



Andrew J. Gibbons
612.335.1438 **DIRECT**
andrew.gibbons@stinson.com

September 20, 2018

VIA ELECTRONIC FILING

Mr. Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101-2147

Re: Flying Cow Wind, LLC's Exceptions to the Summary of Public Testimony, Findings of Fact, Conclusions of Law, and Recommendation of the Administrative Law Judge

In the Matter of the Applications of Flying Cow Wind, LLC for a Certificate of Need and Site Permit for the up to 152 MW Large Wind Energy Conversion System in Yellow Medicine County, Minnesota;

*MPUC Docket Nos. IP-6984/CN-17-676 and IP-6984/WS-17-749
OAH Docket No. 60-2500-35035*

Dear Mr. Wolf:

In accordance with Minn. R. 7829.2700, subp. 1 and the Honorable James E. LaFave's July 10, 2018 Order Granting Flying Cow Wind's Second Motion to Amend the Scheduling Order issued in the above-referenced proceedings, Flying Cow Wind, LLC ("Flying Cow Wind") respectfully submits the enclosed Exceptions to the Summary of Public Testimony, Findings of Fact, Conclusions of Law, and Recommendations of the Administrative Law Judge dated September 5, 2018.

Thank you for the opportunity to offer these Exceptions. Please feel free to contact me with any questions or concerns.

Sincerely,

Stinson Leonard Street LLP

A handwritten signature in blue ink, appearing to read "AJG", is written over a light blue horizontal line.

Andrew J. Gibbons

AJG:SLS

Enclosures

I. The ALJ's Recommendation to Remove Turbines is Unsupported by the Record.

The Report recommends the removal of turbines based on conclusions entirely related to visual impacts of the Project. These conclusions, i.e., that the visibility of the Project will negatively impact property values, recreation, tourism, and Lake Cochrane as a natural resource, are entirely unsupported in the record. The Report states that the “record demonstrates that several of the proposed turbines in the Project would dominate the landscape and create an immense visual impact for all viewers near Lake Cochrane.”² The Report goes on to state that the “visual impairment would damage Lake Cochrane’s recreational resources, arguably lower property values around the lake, and impact tourism, the benefits it provides to the community, and Lake Cochrane’s status as a unique natural resource.”³ These assertions and conclusions, however, are unsupported by and contradict the information provided in the record.

1. The Visual Simulations and LCIA Simulation Do Not Support the Report’s Conclusion of an Immense Visual Impact for All Viewers.

The conclusions around visual impacts rely entirely on the visual simulations of the Project. As support for the conclusion that turbines would “create an immense visual impact for all viewers near Lake Cochrane,” the Report cites to the visual simulations provided by Flying Cow Wind⁴ and a visual simulation attached as an exhibit to a filing of the LCIA.⁵ Conclusions about visual impacts of the Project, however, should not be based entirely on these visual simulations in the record.

First, Flying Cow Wind provided the Visual Simulations at the request of EERA and in response to the concerns of Lake Cochrane landowners.⁶ The Visual Simulations were presented as a representative sample of viewpoints in which turbines are expected to be visible to provide a sense of

² *Id.* at ¶ 314.

³ *Id.*

⁴ Ex. 214 (Flying Cow Wind Visual Simulations).

⁵ Lake Cochrane Improvement Association Ron Ruud Declaration (Aug. 6, 2018) (eDocket No. 20188-145561-02) (“Declaration”) at Exhibit A (“LCIA Simulation”).

⁶ Ex. 214 (Flying Cow Wind Visual Simulations).

scale from those specific viewpoints only.⁷ The Visual Simulations were not intended to represent all possible viewpoints, nor were they designed to be a comprehensive representation of possible visual impacts for the purposes of evaluating siting criteria. Because of the limited number of viewpoints represented in simulations in the record, and the numerous factors that impact Project visibility from different viewpoints, the record does not support the conclusion that the Project would “create an immense visual impact *for all viewers* near Lake Cochrane.”⁸

