are not representative of expected conditions in Ohio. Dr. Smallwood's method for estimating mortality did not rely on statistical methods recommended by USGS and BWEC, and made the assumption that mortality data from an island in Canada, adjusted using bias corrections from hilly grasslands in California, would be representative of mortality in the Project area.<sup>125</sup> The Board should not view data from an island or from California as representative of an agricultural, mainland wind project in Ohio.

The assertions of BSBO/Residents that the Project will kill an estimated 14,620 bats per year<sup>126</sup> is flawed and incorrect.<sup>127</sup> Bat mortality rates from 36 post-construction monitoring studies

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<sup>121</sup> App. Ex. 89 at 8.

<sup>122</sup> *Id.* at 3.

<sup>123</sup> BSBO/Residents Br. at 44.

<sup>124</sup> App. Ex. 89 at 8-12.

<sup>125</sup> Tr. Vol. VIII at 1030-33.

<sup>126</sup> BSBO Ex. 2 at 36.

<sup>127</sup> App. Ex. 89 at 8-12.

in the Midwest have a median of 6.2 bats / MW / Year, and have ranged widely from 0.4 – 61.8 bats / MW / Year.<sup>128</sup> Precise predictions of bat mortality are not possible and are not supported by available scientific studies. The highest bat mortality rates have occurred in largely treeless landscapes in Iowa, indicating that the presence of forest does not result in increased bat mortality rates. It is important to note that, unlike the safeguards committed to in the Application, required under the Stipulation, and recommended by USFWS in the technical assistance letter (“TAL”), many of the projects that record higher bat mortality rates used to create the range of .04-61.8 bats/MW/Year in the Mid-west operate without any feathering or curtailment designed to minimize bat mortality.<sup>129</sup> The purpose of the TAL, which USFWS has determined are adequate, is to avoid take of listed species. By implementing the measures in the TAL or a Habitat Conservation Plan (“HCP”), the Applicant will be reducing any potential collision risk and mortality is anticipated to be below the average presented above.

BSBO/Residents believe that, if the Project is approved, the Board should “require additional conditions to compensate for the outdated, ineffective conditions in the TAL.”<sup>130</sup> BSBO/Residents choose to disregard the expertise and authority of both the USFWS and ODNR in favor of their own notions. However, the fact is that USFWS is the wildlife expert and should be trusted to develop TAL conditions that will avoid impacts to threatened and endangered bat species. USFWS reviewed the bat survey information collected for the Project and did not request any additional survey data. Thus, USFWS determined that adequate information was provided and accordingly provided the TAL. Therefore, contrary to comments of BSBO/Residents, the record does support a finding that the bat surveys reveal the probable environmental impact to bat species in compliance with R.C. Section 4906.10(A)(2).

Likewise, the record supports a finding that the Project represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of various alternatives, and other pertinent considerations as required under R.C. Section 4906.10(A)(3). BSBO/Residents insist that neither the TAL, the Application, nor the Stipulation contain meaningful discussion on how to minimize mortality to bat species. While they acknowledge that the TAL, if implemented to curtail turbine operation during bat migration may

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<sup>128</sup> App. Ex. 32 at 24, FN 9, <https://awwi.org/resources/awwic-bat-technical-report/>;  
[https://www.west-inc.com/wp-content/uploads/2020/06/WEST\\_2019\\_RenewWildlifeFatalitySummaries.pdf](https://www.west-inc.com/wp-content/uploads/2020/06/WEST_2019_RenewWildlifeFatalitySummaries.pdf)

<sup>129</sup> App. Ex. 1 at 159; Jt. Ex. 1 at 5.

<sup>130</sup> BSBO/Residents Br. at 44.

reduce expected bat mortalities, they refuse to acknowledge the breadth of evidence on the record that quantify this benefit.<sup>131</sup>

USFWS requires raising cut-in speeds to avoid impacts to Indiana and northern long-eared bats. Raising cut-in speeds is a well-established method that is accepted by wildlife agencies across the country for reducing mortality of all bat species. The TAL obtained from USFWS outlines measures the Project must implement to avoid the potential take of the Indiana and northern long-eared bat. These measures include feathering blades of all turbines below 6.9 meters per second (“m/s”) at night during the spring and fall migration periods, and during the summer maternity period at turbines located within 2.5 miles of an Indiana bat roost. The Project’s implementation of the USFWS recommended measures will also reduce the potential impacts of the Project to all other bat species, including tree bats during the spring and fall migration.<sup>132</sup> The Project may also elect to develop an HCP in the future and obtain an incidental take permit, which would require measures to minimize impacts to listed bat species, and mitigation for impacts.<sup>133</sup> Minimization measures within an HCP would require USFWS review and approval, and will reduce mortality of other bat species.<sup>134</sup>

