BEFORE THE STATE OF NEW YORK BOARD ON ELECTRIC GENERATION SITING AND THE ENVIRONMENT

In the Matter of

Bluestone Wind LLC

Case 16-F-0559

JUNE 7, 2019

Redacted Prepared Testimony of:

Jeremy Rosenthal Utility Analyst (Environment) Electric Gas and Water State of New York

State of New York Department of Public Service Three Empire State Plaza Albany, New York 12223-1350

1	Q.	Please state your name and business address.
2	Α.	Jeremy Rosenthal, Three Empire State Plaza,
3		Albany, New York 12223.
4	Q.	By whom are you employed and in what capacity?
5	Α.	I am employed by the Department of Public
6		Service (Department) as a Utility Analyst
7		(Environment) 3, in the Office of Electric, Gas
8		and Water, Environmental Certification and
9		Compliance Section.
10	Q.	Mr. Rosenthal, please state your educational
11		background and professional experience.
12	Α.	I received a Master of Public Administration
13		from the State University New York at Albany;
14		Rockefeller College of Public Affairs and Policy
15		in May 2005 with concentrations in Government
16		Fiscal Management and Environmental Management
17		and Policy. My undergraduate degree is a
18		Bachelor of Arts in Environmental Sciences from
19		the State University of New York, Plattsburgh
20		received May 1993. Before joining the
21		Department, I worked for four years as an
22		Environmental Analyst at the New York State
23		Department of Environmental Conservation. In

1		2009, I joined the Department's Office of Energy
2		Efficiency and the Environment and was assigned
3		to work on the Energy Efficiency Portfolio
4		Standard, Environmental Disclosure Program, and
5		related issues. In 2016, I transferred to my
б		current position in the Office of Electric, Gas
7		and Water, Environmental Certification and
8		Compliance section. My primary responsibilities
9		include evaluating the environmental impacts
10		associated with siting, construction and
11		operation of gas and electric transmission lines
12		under Article VII and electric generation
13		facilities under Article 10 of the Public
14		Service Law (PSL).
15	Q.	Have you testified before the New York State
16		Public Service Commission (Commission) or the
17		Board on Electric Generation Siting and the
18		Environment (Siting Board)?
19	A.	I am currently involved in the review of over a
20		dozen PSL Article 10 cases and affiliated PSL
21		Article VII cases. For example, I testified
22		regarding Exhibit 22 - Terrestrial Ecology and
23		Wetlands - in the Cassadaga Wind Project

1		(Cassadaga) Case 14-F-0490, the Number Three
2		Wind, LLC Case 16-F-0328, and the Eight Point
3		Wind, LLC Case 16-F-0062 (Article 10), in
4		addition to the Case 18-T-0202 (Article VII).
5	Q.	Please describe your role in this case and the
б		purpose of your testimony.
7	Α.	I am responsible for reviewing Bluestone Wind
8		LLC's (the Applicant) Application and evaluating
9		the probable environmental impacts from the
10		construction and operation of the proposed major
11		electric generation wind project (the Project)
12		to terrestrial ecology. My testimony will focus
13		on the potential impacts of the Project on avian
14		and bat species, including an evaluation of
15		proposed actions to minimize and mitigate
16		impacts to those species.
17	Q.	In your testimony, will you refer to, or
18		otherwise rely upon, any information produced
19		during the discovery phase of this proceeding?
20	Α.	No.
21	Q.	Are you sponsoring any exhibits to accompany
22		your testimony?