Second, visual simulations can be misleading if not used correctly. DNV KEMA Renewables, Inc. (“DNV GL”) prepared a memorandum at the request of Flying Cow Wind to provide additional detail regarding the process by which the locations for the visual simulations were selected, and to address the manipulation of the Visual Simulations (“DNV GL Memorandum”).⁹ In the DNV GL Memorandum, DNV GL explained how manipulating an image by cropping and zooming distorts the relative sizes of objects in the image.¹⁰ The same day that the DNV GL Memorandum was filed – the end of the Reply Comment Period following the Public Hearing – LCIA filed its reply comments, including the LCIA Simulation.¹¹ The LCIA Simulation, however, has limited probative value for the same reasons addressed in the DNV GL Memorandum.

Following the reliance of the Report on the LCIA Simulation as evidence of visual impacts, Flying Cow Wind requested that DNV GL prepare an analysis of the LCIA Simulation (the “Second DNV GL Memorandum”). That analysis is attached as **Exhibit A**. The Second DNV GL Memorandum demonstrates how the relative scale of objects can be distorted through manipulating images by cropping and zooming, or utilizing a larger focal length when a photograph is generated, as

⁷ Reply Comments of Flying Cow Wind at 5-6 (Aug. 6, 2018) (eDockets No. 20188-145568-01).

⁸ Report at ¶ 314 (emphasis added).

⁹ *Id.* at Exhibit B.

¹⁰ *Id.*

¹¹ Because the LCIA Simulation was filed on the last day of the Reply Comment Period, and because the LCIA Simulation was, by LCIA’s own admission, generated using a zoomed-in photograph similar to the manipulations addressed by the DNV GL Memorandum, Flying Cow Wind did not request leave to submit comments on the probative value of the LCIA Simulation.

was done for the LCIA Simulation.¹² The result of this zooming, whether on a camera or digitally after a photograph is taken, is that the resultant image is no longer representative of human sight at a location. Instead, the LCIA Simulation is only representative of the visibility of the Project from the location of the photo *through a 225 mm focal length lens of a camera*. Accordingly, while the record does support the conclusion that turbines will be visible from certain viewpoints at Lake Cochrane, the record does not support the conclusion that “several of the proposed turbines in the Project would *dominate the landscape*.”¹³

2. The Record Does not Support the Conclusion that Visual Impairment Will Damage Lake Cochrane Resources.

In addition to the conclusions about the visual impact of the turbines on Lake Cochrane, the record also does not support the conclusions about the resulting damage to Lake Cochrane. As noted above, the Report concludes that the visual impairment would damage recreational resources, “arguably lower property values,” and impact tourism.¹⁴ None of these conclusions are supported in the findings in the Report, and no information was submitted in the record to support these conclusions. Rather, the conclusions are based entirely on the concerns expressed in oral and written comments during the proceeding.¹⁵ That participants expressed concerns over these issues does not, however, establish that these impacts will or are likely to occur. Furthermore, expressing concern does not refute evidence to the contrary in the record. For example, the Report recognized the findings of two separate studies on the impacts of wind farms on property values submitted in the record, both of which concluded that property values are not negatively-impacted by wind farms.¹⁶ Indeed, seemingly acknowledging the lack of information in the record to support the conclusion that the Project will negatively impact property values, the findings in the Report that address negative property value

¹² Declaration at ¶ 7 (stating the photo was generated using a 225 mm focal length).

¹³ Report at ¶ 314 (emphasis added).

¹⁴ *Id.*

¹⁵ *Id.* at ¶¶ 101, 106, 116, 120-130, 132, 141, 148.

¹⁶ *Id.* at ¶¶ 167-168. Flying Cow Wind also submitted an additional study in its Reply Comments, updated the results of one of the studies cited. See Reply Comments of Flying Cow Wind at Exhibit C.

impacts do not actually assert that there will be a negative impact. First, the Report finds that “Lake Cochrane *may* be one of those ‘unique situations’” in which “specific, *individual* property values *may* be negatively impacted.”¹⁷ Additionally, the Report states that “visual impairment would. . . *arguably* lower property values around the lake.”¹⁸ These are not findings of fact, but pure conjecture based solely on concern over the unknown. Thus, while the record demonstrates that there is significant concern over these issues, the record does not support the conclusion that the visual impact of the Project will lead to the stated damaging results.