As shown in the Fowler Ridge reports, which were also included in the testimony of the witness sponsored by BSBO, Dr. Smallwood, the mortality of all bat species was reduced by 50% in 2010 at Fowler Ridge when raising cut-in speeds to 5.0 m/s, and by 78% when raising cut-in speeds to 6.5 m/s. The mortality of all bat species was reduced by 36% by feathering turbine blades at 3.5 m/s, 57% by feathering turbine blades below 4.5 m/s, and 57% by feathering turbine blades below 5.5 m/s in 2011.<sup>135</sup> The TAL requires feathering turbine blades below wind speeds up to 6.9 m/s, thus, we could expected a greater than 78% reduction in “other” bat mortality if the Project follows the USFWS TAL guidelines.<sup>136</sup>

The Applicant takes issue with BSBO/Residents’ incorrect assertions regarding the adequacy of the TAL and whether its proposed mitigation measures for bats are adequate.<sup>137</sup> First,

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<sup>131</sup> *Id.* at 42-43.

<sup>132</sup> Tr. Vol. II at 222.

<sup>133</sup> *Id.* at 135.

<sup>134</sup> App. Ex. 32 at 25.

<sup>135</sup> [https://www.fws.gov/midwest/endangered/permits/hcp/FowlerRidge/pdf/AppendixA\\_FowlerRidgeWindFarmFinalHCP062713.pdf](https://www.fws.gov/midwest/endangered/permits/hcp/FowlerRidge/pdf/AppendixA_FowlerRidgeWindFarmFinalHCP062713.pdf)

<sup>136</sup> App. Ex. 32 at 24, FN12 at 57, [http://batsandwind.org/pdf/Good%20et%20al.%202012\\_Fowler%20Report.pdf](http://batsandwind.org/pdf/Good%20et%20al.%202012_Fowler%20Report.pdf); App. Ex. 5, Att. 2.

<sup>137</sup> BSBO/Residents Br. at 43-44.

contrary to BSBO/Residents assertions and as supported by the record, Firelands acoustic bat surveys did include the period with the greatest bat activity and the TAL curtailment period covers that time period.<sup>138</sup> Second, BSBO/Residents suggest using real-time acoustic detection system of bats with wind data; however, raising cut-in speeds is a well-established and proven means for reducing bat mortality. The real-time acoustic detection system cited by BSBO/Residents' witness Dr. Smallwood has only been tested at a single site and needs further testing before it is proven that it will work elsewhere. Whereas, the curtailment required by the TAL has been tested at dozens of sites and has been shown to be effective.<sup>139</sup> Third, while BSBO/Residents call for a plan that requires compensatory mitigation for the bats that curtailment fails to save, there is no need for mitigation because the TAL avoids the take of bat species listed as threatened or endangered. Fourth, BSBO/Residents believe that the ODNR Protocols are outdated, in particular noting that the protocols do not require that dogs be used for post-construction monitoring. Certainly, dogs could be used for monitoring carcasses; however, the absence of dogs in the ODNR Protocols does not mean that the protocols are deficient. Especially when post-construction monitoring by humans are likewise effective for monitoring carcasses. In fact, it is important to note that searcher efficiency, regardless of whether it is a human or dog conducting the search, is taken in to account when calculating estimates and a reliable estimator, such as GenEst, should be able to provide consistent fatality estimates across a range of searcher efficiencies.<sup>140</sup> Fifth, BSBO/Residents incorrectly assert that Firelands will not monitor fatalities at all turbines, when, in fact, the ODNR Protocols used by most developers in Ohio and by Firelands will require monitoring at all turbines during the first year of operation.<sup>141</sup> Sixth, in accordance with ODNR Protocols and Stipulation Condition 22, post-construction mortality monitoring is required for the first year after commercial operation of the Project and, depending on the results of the first season, may be required for a second season.<sup>142</sup> In addition, if an incidental take permit is obtained, the monitoring will be even longer. While BSBO/Residents believe that monitoring should occur for three years after operation, they point to no justification in the record as to why the ODNR Protocols for monitoring

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<sup>138</sup> App. Ex. 1 at Ex. X.

<sup>139</sup> App. Ex. 32 at 25,  
<https://tethys.pnnl.gov/sites/default/files/publications/Martin-et-al-2017.pdf>;  
<https://tethys.pnnl.gov/sites/default/files/publications/Arnett-et-al-2013.pdf>

<sup>140</sup> App. Ex. 89 at 18.

<sup>141</sup> App. Ex. 47.