1	Α.	Yes. I will refer to several source documents
2		as referenced in Exhibit_(JR-1) which is,
3		generally, journal articles related to the
4		impacts of wind energy facilities to bats, and
5		the Vermont wind facility siting guidelines;
6		Exhibit_(JR-2), which is materials submitted by
7		the Delaware-Otsego Audubon Society (DOAS);
8		Exhibit_(JR-3), which is the RoxWind Incidental
9		Take Plan; and, Exhibit_(JR-4), which is a
10		regression analysis of curtailment.
11	Q.	Do you have concerns with this Project as it
12		relates to impacts on bats and eagles?
13	A.	Yes. I will address eagles first. The Project
14		has the potential to impact Bald Eagles
15		(Haliaeetus leucocephalus) and Golden Eagles
16		(Aquila chrysaetos).
17	Q.	Have these species been observed at the Project
18		site?
19	A.	Yes. Both species were observed in the Project
20		area displaying a wide range of behaviors during
21		site surveys.
22	Q.	What is the basis for your statement that both
23		species were observed in the Project area?

1	Α.	The basis for this statement is avian risk
2		assessment filed by the applicant and the
3		surveys conducted by DOAS contained in Exhibit_
4		(JR 2).
5	Q.	, Does this Project pose a greater risk to
6		eagles than other projects located elsewhere in
7		New York State?
8	Α.	Yes. As indicated in the DOAS April 2019 raptor
9		survey and the assessment of the seasonal status
10		of golden eagles, the Project area is used by
11		eagles year-round and has a high concentration
12		of eagle use compared to other parts of the
13		State. The report goes on to indicate that The
14		Project's proposed location is sited in an eagle
15		migration corridor and hosts Golden Eagles as
16		winter residents and Bald Eagles in both the
17		summer and winter time. Exhibit_(JR-2, p.
18		82,126.)
19	Q.	Does the Project area contain any geographic
20		features that are noteworthy in terms of use of
21		the landscape by eagles?
22	Α.	Yes. On the east side of the Project is a ridge
23		with a string of proposed turbines that runs

1		north-east from proposed turbine 25 to turbine
2		29. The DOAS 2019 raptor survey observed
3		regular use of this area by eagles and the DOAS
4		report notes "many eagles using lift along the
5		ridge and many migrants followed a direct path
6		along that ridge." Exhibit_(JR-2, p. 126).
7	Q.	Please briefly describe the DOAS report's
8		findings.
9	Α.	The DOAS report provides additional survey
10		information that conflicts with information
11		provided by the Applicant with respect to eagle
12		numbers and use patterns, which if valid,
13		strongly calls into question the protectiveness
14		of the Project design regarding eagles.
15	Q.	What additional information did the DOAS report
16		indicate?
17	Α.	The DOAS report provided information showing the
18		Project area is utilized by a winter resident
19		Golden Eagle population and survey results
20		further identified high eagle use of the eastern
21		ridge. According to the DOAS report "[t]he
22		March 2018 surveys in Sanford found the highest
23		number of individual non-migrant Golden Eagles



Why is that significant? 1 Ο. 2 The presence of wintering eagles at the Project Α. 3 increases risk because it increases the amount 4 of time that eagles are on the landscape. The assessment of collision risk in the NCBP is 5 predicated on the idea that Golden Eagles <BEGIN б 7 CONFIDENTIAL INFORMATION>" 8 9 10 11 "<END CONFIDENTIAL INFORMATION> The 12 discovery of a resident Golden Eagle population 13 by the DOAS report calls into question the 14 Applicant's assertions, and the associated risks 15 to Golden Eagles from the Project. 16 Ο. What additional information does the DOAS late winter and spring 2019 survey provide? 17 18 The DOAS late winter and spring 2019 survey Α.

identifies significant eagle use in proximity to
proposed turbines 25, 26, and 29, and the survey
identifies that the area is used by resident
Bald and Golden Eagles and migrating eagles of
both species. Exhibit (JR-2, p. 126).