II. Commission Precedent Establishes that Visual Impacts are Addressed through Setbacks from Property Owners.

If the Commission adopts the recommendation in the Report, it would represent a significant departure from Commission precedent on the evaluation of visual impacts. Instead of applying the concrete setbacks established by the Commission, the Report seeks to replace the Commission’s consistent and objective approach with an entirely subjective evaluation of Project aesthetics and the relative value of natural resources, injecting the permitting process with significant uncertainty.

Minnesota has established a robust permitting framework for wind projects that balances the interests of promoting wind development and minimizing the impacts to the human and natural environments. This framework includes setbacks that take into consideration non-participating property owners, residences, and public lands, as well as roads, wetlands, native prairie, noise, shadow flicker, other wind turbines, and more.¹⁹ Consistent with Minnesota Public Utilities Commission (“Commission”) precedent, the Draft Site Permit for the Project includes all of these setbacks,²⁰ and the record clearly establishes that the Project design is compliant with all such applicable setbacks. In fact, the turbine locations in question far exceed the typical setback applied to non-participating

¹⁷ Report at ¶¶ 169-170 (emphasis added.)

¹⁸ *Id.* at ¶ 315 (emphasis added).

¹⁹ *Id.* at ¶ 89.

²⁰ Ex. 108. Draft Site Permit at §4.0.

property owners, including public lands of 3 rotor diameters (“RD”) in the non-prevailing wind direction and 5 RD in the prevailing wind direction. As shown in the follow table, the closest turbine, T3, is more than 3 times the setback distance of 5 RD (assuming a prevailing wind direction). Furthermore, the closest turbine the Report purports to allow, T36, is over 6 times the normal setback distance of 5 RD (assuming a prevailing wind direction). The difference between the distances and the setback are even greater when compared to the 3 RD setback for a non-prevailing wind direction.

Turbine	Distance (mi)	Distance (ft)	Distance (RD)
T3	1.32	6,969	15.5
T2	1.41	7,444	16.5
T35	1.44	7,603	17
A2	1.55	8,184	18
T36	2.72	14,361	30.5

The Report, however, fails to recognize these distances in its evaluation of the visual impacts of the Project, and further fails to provide any basis for applying a setback standard more than 6 times the setback standard for the type of receptors and resources in question. Instead, the Report arbitrarily leaps to the conclusion that removal of the 4 identified turbines is necessary for the Project to be compliant with applicable law, when in fact removal of the 4 identified turbines is designed simply to quell the complaints of certain Lake Cochrane landowners, which the Report acknowledges are highly subjective.²¹

Finally, the Commission setback standards are applicable to all receptors/resources of the identified category. This also is not limited to locations in Minnesota, and includes all receptors and sensitive areas located in South Dakota, including Lake Cochrane. In other words, the Project as designed treats residences, non-participating property owners, public lands, and other sensitive areas in Minnesota and South Dakota, alike. The Report, however, does not. Instead, the Report establishes a

²¹ Report at ¶ 192.

new standard applicable exclusively to Lake Cochrane, the effect of which is to afford public lands, natural resources, residences, and non-participating property owners outside of Minnesota greater protections than are afforded to Minnesota resources.

Accordingly, the Commission should not adopt the Report's subjective and inconsistent approach to siting standards, and instead consistently apply the established, objective setbacks proposed in the Draft Site Permit for Lake Cochrane as well as the rest of the Project area.