<sup>142</sup> Jt. Ex. 1 at 6.

and the measured manner in which they are applied are not adequate – they simply want more data. Seventh, BSBO/Residents incorrectly assert that the fatality search radius required for post-construction monitoring is too small.<sup>143</sup> However, the record shows that the analyses used by Dr. Smallwood to arrive at this conclusion are flawed. Dr. Rabie’s analysis, which uses data from dog searches at a wind farm similar to the Emerson Creek Wind Facility that is located on flat tilled agricultural land, shows a much higher proportion of bats would occur within ODNR-required plot radius than Smallwood’s data from a California.<sup>144</sup> In fact, based on the ODNR Protocols, Ohio has some of the largest search radius for post-construction monitoring of any state.

The data from the post-construction monitoring will be provided to the experts at ODNR in accordance with Stipulation Condition 22 and the post-construction avian and bat monitoring plan.<sup>145</sup> In the event Staff and ODNR, in consultation with USFWS, determine that significant mortality, as defined in ODNR’s Protocols, has occurred to bats or birds, Stipulation Condition 23 establishes a process that ensures that appropriate mitigation plans and adaptive management strategies are in place to minimize risk to the species.<sup>146</sup> In addition to the safeguards and requirements in the Stipulation, the Applicant has incorporated the following safeguards and commitments in to the siting and operation of the Project: turbines will be placed in agricultural fields to avoid wooded areas that provide habitat for bats; turbines will be set back a minimum of 1,000 feet from suitable Indiana bat habitat within 2.5 miles of the documented Indiana bat roost or average of the identified roosts; blades of turbines within 2.5 miles of a documented Indiana bat roost, or the average of the identified roosts, will be feathered at wind speeds below 6.9 m/s from 30 minutes before sunset to 30 minutes after sunrise during summer (May 16 to July 31), unless otherwise authorized by ODNR or USFWS.<sup>147</sup> These safeguards, and other commitments in the Application and Stipulation support a finding that the facility represents the minimum adverse environmental impact to bat species.

**2. The bird surveys conducted by the Applicant enable the Board to determine the probable environmental impact and ensure that the facility represent the minimum environmental impact.**

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<sup>143</sup> BSBO/Residents Br. at 44.

<sup>144</sup> App. Ex. 89 at 15.

<sup>145</sup> Jt. Ex. 1 at 5.

<sup>146</sup> *Id.* at 6.

<sup>147</sup> App. Ex. 1 at 161.



As the record reflects, avian collision levels with wind turbines vary based on the species, season, and region. Studies of the Project area revealed a relatively low use of the site by raptors, such as the red-tailed hawk. Even where concentrated hawk migration does occur, evidence suggests that risk to migrating raptors is not great and not likely biologically significant. The low impacts expected by the Project on the raptor species are not likely to affect local or regional populations. Similarly, collision risk to resident, migrant, and wintering waterfowl, waterbirds, and shorebirds, in the Project area is likely to be minimal, even during migration. Waterfowl, waterbirds, and Canada geese mortality is rare or absent at wind turbines, even though they are often the most abundant group of birds present at most projects.<sup>148</sup> Based on the survey results, the Project area does not appear to be of great importance to special status or migratory raptors and not located in a concentrated migration corridor.<sup>149</sup> BSBO/Residents witness Shieldcastle acknowledged the Project area is not located in an Important Bird Area.<sup>150</sup> While much of BSBO/Residents Brief discusses the importance of Magee Marsh to migrating birds, Magee Marsh is approximately 30 miles from the Project area and the habitat for birds in the Project area differs considerably from Magee Marsh.<sup>151</sup>

However, regardless of these well-documented findings, as with other portions of their brief, BSBO/Residents make broad statements regarding a fear of possible bird mortality that may be intended to garner empathy for their position, none of which, however, is supported by evidence on the record. For example, they state that the protection of migratory birds is “vital to the natural environment and human creation,” opining that siting the turbines in the migratory path of birds is irresponsible and violates R.C. Sections 4906.10(A)(3) and (6).<sup>152</sup> Under BSBO/Residents’ theory, any airspace used by birds in their migration from “the tropics of South American to the north woods of Canada” must be protected; thus, not only should turbines not be constructed in the Project area, they, along with buildings and other tall structures (which are more likely to kill birds) should not be constructed anywhere in North America.<sup>153</sup> The record clearly supports the location of the turbines being in the area that has been chosen by Firelands, because the species presence and levels of use are similar to other wind-energy projects in the Midwest, where

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<sup>148</sup> App. Ex. 1 at 157-158.

<sup>149</sup> *Id.* at Ex. S; App. Ex. 32 at 9-11; App. Ex. 33 at 12-15, CF-2, CF-4.

<sup>150</sup> Tr. Vol. VII at 927.

<sup>151</sup> *Id.* at 924; 933.

<sup>152</sup> BSBO/Residents Br. at 46.