1	Q.	Did the DOAS report provide any other
2		information related to the risk posed by
3		individual turbines to eagles?
4	Α.	Yes. In addition to surveys, the DOAS report
5		provides an assessment of risk of individual
6		turbines to Golden Eagles. (Exhibit(JR-2), pp.
7		45-61). In this report, risk to migrating
8		Golden Eagles from individual turbines is
9		predicted. The NCBP provided by the Applicant
10		does not specify risk from individual turbines,
11		but rather proposes take numbers for eagles in
12		general form the Project.
13	Q.	Does the report provide any mitigation measures?
14	A.	Yes. The report makes suggestions of options
15		for micro-sitting individual turbines to reduce
16		Golden Eagle risk. The DOAS risk assessment
17		report predicted five turbines as higher risk to
18		migrating Golden Eagles on the eastern ridge.
19		The DOAS late winter and spring 2019 raptor
20		survey identified high levels of use near
21		proposed turbines 25, 26, and 29. This suggests
22		that the entire eastern ridge of the Project
23		site is potentially problematic.

1	Q.	Do areas of the Project other than the eastern
2		ridge pose a risk to eagles according to the
3		DOAS report?
4	A.	Yes, the DOAS assessment of risk to migrating
5		eagles by individual turbines identified
6		proposed turbines 23 and 13 as higher risk, but
7		surveys have not specifically looked at those
8		turbines and nearby turbine sites for eagle
9		activity.
10	Q.	Do you agree with the conclusions of the Avian
11		Risk Assessment provided with the Application?
12	A.	No. The Avian Risk Assessment provided with
13		the Application concludes <b><begin b="" confidential<=""></begin></b>
14		INFORMATION>"
15		
16		
17		" <end confidential="" information=""> This</end>
18		assessment is not supported by observations of
19		eagles on the landscape within the Project. In
20		short, it is at odds with the DOAS report.
21	Q.	Do you think additional eagle use surveys would
22		be beneficial and if so why?

1	Α.	Yes. The surveys performed to date do not
2		provide a complete picture of eagle use in
3		relation to proposed turbines. As illustrated
4		by the 2019 DOAS survey, when survey efforts
5		focused on turbine sites high eagle use was
6		found. Additional surveys could further inform
7		the record and facilitate more appropriate
8		turbine locations.
9	Q.	Did the Applicant propose Certificate Conditions
10		designed to protect the Bald and Golden Eagles?
11	Α.	Yes, the Applicant proposed Certificate
12		Conditions 68, which provides a framework to
13		avoid and minimize impacts to eagles.
14	Q.	Do you agree with the Applicant's stipulated
15		Certificate Conditions.
16	Α.	Not entirely, which is why DPS Staff did not
17		stipulate to this condition. My review of the
18		Applicant's proposed Certificate Conditions
19		leads me to make several suggested
20		modifications.
21	Q.	What are those modifications and why are you
22		recommending them?

1	Α.	Condition 68(a) calls for "The use of a single
2		bio-monitor to simultaneously monitor turbine
3		locations T25, T26 and T29 for a minimum of two
4		years after operations or the development of
5		automated avian detection and curtailment
6		technology systems covering turbine locations
7		T25, T26, and T29." The condition should
8		clarify the duration of time that the automated
9		system should remain operational. I recommend
10		the lifetime of the project after installation.
11	Q.	Do you have any comments regarding condition
12		68(b)
13	Α.	Yes. Applicant's proposed Condition 68(b)
14		requires that after the first two years of

15 operation the Certificate Holder will consult with the DPS and DEC Staff to discuss if ongoing 16 monitoring is needed or determine appropriate 17 18 changes based upon on-site data, updated 19 automated avian detection and curtailment technology, and current research in wind-eagle 20 21 interactions. I recommend this condition 22 include a mechanism to determine the outcome of 23 the consultation if parties are not in agreement

1		and a means of enforcement. In addition, I
2		recommend that at the end of the first year,
3		interim monitoring results be provided to DPS
4		and DEC Staff to inform and lay the foundation
5		for developing a discussion and building a
6		consensus at the two-year consultation between
7		agencies and the Certificate Holder.
8	Q.	Do you have any comments regarding the
9		Applicant's proposed Condition 68(c)?
10	A.	Yes. Condition 68(c) discuses actions to be
11		taken in the event of an eagle take. I
12		recommend identifying the mechanism that will be
13		employed to ensure that if a take were to occur
14		it is recognized.
15	Q	Do you have any other comments on the
16		Applicant's proposed Certificate Conditions?
17	Α.	Yes. I recommend adding DPS Staff to the list
18		of agencies consulted in developing a Post
19		Construction Avian and Monitoring and Adaptive
20		Management Plan as per proposed Certificate
21		Condition 70. All these recommendations will
22		lead to better monitoring and coordination.