III. Property Owners in Minnesota Should Not Be Arbitrarily Denied the Right to Use Their Property.

While the Report may reach a conclusion that alleviates many concerns of the LCIA and its members, it does so to the detriment of property owners in Minnesota. By removing turbines and effectively imposing a limit on the proximity of wind turbines to Lake Cochrane, the Report impacts the rights of Minnesota landowners to use their private property. LCIA sought to have the Deuel County 3-mile zoning setback applied in Minnesota, arguing that the Deuel County process should be afforded deference as having already sufficiently evaluated the issue.²² Based on comments received in the Public Comment Period,²³ however, it is evident that interested landowners in Yellow Medicine County, Minnesota had no notice that the zoning proceedings and resulting 3-mile setback in neighboring Deuel County, South Dakota could prevent their participation in the Project, had no voice in that process, and do not support the application of a setback to the detriment of the landowners in Minnesota. While the LCIA and its members have concerns about the hypothetical impacts of the Project, if the Commission adopts the recommendation in the Report, the Minnesota landowners prohibited from having a turbine will have a much more substantial and concrete impact to their individual property rights.

²² See, e.g., LCIA Proposed Findings (Aug. 6, 2018) (eDockets No. 20188-145563-01).

²³ Written Comments of Richard Larsen (July 8, 2018); Public Comments Batch Two, Written Comments of Clayton Evans (July 10, 2018), Larry Fales (July 14, 2018), Marsha Gabrielson (July 12, 2018), Dan Lage (July 17, 2018), Doug Lage (July 16, 2018), Paul Tol (undated), Cindy Potz (July 11, 2018), Drew H. Wesner (July 10, 2018), and Paul Westphal (July 9, 2018) (eDockets ID 20187-145040-02).

IV. Flying Cow Wind Has Made Substantial Adjustments to the Project to Minimize the Potential Impacts to Lake Cochrane.

As Flying Cow Wind has highlighted previously, Flying Cow Wind has not ignored the concerns of LCIA, but rather has made multiple concessions in a good faith effort to alleviate their concerns and minimize potential impacts to Lake Cochrane. Specifically, Flying Cow Wind has (1) eliminated all turbine locations in South Dakota, (2) worked to site turbines away from Lake Cochrane as much as reasonably possible and in a manner that minimizes potential impacts, (3) eliminated the turbine closest to Lake Cochrane, turbine T1, from the Project layout (resulting in reduced sound modelling results to the vast majority of South Dakota receptors, as described below), and (4) agreed to install an aircraft detection lighting system (“ADLS”) to minimize nighttime lighting at the Project, an expensive technology that has not been required of other wind farms in the state.

V. Flying Cow Wind’s Exceptions and Proposed Changes to the Report.

Consistent with the Comments above, Flying Cow Wind proposes the following modifications to the Report:

FINDINGS OF FACT

4. The Project Boundary abuts the South Dakota border, ~~and is located within one-half mile of~~ Lake Cochrane, a spring-fed lake and recreation district in Deuel County, South Dakota, is located within one-half mile of the South Dakota border.⁸ The closest turbine to Lake Cochrane will be 1.32 miles away.

89. The Project will include setbacks for: (1) wind access buffer of five rotor diameters in the prevailing wind direction and three rotor diameters in the non-prevailing wind direction; (2) residences; (3) MPCA noise standard compliance; (4) public lands and public lands managed as grasslands; (5) USFWS grasslands and conservation easements; (6) USFWS wetland easements; (7) uninhabited structures; (8) public roads and trails; (9) microwave beam paths; (10) pipelines and wells; (11) railroads; and (12) communication towers.¹⁵² Flying Cow Wind considered receptors in Minnesota and South Dakota in analyzing and applying identified setbacks.¹⁵³ The closest turbine location to Lake Cochrane will be at a distance of 1.32 mi, which represents a setback from Lake Cochrane of over 15.5 rotor diameters.

170. ~~Lake Cochrane may be one of those “unique situations.”~~ It is a 355-acre spring-fed lake in Deuel County, South Dakota.²⁹¹ Lake Cochrane is one of only 103 lakes in South Dakota greater than

10 acres and is considered one of the top three lakes in South Dakota.²⁹² The South Dakota Department of Game Fish and Parks operates the Lake Cochrane Recreation Area on the north shore of Lake Cochrane.²⁹³ The recreational area offers camping, cabin lodging, picnic facilities, a playground, and a swimming beach.²⁹⁴ In 2017, the recreation area had over 10,000 visitors.²⁹⁵ In addition, the Department of Game Fish and Parks also maintains a public boat landing on the lake.²⁹⁶