<sup>153</sup> *Id.* at 45-46.

mortality has been low relative to population sizes. While BSBO/Residents site concerns of this conclusion based on their belief that passerines were not studied properly,<sup>154</sup> their comments are unfounded. This conclusion was based on on-site study results, and the results of post-construction monitoring studies at over 200 wind-energy facilities in the U.S. that show passerine mortality is low relative to other sources of bird mortality.<sup>155</sup> Not only that, passerine mortality rates at Midwest wind projects is a remarkably constant number. In fact, BSBO/Residents' witness, Mr. Shieldcastle admitted that bird mortality at wind projects was a lower source of mortality.<sup>156</sup> The USFWS Guidelines specifically state, "For most of their flight, songbirds and other nocturnal migrants are above the reach of wind turbines, but they pass through the altitudinal range of wind turbines during ascents and descents and may also fly closer to the ground during inclement weather."<sup>157</sup> BSBO/Residents witness Mr. Shieldcastle acknowledged this statement is consistent with his understanding of songbird migration.<sup>158</sup> For this reason, the average number of passerine fatalities due to wind energy is two fatalities/MW/year.<sup>159</sup> BSBO/Residents argue that risk is higher from the Project to nocturnally migrating songbirds is when they are ascending (taking off) or descending (landing) or during periods of inclement weather. Ascent and descent within the Project area may occur, as it does at every other wind-energy project in North America. Relative to areas around the shoreline of Lake Erie, the Project area provides lower quality stopover habitat. Mr. Shieldcastle went so far as to state, "There has been some work done on how birds move around looking for favorable habitat and stopover. But most of the birds generally will press on because they are getting close enough to the Lake, they are already starting to drop down and they can see, as far as stopover, better habitat ahead of them."<sup>160</sup>

BSBO/Residents insist that the Board cannot determine the nature of the probable environmental impact of the facility under R.C. Section 4906.10(A)(2) without first conducting a nighttime radar monitoring study to evaluate the possible threat to migrating birds, claiming that the Project area has been designated an important bird area<sup>161</sup> (which is false). The Project area has not been designated as an important bird area – BSBO/Residents are fabricating this idea in

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<sup>154</sup> *Id.* at 49.

<sup>155</sup> App. Ex. 32 at 21.

<sup>156</sup> Tr. Vol VII at 955.

<sup>157</sup> App. Ex. 48 at 30.

<sup>158</sup> Tr. Vol. VII at 950.

<sup>159</sup> *Id.* at 955.

<sup>160</sup> *Id.* at 1010.

<sup>161</sup> BSBO/Residents Br. at 52.

order to further their agenda. BSBO/Resident witness Mr. Shieldcastle acknowledged no such designation is associated with the Project area.<sup>162</sup> As the record reflects, a radar survey was not conducted because the Project lacks features that would be expected to concentrate bird migration, i.e., the Project is not located within an area identified by ODNR as having high enough concern to merit radar studies. In fact, both ODNR and USFWS visited the Project site and determined the forested riparian areas present were not of high enough quality to merit a radar study. Thus, USFWS and ODNR did not recommend that a radar study be conducted.<sup>163</sup> Indeed, ODNR classified the Project as requiring a moderate level of survey effort and radar studies are not required for this classification.<sup>164</sup>

BSBO/Residents contention that radar studies are necessary in order for the Board to determine the probable environmental impact are belied by their own witness. Mr. Shieldcastle testified that radar studies of nocturnally migrating songbirds are a manner of assessing risk.<sup>165</sup> USFWS states, “While an active area of research, the use of radar for determining passage rates, flight heights, and flight direction of nocturnally migrating animals has yet to be shown as a good indicator of collision risk.”<sup>166</sup> When questioned whether he was aware of studies that show a correlation between pre-construction passage rates and post-construction mortality, Mr. Shieldcastle admitted he was aware of attempts to show a correlation but “the correlations appear to be weak.”<sup>167</sup> Put more simply, if pre-construction radar surveys of nocturnally migrating songbirds bear no correlation to post-construction fatalities then BSBO/Residents’ contention that radar studies are necessary is nothing more than a red herring.

BSBO/Residents inaccurately attribute migratory concerns to the Project based on their likening the Project to one located on the shores of Lake Erie.<sup>168</sup> However, their concern in this regard is unwarranted, as this Project will not be located on the lake shore. It is notable, however, that there are currently 11 projects that are closer to the shore of Lake Erie than this Project and where bald eagle population densities are highest.<sup>169</sup> While BSBO/Residents attempt to liken the Project to one on the lake shore, even their own witness admits that the Project is 15-20 miles from

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<sup>162</sup> Tr. Vol. VII at 927.

<sup>163</sup> App. Ex. 32 at 21.

<sup>164</sup> Tr. Vol. VII at 943.

<sup>165</sup> *Id.* at 952.

<sup>166</sup> App. Ex. 48 at 30.