1	Α.	Based on the foregoing, can you make a
2		recommendation to the Siting Board regarding the
3		Project design as it relates to impacts to Bald
4		and Golden Eagles?
5	Α.	Provided the Siting Board adopts the Applicant's
6		proposed Certificate Conditions with the
7		modifications I have discussed here in my
8		testimony, I submit that the Siting Board can
9		make the required findings with regard to impact
10		on eagles. However, if the Siting Board does
11		not adopt the proposed Certificate Conditions as
12		modified herein, then it should consider
13		alternative avoidance and minimization and/or
14		additional mitigation measures.
15	Q.	What types of avoidance and minimization and/or
16		additional mitigation measures are available?
17	Α.	The risks to eagles could be reduced through
18		eliminating some turbines, micro-siting other
19		turbines, and/or developing operational
20		controls.
21	Q.	What turbines would you recommend for
22		elimination?

1	Α.	The eastern ridge was identified as an area
2		within the Project site with elevated risk.
3		Proposed turbines 25, 26, and 29 have documented
4		high use and as such are particularly
5		problematic. In addition, proposed turbines 13,
6		22, 23, 27, 31, 32, and 40 are referred to by
7		the DOAS report for micro-siting to reduce risk.
8		These turbines could be candidates for micro-
9		siting. I would recommend such a review during
10		the compliance phase of this case should the
11		Siting Board approve the Project.
12	Q.	What is micro-siting?
13	Α.	Generally speaking, micro-siting is moving the
14		location of a turbine on the landscape such that
15		it poses a lower risk.
16	Q.	Are there limitations to micro-siting in the
17		compliance phase?
18	Α.	Yes. I am advised by counsel that the amount
19		that a turbine can be moved is limited under the
20		PSL Article 10 regulations before triggering a
21		revision versus a modification.

1	Q.	Has the Applicant eliminated any turbines from
2		the Project as originally proposed to
3		specifically avoid impacts to eagles?
4	Α.	The Applicant, in its most recent update, opted
5		to eliminate six turbines from the Project
6		including turbines 11, 16, 19, 22, 30 and 32.
7		Most of the turbines identified for elimination
8		are not turbines that are identified as high
9		risk to eagles.
10	Q.	In the event the Siting Board does not accept
11		the pertinent Certificate Conditions with your
12		recommended modifications, why are you proposing
13		avoidance and minimization?
14	A.	The USFWS issued a report in 2016 entitled "Bald
15		and Golden Eagles, population demographics and
16		estimation of sustainable take in the United
17		States, 2016." Exhibit_(JR-1). This report
18		includes calculations of the level of take Bald
19		and Golden Eagle population can incur and still
20		meet management goals that maintain stable or
21		growing populations. The report found that
22		Golden Eagles cannot incur any take levels
23		without offsetting the mortality rate. The

1		report further states on page vi, "currently,
2		the only offsetting by compensatory mitigation
3		measure the Service has enough information to
4		confidently apply in this manner is retrofitting
5		of power lines to reduce eagle electrocutions."
6		This is problematic because the DOAS report
7		makes a compelling argument that power pole
8		retrofitting is not effective for Golden Eagle
9		mitigation in New York State.
10	Q.	Why is that?
11	Α.	The DOAS report references Western states where
12		tree cover is not abundant and Eagles often rest
13		on power poles, and are electrocuted. Here in
14		the Northeast, there is abundant tree cover and,
15		therefore, there are far fewer electrocutions as
16		eagles land on trees not power poles. Exhibit
17		(JR-2, p.40-44). Review and Assessment of
18		Compensatory Mitigation Options for Golden Eagle
19		Take Permits in the Northeastern USA, Pages 34-
20		44).
21	Q.	Are there any other reasons why avoidance and

22 minimization is warranted?