194 Lake Cochrane is located less than one-half mile from the Minnesota South Dakota ~~Boarder~~Border.³⁴⁷ Several turbines will be ~~prominently visible and dominate the horizon as viewed from the Lake Cochrane Recreation Area.~~³⁴⁸ The closest turbine to Lake Cochrane is located approximately 1.32 miles from Lake Cochrane. ~~Numerous residents of Lake Cochrane have expressed concerns regarding the visual disruption to this natural resource and vigorously oppose locating any turbines within 3 miles of Lake Cochrane.~~³⁴⁹

224 In addition, the Lake Cochrane Recreation Area is located in Deuel County, South Dakota one-half mile to the west of the Project Boundary in Deuel County, South Dakota, and 1.32 miles from the nearest turbine.⁴¹⁵ The South Dakota Department of Game Fish and Parks operates the Lake Cochrane recreation area on the north shore of Lake Cochrane.⁴¹⁶ The recreational area offers camping, cabin lodging, picnic facilities, a playground, and a swimming beach.⁴¹⁷ There is also a well-used walking and running path that circles the lake.⁴¹⁸ There is also a public golf course adjacent to the lake.⁴¹⁹

Delete ¶¶ 313 – 316 in their entirety.

CONCLUSIONS OF LAW

8. ~~Removal of Turbines A2, T35, T2, and T3 is necessary for the~~ The Project is to be compatible with environmental preservation and the efficient use of resources.

9. The Project, with the Draft Site Permit conditions revised as set forth above ~~and removal of turbines A2, T35, T2, and T3,~~ satisfies the site permit criteria for a LWECs contained in Minn. Stat. § 216F.03 and meets all other applicable legal requirements.

10. The Project, with the permit conditions discussed above ~~and removal of turbines A2, T35, T2, and T3,~~ is compatible with environmental preservation, sustainable development, and the efficient use of resources.

11. The Project, with the permit conditions discussed above ~~and removal of turbines A2, T35, T2, and T3,~~ does not present a potential for significant adverse environmental effects pursuant to the Minnesota Environmental Rights Act and the Minnesota Environmental Policy Act.

VI. Conclusion

The record in these proceedings supports granting Flying Cow Wind a Certificate of Need and LWECS Site Permit for the Project as proposed by Flying Cow Wind. Flying Cow Wind respectfully requests that the Commission:

1. Issue to Flying Cow Wind a Certificate of Need for the up to 152 MW Bitter Root Wind Project;
2. Issue to Flying Cow Wind a LWECS Site Permit for the up to 152 MW Bitter Root Wind Project;
3. Adopt Findings of Fact and Conclusions of Law with the modifications to the ALJ Report as described herein.

Dated: September 20, 2018

STINSON LEONARD STREET LLP

/s/ Andrew Gibbons

Andrew Gibbons (#0389692)
Thomas Burman (#0396406)
50 South Sixth Street, Suite 2600
Minneapolis, Minnesota 55402
Telephone: (612) 335-1500
Facsimile: (612) 335-1657
andrew.gibbons@stinson.com
thomas.burman@stinson.com

Attorneys for Flying Cow Wind, LLC

Sean Flannery
Flying Cow Wind, LLC
Affiliate of Renewable Energy Systems Americas (RES)
11101 W 120 th Ave St
Broomfield, CO
80021-3436
United States

DNV GL – Energy
101 Station Landing, Suite 520,
Medford, MA 02155
Phone: 781-860-3089
Enterprise No.: 26-2535197
www.dnvgl.com/energy

Date: 20 September 2018
DNV GL reference: 10058202

Subject: 10058202 – Response to public comments on the visual simulations of Bitter Root Wind Project

Dear Mr. Flannery:

Flying Cow Wind, LLC, an affiliate of Renewable Energy Systems Americas, Inc. (RES) (the “Customer”) has requested that DNV GL Energy USA, Inc., formerly known as DNV KEMA Renewables, Inc. (“DNV GL”) provide environmental and permitting services, including visual simulation and sound modelling of the proposed Bitter Root Wind Project (the “Project”). DNV GL is a globally-leading quality assurance and risk management company that is independent from the Project and RES.