<sup>167</sup> Tr. Vol. VII at 953-54.

<sup>168</sup> BSBO/Residents Br. at 45-46.

<sup>169</sup> App. Ex. 33 at 20; Tr. Vol. II at 298.

Lake Erie, which is where migratory birds are most likely to stop over on their route to the northern shores – not in the Project area.<sup>170</sup>

BSBO/Residents once again insinuate, with no record support of evidence to base the accusation on, that the surveys conducted by the Applicant in accordance with the ODNR Protocols and USFWS Guidelines were designed to avoid detections. The truth, as supported on the record, is that all of the survey methods for birds were based on survey guidelines and recommendations from both the ODNR and USFWS. In fact, approximately 2,000 hours over multiple years of survey effort for birds was included in the Applicant's application;<sup>171</sup> far more data and studies than has been submitted for other applications before the Board, all of which have been approved.<sup>172</sup> As shown on the record, both USFWS and ODNR reviewed the study protocols and results of all the bird studies completed for the Project and determined that they were adequate; thus, verifying that the studies would enable the Board to determine the probable impact of the Project area on birds under R.C. Section 4906.10(A)(2). The total amount of survey effort for the Project exceeded the ODNR recommendations for bird surveys at wind-energy projects.<sup>173</sup>

BSBO/Residents set forth a number of unsubstantiated theories in an attempt to discredit the numerous bird studies conducted in the Project area. BSBO/Residents accuse the Applicant of skewing the results of the studies and manipulating the mathematical statistics regarding the birds' elevation, the timing and hours of the observations, and averaging the statistics – these unfounded allegations are false.<sup>174</sup> The truth is none of those theories are supported by record evidence – they are merely conjecture in a failed attempt to poke holes in the studies conducted in the Project area and hope that no one will notice there is no record support. For example, BSBO/Residents hypothesize that the Applicant's studies were flawed because their lay person count of the number of swans in the Project area was greater than the number found in the studies conducted by the Applicant's experts.<sup>175</sup> However, BSBO/Residents incorrectly interpreted the number of observations recorded in the Applicant's study as *an estimate of population*, by stating

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<sup>170</sup> *Id.* at 923, 961.

<sup>171</sup> App. Ex. 1 at 121, Exs. R- T, V-X; App. Ex. 32 at 4-17.

<sup>172</sup> *In re Application of Hog Creek Wind Farm, LLC*, Case No. 09-277-EL-BGN; *In re Application of Paulding Wind Farm, LLC*, Case No. 09-980-EL-BGN; *In re Application of Blue Creek Wind Farm, LLC*, Case No. 09-1066-EL-BGN; *In re Application of Paulding Wind Farm II, LLC*, Case No. 10-369-EL-BGN; *In re Application of Hog Creek Wind Farm, LLC*, Case No. 10-654-EL-BGN; *In re Application of Northwest Ohio Wind Energy, LLC*, Case No. 13-197-EL-BGN; *In re Application of Paulding Wind Farm IV, LLC*, Case No. 18-91-EL-BGN.

<sup>173</sup> App. Ex. 32 at 21.

<sup>174</sup> BSBO/Residents Br. at 56-57.

<sup>175</sup> *Id.* at 55.

the raw number of birds observed was lower than the number recorded by non-expert residents. Contrary to their erroneous interpretation, the Applicant's experts completed standardized surveys that included placing survey locations throughout the Project, recording the amount surveyed, and calculating rates of use - *not a population estimate*. It is undisputed on the record that the protocol used by the Applicant is standard practice for wildlife surveys. Conversely, BSBO/Residents non-expert survey efforts included visiting areas known to be highly used by swans, recording observations, but not reporting the level of survey effort or use. However, as supported on the record and by the ODNR Protocols and USFWS Guidelines, the only way to correctly compare survey results would be to report survey locations, survey efforts, and compare rates of use, not raw numbers of observations. Regardless, existing studies at over 200 wind-energy facilities clearly show that waterfowl mortality is very low relative to their abundance. Studies from Wolfe Island, which are relied on by BSBO/Residents as being representative of potential mortality at the Emerson Creek Wind Facility, where thousands of tundra swans occur and where turbines are located close to shoreline, reported zero tundra swan mortalities despite several years of monitoring.<sup>176</sup>

Bird mortality occurs at all tall structures. Peer reviewed studies,<sup>177</sup> and the USFWS<sup>178</sup> clearly show the level of mortality occurring at wind turbines is orders of magnitude lower than the number of birds that collide with buildings, radio and cellular towers, and other tall structures. Cats kill more birds than all other sources of bird mortality.<sup>179</sup> In fact, BSBO/Residents' own witness admitted on cross that habitat loss is a major cause of bird population declines.<sup>180</sup>

**3. The eagle surveys conducted by the Applicant enable the Board to determine the probable environmental impact and ensure that the facility represent the minimum environmental impact.**

Interestingly, BSBO/Firelands first contention regarding the eagle surveys is that they are outdated. However, it is undisputed in the record that the most recent eagle surveys conducted by trained experts following ODNR Protocols and USFWS Guidelines were conducted in 2020. It is true that the Applicant has conducted numerous eagle surveys over the course of many years of

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<sup>176</sup> App. Ex. 1 at 157-158.