1	Α.	For the Siting Board to substantively comply
2		with Part 182, I am advised by counsel that
3		mitigation needs to comply with net conservation
4		benefit standards which require a "successful
5		enhancement of the species" overall population
6		or contribution to the recovery of the species
7		within New York.
8	Q.	In the event the Siting Board does not adopt the
9		proposed Certificate Conditions as modified, are
10		you recommending any other eagle risk avoidance
11		and minimization measures?
12	Α.	Only the type of operational controls already
13		noted in proposed Certificate Condition 68 such
14		as bio-monitors and aviation detection and
15		curtailment technology.
16	Q.	Aside from eagles, are there other avian species
17		you have concerns about in the Project area?
18	Α.	Yes, I am concerned about the impacts to the
19		Northern Long Eared (NLEB) and migratory bats.
20	Q.	Could the proposed Project add to cumulative bat
21		mortality from wind facilities in New York
22		State?

1	Α.	Yes. Without adequate avoidance or minimization
2		measures the proposed wind turbine facilities
3		could contribute to bat mortality, particularly
4		migratory bat species.
5	Q.	Why are you concerned about impacts to migratory
6		bats in particular?
7	Α.	The majority of bat mortality at wind farms is
8		attributable to migratory bat species, which the
9		Applicant stated accounts for 75% of all bat
10		fatalities. Migratory bat species in New York
11		State include the eastern red bat [Lasiurus
12		borealis], the hoary bat [Lasiurus cinereus],
13		and the silver-haired bat [Lasionycteris
14		noctivagans]. Frick, W.F. et al, 2017,
15		forecasts that at the current level of bat
16		mortality impacts from wind turbines in North
17		America, in the absence of adequate minimization
18		measures, impacts could "drastically reduce
19		population size and increase the risk of
20		extinction" for migratory bats.
21	Q.	Should measures be taken at the proposed Project
22		site to minimize impacts to all bats?

1	Α.	Yes. Migratory bat species are considered
2		Species of Greatest Conservation Need in New
3		York. Since they are not listed as Threatened
4		or Endangered species, and thus are not
5		"protected" species, there is no regulatory
6		requirement that there be a NCBP for those bats.
7		This, however, does not mean that wind
8		facilities do not pose a risk to such species.
9		Therefore, operation of the proposed Project
10		should include a curtailment regime that
11		adequately minimizes impacts to all vulnerable
12		bat species including migratory bats.
13	Q.	What do you mean by a curtailment regime?
14	Α.	A curtailment regime is the management of wind
15		turbines such that the conditions under which
16		turbine blades are permitted to spin is
17		constrained. Cut-in refers to the lowest wind
18		speed at which turbine blades are permitted to
19		freely spin.
20	Q.	Does the Application propose a curtailment
21		regime with a cut-in speed?
22	Α.	Yes. The Applicant proposed a curtailment
23		regime with a cut-in speed of 5.0 meters-per-

1		second (m/s) July 1 through September 30 between
2		sunrise and sunset when temperatures are above
3		10 degrees Celsius (50 degrees Fahrenheit).
4	Q.	Did you stipulate to a proposed Certificate
5		Conditions on cut-in speed?
6	A.	Yes. Staff stipulated to a cut-in speed of 5.5,
7		but with adaptive management.
8	Q.	What is adaptive management?
9	A.	Adaptive management entails monitoring impacts
10		to bats from the Project over time and adjusting
11		operations accordingly.
12	Q.	If the Siting board does not accept the proposed
13		stipulated Certificate Condition with adaptive
14		management, what curtailment regime would you
15		recommend?
16	Α.	If the Siting Board does not adopt the proposed
17		stipulated Certificate Condition, then I would
18		recommend a curtailment regime with a cut-in
19		speed between 6.0 m/s and 6.9 m/s. Since bats
20		are nocturnal, and are particularly active
21		during warm summer nights, I would recommend a
22		curtailment regime of 6.0 m/s during July 1 to
23		October 1, to apply from one half hour before