The purpose of this memorandum is to respond to comments from the Lake Cochrane Improvement Association, Ron Ruud Declaration for the proposed Bitter Root Wind Project on August 6, 2018 (“the Declaration”) regarding the visual simulations submitted for the Project.

The Declaration notes that the Lake Cochrane Improvement Association had “concerns about the accuracy of the photographic presentations” provided by DNV GL in advance of a public hearing on June 28, 2018. In response, the Declaration submitted a photo taken “from the deck of a Lake Cochrane resident with a Nikon Coolpix 520 with a 35mm focal length of 225mm.” The Declaration further states that “this provided a very narrow shot that would include several proposed turbines at varying distances from the lake.” The photo shows seven wind turbines in the immediate background of the lake, labeled T5, T12, T6, T11, T10, T3, and T36.

DNV GL submits the following comments in response to the Declaration and visual simulation attached to the Declaration.

1. Verification

The Declaration lacks key information about the parameters and methodology used to create the visual simulations, namely:

- The specific GPS location from where the photo was taken
- The dimensions of the turbines considered
- The orientation of the camera
- The software utilized to generate the simulation

It is standard industry practice to include this information to facilitate independent desktop corroboration and verification of the simulations, and/or to allow for field verification of simulation accuracy following construction of the subject project. Without this information, independent analysis and verification is more difficult, and the simulation more susceptible to manipulation.

2. Focal Length and Field of View

The simulation in the Declaration used a 35mm equivalent focal length of 225 mm, which is very uncommon for wind project visual simulations. Very large focal lengths, such as the one used in the Declaration, are equivalent to zooming in on a distant object to make it appear larger and closer than it would actually appear to the human eye from that particular viewpoint. Visual simulations in the wind power industry are typically not performed with large focal lengths because of this magnifying effect.

In addition to magnifying objects, using a large focal length also results in a very narrow horizontal included viewing angle, i.e., the portion of the horizontal plane represented in the image. For the visual simulation in the Declaration, the equivalent focal length of 225 mm translates to a horizontal included viewing angle of just over 9 degrees. DNV GL, however, recommends a larger horizontal included viewing angle to better replicate human sight – one of 35 degrees, as was used in DNV GL’s simulations, or more.

Using an included viewing angle that is less than the viewing angle of human sight has a distorting effect on the relative apparent proportions of objects in the foreground and background of an image, and results in an increase in apparent size of background objects² relative to the foreground. In other words, using a camera lens to zoom in on distant objects, or cropping a photo, does not produce the same result as moving in closer to the object.¹ The following images, taken from Google Street view, illustrate this phenomenon.

¹ See Reply Comments of Flying Cow Wind, LLC at Exhibit B (Aug. 6, 2018) (eDockets ID 20188-145568-01).



Picture 1: Relative proportions between a turbine and foreground structure from a "far" viewpoint and enlarged image.



Picture 2: Relative proportions between a turbine and foreground structure from a "close" viewpoint and enlarged image.

Picture 1 above illustrates the relative scale of a wind turbine in the background and a small structure in the foreground. In this example, the turbine appears to be three times the size of the foreground structure when the viewpoint is located far away. A cropped and enlarged picture (on the right) is also included to illustrate what the use of a much larger focal length would have yielded from this same viewpoint.

In contrast, Picture 2 above shows the same two objects from a closer distance. A cropped and enlarged image (on the right) is again provided for clarity. In this set, the foreground object is much closer and larger in size, but the turbines appear to be only slightly larger than in the first picture set, illustrating how relative proportions shift when the distance of the viewpoint changes.

Comparing the two picture sets, in the enlarged image in Picture 1, the foreground object appears to be roughly the same size as it appears in the normal picture in Picture 2. The wind turbine in the enlarged image in Picture 1, however, appears to be significantly larger – 3 or 4 times the size – relative to the foreground object, whereas the turbine in Picture 2 appears only slightly larger than the foreground object. This example clearly demonstrates that moving closer to an object is not the same as zooming in from farther away by using a large focal length or enlarging a photo.