<sup>177</sup> App. Ex. 32 at 23,  
[http://www.audubon.org/sites/default/files/documents/loss\\_et\\_al\\_bird-building\\_collisions\\_condor\\_2014.pdf](http://www.audubon.org/sites/default/files/documents/loss_et_al_bird-building_collisions_condor_2014.pdf);  
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0034025>

<sup>178</sup> App. Ex. 32 at Att. REG-2.

<sup>179</sup> *Id.*

<sup>180</sup> Tr. Vol. VII at 956-957.

studying the Project area. In fact, the Applicant went above and beyond what was required and completed 7 years of surveys – well beyond what is needed to inform risk.<sup>181</sup> All of the studies combined with the latest studies in the last six months reveal a robust time series of information. For example, the eagle nest surveys demonstrated the presence of 25 bald eagle nest structures within a 10-mile radius. The studies over time also demonstrated that use of the nest structures was not continuous – some were used, then not used, then used again. Raptors will maintain multiple nests in each of their territory so wildlife experts anticipate finding empty nests.<sup>182</sup> As shown in the record, this is typical of eagle populations.<sup>183</sup> However, this is a pattern that one would not see if only studies from the most recent 1 to 2 years were relied on. The multitude of data used by the Applicant is useful for qualitative purposes because it shows trends and population, and it also is “indicative of how stable the use patterns you observe more recently are and also what some of the habitat drivers of use patterns might be.”<sup>184</sup>

A number of inaccurate assertions are made by BSBO/Residents against the eagle activity surveys, including BSBO/Residents misunderstanding as to the purpose of the surveys. BSBO/Residents believe the surveys are to find out whether the eagles are likely to fly in areas proposed for wind turbine sites.<sup>185</sup> However, to the contrary, the surveys are designed to identify eagle use rates for populating the USFWS collision risk model and to identify important eagle use areas. An important eagle use area is not what BSBO/Residents’ witness Mr. Shieldcastle would have you believe – he believes it is everywhere an eagle flies or has undertaken an activity. By Mr. Shieldcastle’s definition, every square inch of Ohio is an important eagle use area – his definition is not only untenable, but it does not represent the intent of the USFWS Eagle Conservation Plan Guidance (“ECPG”) for the surveys. Rather, the surveys conducted by the Applicant did identify areas of concentrated, repeated use – and those areas are avoided or minimization measures have been undertaken within them per ECPG. The remainder of the complaints by BSBO/Residents centered on the footprint covered by the surveys, the manner in which the surveys were performed, the duration of the surveys and the study period, and the location of the surveys. None of these complaints are valid and are based on misinformation

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<sup>181</sup> App. Ex. 33 at Att. CF-2.

<sup>182</sup> Tr. Vol. II at 145.

<sup>183</sup> App. Ex. 1 at Exs. R, S, U.

<sup>184</sup> Tr. Vol. II at 23.

<sup>185</sup> BSBO/Residents Br. at 59.

regarding the agency protocols and guidelines for the eagle surveys. For example, the surveys are, in fact, designed to provide a representative sample of eagle use throughout the spatial extent of the Project, as recommended by the ECPG. In combination, the numerous surveys conducted sample the Project footprint in compliance with the ECPG. While the methods of surveys at the Project area may have varied over the years, that was attributed to the variation in recommendations from the agencies and the differences in the types and goals of each survey. However, the Applicant notes that the last two years of eagle use surveys were the same consistent method as recommended by USFWS.<sup>186</sup>

Further evidence that shows inaccuracy of BSBO/Residents allegation of flaws in the eagle surveys is their assertion that none of the eagle activity surveys conducted were in the entire footprint of the Project – in truth, the surveys conducted by the Applicant exceeded the Project footprint.<sup>187</sup> In addition, the numbers cited in their brief regarding the eagle surveys reveals that BSBO/Residents are comparing different types of surveys with different purposes – such comparisons are neither accurate nor useful. For example, they criticize the eagle nest monitoring surveys, which document the number of minutes the eagles are around the nests, stating that documenting when the eagle stays close to the nest leads to the inaccurate conclusion that most eagle activity was concentrated within a half mile of the nests. The survey methods used to assess how eagles use areas near the nest followed ODNR protocols, and neither the USFWS nor ODNR recommended additional surveys after reviewing the results of Applicant’s surveys. With no evidence on the record, BSBO/Residents go so far as to accuse the Firelands of utilizing “less robust protocol” saying that Firelands “likely concluded nests were inactive and then failed to monitor them after they became active.”<sup>188</sup> In actuality, Firelands’ survey protocol was robust, as it followed the USFWS ECPG and the surveyors returned to the nests to confirm the status of the nest at least 30 days after the nest surveys if the nests were initially documented as unoccupied.<sup>189</sup>