1		sunset to one half hour after sunrise when
2		temperatures are greater than 50 degrees
3		Fahrenheit.
4	Q.	Why do you recommend this curtailment regime if
5		the Siting Board does not adopt the pertinent
6		proposed stipulated Certificate Conditions?
7	Α.	A cut-in speed of 6.0 m/s would afford greater
8		protection to more species of bats than the
9		Applicant's proposed 5.0 m/s cut-in speed. This
10		greater benefit is particularly important to
11		migratory bats that have the highest rates of
12		wind turbine caused mortality and fly at higher
13		wind speeds.
14	Q.	Why is higher curtailment more protective of
15		bats?
16	Α.	As illustrated in Exhibit(JR-4), there is a
17		strong trend indicating that increased cut-in
18		speeds correlate with decreased bat mortality.
19	Q.	What is the source data for Exhibit(JR-4)?
20	A.	The source of data for Exhibit(JR-4) is the
21		"American Wind Wildlife Institute White Paper,
22		Bats and Wind Energy: Impacts, Mitigation and
23		Tradeoffs," prepared by Taber D. Allison, PhD,

1		AWWI Director of Research, November 15, 2018
2		(White Paper).
3	Q.	Has this recommended cut-in speed been adopted
4		elsewhere?
5	A.	Yes. A 6.0 m/s cut-in speed aligns with
6		curtailment requirements in neighboring Vermont
7		as presented in Vermont Agency of Natural
8		Resources Fish and Wildlife Bat-Wind Guidelines,
9		September 2016. In the State of Maine, the
10		incidental take plan for the RoxWind project
11		dated October 2018 adopted a much more stringent
12		curtailment plan. The plan calls for
13		curtailment that "commences daily 1/2 hour
14		before dusk to ½ hour after dawn of the
15		following day, when ambient air temperatures are
16		at or above 32 degrees Fahrenheit. April 15-
17		July 15 Cut-in speed is increased from
18		manufactures designed speed to 6 meters per
19		second (m/s); July 16 - September 15, Cut-in
20		speed is increased to 6.6 m/s; and, September
21		16-September 30, cut-in speed returns to 6 m/s."
22	Q.	Does a 6.0 m/s cut-in speed achieve total
23		avoidance of bat mortality?

1	Α.	No. A 6.0 m/s curtailment regime will not
2		achieve what is considered complete or total
3		avoidance for migratory bats or the NLEB. While
4		a cut-in speed of 6.9 m/s could achieve total
5		avoidance for impacts on the NLEB, if the Siting
6		Board approves a lower cut-in speed, the
7		Applicant should also be required to provide a
8		NLEB NCBP as reflected in the proposed
9		stipulated Certificate Condition.
10	Q.	Have you considered the increased costs
11		associated with higher cut-in speeds?
12	A.	Yes. The project's net conservation benefit
13		plan provides values for production impacts
14		associated with a 6.9 m/s curtailment. Based on
15		the values provided in the NCBP, a curtailment
16		of 6.9 m/s would result in an annual energy
17		production reduction of <b><begin b="" confidential<=""></begin></b>
18		INFORMATION> .< END CONFIDENTIAL INFORMATION>
19		Values were not provided for other cut-in
20		speeds, but based on my experience evaluating
21		other projects, I would estimate that a 6.0 m/s
22		curtailment would be about half as much. The