3. Comparison to Declaration Simulation

This distorting effect of using a large focal length and narrow included viewing angle is important in considering the visual simulation included in the Declaration. DNV GL compared the Declaration’s visual simulation (Picture 3 below) to the nearest view from 220th avenue, northeast of Lake Cochrane, available via Google Streetview (Picture 4 below)². Although Picture 3 and Picture 4 were taken from approximately the same distance from the water pumping facility, the water pumping tower is notably much smaller in Picture 4 than in Picture 3. This demonstrates the magnifying effect of the large focal length used for the visual simulation in the Declaration.


² Approximate coordinates of Google Streetview viewpoint: 44°43'6 N, 96°26'53 W. On 220th street looking south, at a distance 0.9 miles from the water tower. This distance is comparable to the distance between the water tower and the eastern shore of Lake Cochrane.



Picture 3. Declaration submission with water pumping tower circled



Picture 4. Google Streetview image from 220th avenue looking south with water pumping tower circled



The visual simulation in the Declaration (Picture 3) can be likened to the enlarged view in Picture 1. The image was taken from considerable distance from the water cooling tower with a large focal length and narrow included viewing angle. Like in Picture 1, this gives the false impression that zooming in is equivalent to moving to a closer viewpoint, i.e., that a zoomed picture from the northwestern shore of Lake Cochrane is equivalent to human sight from a viewpoint closer to the eastern shore of Lake Cochrane.

In reality, the more one approaches the eastern shore of the lake, the more the perceived height difference between T3 and foreground objects, such as the water pumping tower and houses on the shore, would decrease. Conversely, if one were to move further away, the objects in the foreground would become smaller at a much faster rate than the turbines. This underlines the importance of evaluating visual simulations as a whole, on an absolute scale, as was done in DNV GL's original simulations, and not only on a relative scale. Simply comparing turbine sizes to the size of other known objects in the image and enlarging/zooming the result distorts the overall visual impact to a human observer on an absolute scale.

For these reasons, the visual simulation in the Declaration does not accurately represent the actual visual impact that would be perceived by a human standing at the northwestern shore of Lake Cochrane. Just as DNV GL's visual simulations should only be considered to be representative of the specific viewpoint from which the picture was taken, the visual simulation in the Declaration should only be considered for what it represents, which is, at best (assuming everything else is verified), a visual simulation of the Project from the northwestern shore of Lake Cochrane as perceived through the lens of a camera zoomed to a focal length of 225 mm.

Conclusion

DNV GL has a long legacy of providing visual simulations specific to the renewable energy industry. We are the leading renewable energy consultancy in the world. In the last four years, DNV GL has provided independent, technical due diligence for over 80% of the wind projects subject to project financing in North America. The methodology used to create the visual simulations is accurate. DNV GL has a well-defined set series of steps and procedures that must be followed to ensure visual simulations are correctly generated. DNV GL has field-verified and validated this visual simulation methodology on other wind energy projects through comparisons of the simulated results before construction with actual photographs after construction. These comparisons show that the shape, scale and location of the post-construction photographs match the pre-construction visual simulations.

DNV GL reiterates that the purpose of visual simulations, per the request from the Minnesota Department of Commerce, was to show what the turbines would look like from a variety of publicly accessible viewpoints to give the public a sense of scale. The visual simulations yielded by DNV GL's methodology are based on industry best practices and DNV GL's extensive experience as a third-party renewable energy engineering consultancy, to provide a realistic view of what the project would look like from the specific vantage point selected.

NAME	EMAIL	SERVICE
Susan Medhaug	susan.medhaug@state.mn.us	Electronic
Debra Moynihan	debra.moynihan@state.mn.us	Electronic
Bob Patton	bob.patton@state.mn.us	Electronic
Janet Shaddix Elling	jshaddix@janetshaddix.com	Electronic
Cynthia Warzecha	cynthia.warzecha@state.mn.us	Electronic
Daniel P. Wolf	dan.wolf@state.mn.us	Electronic

Dated this 20th day of September, 2018

/s/ Tammy J. Krause

Tammy J. Krause