BSBO/Residents attempt to inflate the reality of eagle collisions. However, with regard to the impact on bald eagles as a result of the Project, it is noteworthy that, to date, there has been only one bald eagle fatality reported in the news in Ohio.<sup>190</sup> For context, Ohio has 39 operating

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<sup>186</sup> App. Ex. 1, Exs. R, S.

<sup>187</sup> *Id.* at Ex. S1-S2; BSBO/Resident Br. at 59.

<sup>188</sup> BSBO/Residents Br. at 59.

<sup>189</sup> App. Ex. 1 at Exs R, S; App. Ex. 33.

<sup>190</sup> <https://www.toledoblade.com/local/environment/2020/05/01/Bald-eagle-killed-by-wind-turbine-at-Wood-County-site/stories/20200503028>

wind projects, with a total of 419 turbines producing 864 MWs of electricity. The total number of projects in the state include 11 projects that are closer to the shore of Lake Erie than this Project and where bald eagle population densities are highest.<sup>191</sup>

BSBO/Residents, on the other hand, attempt to elevate activities conducted by local residents who are not trained in how to conduct an eagle survey and did not follow the requirements set forth in the ODNR Protocols or the USFWS Guidelines in their explorations.<sup>192</sup> Ms. Beck's testimony attempts to quantify the total number of eagle sightings by various individuals. The first issue with this approach is that the sightings were not confirmed by trained wildlife experts. Second, unlike Applicant's surveys, there was no limitation on the distance at which a "sighting" could be counted.<sup>193</sup> Last, again unlike Applicant's surveys, there is no indication of the effort put forth related to each sighting. For example, residents may have counted sightings that occurred 1,000 meters away and may have spent 100 hours for each sighting. Naturally, expending more effort will result in more sightings. It is notable as well that the residents' sightings occurred during an extended time period between December 2019 and June 2020.<sup>194</sup>

The eagle nest surveys conducted by the local residents were not performed in accordance with ODNR or FWS guidelines.<sup>195</sup> BSBO/Residents argue that Applicant did not survey and record all occupied/unoccupied eagle nests in the Project area. BSBO/Residents' brief focuses on all eagle nests within 2.5 miles of the Project boundary, contending that nests at this distance are at risk of impact from the Project; however, no evidentiary basis was provided to support the 2.5 mile distance. Conversely, the relevant wildlife agencies have provided context that the 1/2-mean internest distance for the Project is the relevant metric for evaluating potential impacts (ECPG) and that even searching for eagle nests is not advised more than 2.0 miles from the Project Boundary. In the BSBO/Residents brief, a table is presented that compares eagle nest locations reported by Ms. Beck to those reported by Applicant witness Dr. Farmer. Table 1 below replicates that comparison and extends it with accurate measurements made in a GIS system by a professional GIS analyst using the most current turbine layout for the Project. Table 1 demonstrates that there are turbines within the ½ mean internest distance of only two nests — Bellevue Reservoir 5

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<sup>191</sup> App. Ex. 33 at 20; Tr. Vol. II at 298.

<sup>192</sup> *Id.* at 885, 898-899.

<sup>193</sup> *Id.* at 888.

<sup>194</sup> *Id.* at 887-88.

<sup>195</sup> *Id.* at 886.



(discovered by Applicant in 2020) and Daniels Road North (discussed below). In Stipulation Condition 31, Applicant committed to a process to ensure that appropriate eagle conservation measures are developed with respect to turbines.

Focusing on the nest Ms. Beck identified as “Daniels Road North,” BSBO/Residents do not dispute that Applicant surveyed this nest in 2018 and 2020 and determined it was a red-tailed hawk nest.<sup>196</sup> Ms. Beck testified that she had a picture of an eagle on this nest.<sup>197</sup> Applicant Exhibit 86 was identified by Ms. Beck as the picture of an eagle on the nest she identifies as “Daniels Road North.”<sup>198</sup> No eagle is evident in the picture and Ms. Beck testified, “You just can’t see it because of the backlight.”<sup>199</sup> Regardless, even assuming this is an eagle nest, four turbines are sited within the ½ mean internest distance as depicted in Table 1. Dr. Farmer testified the presence of these turbines may trigger additional consideration during the Eagle Conservation Plan (“ECP”)/Eagle Take Permit (“ETP”) process with USFWS; however, there is no prohibition of turbines within this distance.<sup>200</sup>