1		magnitude of revenue impacts would roughly
2		parallel energy impacts.
3	Q.	Did the Siting Board establish a cut-in speed in
4		Case 14-F-0490 (Cassadaga)?
5	Α.	Yes. In Cassadaga the Siting Board ultimately
6		determined that a cut-in speed of 5.0 m/s was
7		appropriate with additional mitigation. This
8		decision, however, acknowledged potential
9		impacts to migratory bats with the rational that
10		"[w]ith respect to bat species that are not
11		listed as threatened or endangered, we are
12		required to find that impacts to those species
13		will be minimized or avoided to the maximum
14		extent practicable. A final Net Conservation
15		Benefit Plan designed for NLEB will also benefit
16		non-NLEB species."
17	Q.	What was Cassadaga Wind's NCBP?
18	Α.	Cassadaga Wind's NCBP ultimately resulted in
19		telemetry studies of the NLEB on Long Island,
20		and potentially to identification and protection
21		of the NLEB' roost tree habitats. The same as
22		is proposed here.
23	Q.	Did this assist in studying migratory tree bats?

1	Α.	Not entirely, the NLEB telemetry studies
2		identified the location of several roost trees
3		used by the NLEB on Long Island. The telemetry
4		work did not study migratory tree bats or their
5		use of habitat.
6	Q.	Should the curtailment regime remain constant
7		throughout the life of the Project?
8	A.	Not necessarily, changes in bat populations can
9		occur over time and new technologies to minimize
10		impacts may develop as well. Accordingly, I
11		recommend that a plan to evaluate bat
12		populations, minimization efforts, and potential
13		modifications to operations every five years
14		should be developed by the Applicant and be
15		submitted for Department Staff's acceptance as
16		proposed in Stipulated Certificate Condition 67
17		for the Siting Board's consideration.
18	Q.	Is it reasonable to expect the Applicant to
19		agree to an unknown future cost that could arise
20		from future curtailment regime modification?
21	A.	The concern of incurring unknown future costs is
22		legitimate. The cost uncertainty should be
23		addressed through language as proposed in

1		Stipulated Certificate Condition 67 for Siting
2		Board's consideration. Specifically, the
3		Project owner should not be subject to adopting
4		future curtailment or other mortality reduction
5		methods that are costlier than the curtailment
6		regime initially adopted. However, it should be
7		noted that in Cassadaga the Applicant's Brief on
8		Exceptions expressed a willingness to consider
9		an adaptive management approach to curtailment
10		based on post-construction monitoring.
11	Q.	Should a method for verifying compliance be part
12		of a curtailment regime?
13	Α.	Yes. A curtailment regime should include a
14		means to verify compliance. The Applicant
15		should provide a record of curtailment pursuant
16		to Stipulated Certificate Condition 67.
17	Q.	Are there any circumstances under which you
18		would agree to a curtailment regime with a cut
19		in speed less than 6.0 m/s?
20	A.	Yes. As indicated, the Stipulated Certificate
21		Condition 67 requires an evaluation of how
22		effective curtailment is working at the Project
23		every five years. This Condition will afford an

1 opportunity to employ adaptive management 2 including possible future modifications to the 3 existing curtailment or adoption of other bat 4 mortality minimization measures as technology 5 and knowledge improve over the lifetime of the 6 Project. Proposed Certificate Condition 67 7 protects the Project developer from unknown 8 costs while providing a possible means for 9 future improvements in the overall protection of 10 bats.

11 Are there any other minimization efforts that Ο. 12 you recommend for reducing mortality to bats? 13 Yes. A 2018 article by Christian C. Voight and Α. 14 others contained in Exhibit (JR-2) found that 15 migratory bats appear to be attracted to red 16 lights. They further speculate that aviation lighting on top of wind turbine nacelles may be 17 18 related to migratory bat mortality and that 19 lighting choices could lessen impacts. Accordingly, I recommend, subject to Federal 20 Aviation Administration (FAA) approval, that the 21 22 facility use an aircraft detection lighting 23 system to minimize the presence of red lights in

1		the night sky. The article also identifies
2		lighting closer to the infrared range as more
3		"bat friendly." If the FAA permits such
4		lighting options, I recommend their use.
5	Q.	Does this conclude your testimony?
6	Α.	Yes, at this time.