In addition to “Daniels Road North” nest, BSBO/Residents contend Applicant failed to identify nests they identify as Potter Road, Patten Tract, and Huber Road, although Ms. Beck acknowledged on cross-examination that Applicant previously identified the Patten Tract nest.<sup>201</sup> Ms. Beck also acknowledged she did not see a bald eagle on the Potter Road nest.<sup>202</sup> Also, as shown in Table 1, there are no turbines proposed within the ½ internest mean distance of this nest. Despite BSBO/Residents’ contention that Applicant failed to identify multiple eagle nests in the Project area, the record evidence establishes the nest they identify as “Huber Road” is the only occupied nest they are really contending Applicant did not locate and survey. This nest is located 1.48 miles outside the Project boundary, and therefore beyond the limit of the area surveyed by Applicant in 2020 following a protocol based on the ½ mean internest distance provided by USFWS (1.48 miles). Notably, an unknown, non-eagle, raptor nest was recorded in the vicinity of the Huber Road nest during ground-based surveys by WEST in 2018.<sup>203</sup> Again, there are no turbines proposed within the ½ internest distance of this nest. Given BSBO/Residents attempted

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<sup>196</sup> *Id.* at 890-91.

<sup>197</sup> *Id.* at 890-91.

<sup>198</sup> *Id.* at 897.

<sup>199</sup> *Id.* at 898.

<sup>200</sup> App. Ex. 33 at 15-16.

<sup>201</sup> Tr. Vol. VII at 891.

<sup>202</sup> *Id.* at 893-94.

<sup>203</sup> App. Ex. R-1.

to identify nests with untrained individuals from as far away as a quarter mile, their conclusions as to what constituted an eagle nest as opposed to the nest of another raptor are more than suspect.<sup>204</sup>

In addition to the safeguards and requirements in the Stipulation, the Applicant has incorporated the numerous safeguards and commitments in to the siting and operation of the Project, including that the turbines will be sited to avoid known bald eagle nests and known areas of concentrated eagle use.<sup>205</sup>

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<sup>204</sup> Tr. Vol. VII at 905-06.

<sup>205</sup> App. Ex. 1 at 161.

**Table 1. Comparison of nest records reported by Beck and the Applicant**

Beck ID (Resident's distance to project)	Farmer ID (Applicant's distance to project)	Distance to nearest turbine (turbine ID)	No. Turbines within ½ - mean internest distance <sup>1</sup>
Billings Road (1 mi)	11 (0.96 mi)	1.34 mi (T1)	0
Route 269 (1 mi)	15 (0.91 mi)	2.12 mi (T6)	0
Ruffing (2 mi)	19 (1.97 mi)	2.31 mi (T43)	0
Pontiac Section Line (0.859 mi)	20 (0.63 mi)	1.26 mi (T45)	0
Daniels Road CSX (Inside Project area)	23 (inside Project area)	1.25 mi (T69)	0
Seneca-Huron Line Road (1.42 mi)	24 (1.49 mi)	4.50 mi (T70)	0
Bellevue Reservoir 5 (0.119 mi)	25 (0.10 mi)	0.79 mi (T41)	3
Patten Tract Road (0.730 mi)	12 (0.73 mi)	2.44 mi (T3)	0
Potter Road (0.946 mi)	Uncertain (0.87 mi)	1.70 mi (T11)	0
Huber Road (1.48 mi)	not previously reported (1.48) <sup>2</sup>	2.05 mi (T16)	0
Daniels Road North (on boundary)	RTHA <sup>3</sup> (on boundary)	0.19 mi (T69)	4

<sup>1</sup> 1/2-mean internest distance for the project is 1.18 mi

<sup>2</sup> This nest was outside the 2020 eagle nest search area. In 2018, WEST reported an unoccupied, non-eagle raptor nest slightly north of this location.

<sup>3</sup> Documented as Red-tailed hawk nest by WEST field biologist in early March 2020.

### III. CONCLUSION

As thoroughly set forth in the Applicant's brief and supported herein, all of the criteria in R.C. Section 4906.10 have been addressed by the Stipulating Parties in the Stipulation. In addition, all 3 prongs of the test utilized by the Board in its consideration of a stipulation have been met. Therefore, the Board should adopt the Stipulation without modification and issue a Certificate to Firelands.

Respectfully submitted,

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## CERTIFICATE OF SERVICE

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to this case. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons listed below via electronic mail this 4<sup>th</sup> day of December, 2020.

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4811-3742-7411 v7 [59714-18]

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Summary: Reply Brief of Firelands Wind, LLC electronically filed by Christine M.T. Pirik on behalf of Firelands Wind, LLC