

Yet extracting valuable materials from the turbines is not as easy as it sounds. For example, the copper in the wires used to transmit power from the turbine to the grid will have to be stripped of its plastic insulation, a task which would entail serious labor costs.

Also, the sheer size of the steel casings which provide the base of the turbines would take specialized cutting tools to reduce the steel to manageable or transportable chunks.

And the blades themselves are a high-tech wonder of composite material, which most experts agree cannot be separated into its component materials and is thus worthless for recycling.

"The blades are composite, those are not recyclable, those can't be sold," Linowes said. "The landfills are going to be filled with blades in a matter of no time."

Faith in doing the right thing

In Cameron and Willacy counties, the operational wind farms are Cameron Wind, Los Vientos I and II, Magic Valley Wind Farm and the new San Roman Wind Farm. The turbine count for these is approximately 400 operational turbines.

At a cost of \$200,000 each, decommissioning these turbines when their working life expires would cost \$80 million.

At Duke Energy's Los Vientos I and II wind farms in Willacy County, there are 191 wind turbines. Across Texas at various locations, Duke has around 900 wind turbines which are operational.

"At each of our wind sites, for example, built into the construction and operational costs is also a plan for decommissioning," said Tammie McGee, director of corporate communications for Duke.

Duke Energy, which has been in the power business for more than 100 years, is relatively new to the wind industry. McGee said Duke began investing in wind power generation about a decade ago.

She said although Duke hasn't been around long enough to decommission turbines, plans are in place to "repower" aging wind site locations by upgrading — resurrecting — the equipment.

"What does happen a lot of times, and is happening now around the country, is sometimes instead of decommissioning they will 'repower' a site," she said.

"That involves replacing the turbines on top of the towers with new technology," McGee added. "In the atowers, too, and put up new and more modern towers."

If a site is properly located, the winds will still be there, making repowering an attractive financial option since the costs of site selection and development have already been covered.

Most wind farms, which pay landowners on average around \$8,000 a year per turbine, have contracts with renewal clauses that stretch out to 50 or 60 years.

If Duke decides to shutter a power plant, including its wind farms, the company is committed to restoring the site to its previous state, she said.

"Regardless of fuel type, whether its gas or coal or wind or solar, once a power plant is no longer in service we restore the land to how it was before we got there," McGee said.

Calls seeking comment from two other wind energy companies operating in Cameron County, Apex Clean Energy which operates Cameron Wind and Acciona United States, which runs the San Roman Wind Farm near Laguna Vista, were not returned.

Unlike Duke Energy, some of the smaller wind farm companies operating in Texas, with fewer financial resources, may be tempted to just walk away when aging turbines no longer spin a profit.

Linowes believes such moves may begin occurring even before wind turbines outlive their useful life as manufacturing warranties on the big turbines expire.

“At what point does the cost of maintenance tip over to the point it’s not worth maintaining a turbine?” she said. “We’re in something of an unknown or uncertain territory.”

As wind turbine manufacturing has improved, the length of warranties on these products has decreased dramatically and today the terms of most cover between five and 10 years.

It seems paradoxical that warranties would become shorter as products become better, but many wind turbine manufacturers have found a valuable revenue stream in selling extended warranties, similar to companies which sell appliances to consumers.

“It could be a very ugly situation in the next five years when we see turbines need work, and are no longer under warranty and not generating enough electricity to keep running them,” Linowes said.

rkelley@valleystar.com

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. EL17-055

**IN THE MATTER OF THE CROCKER WIND FARM, LLC, PERMIT
APPLICATION FOR A WIND ENERGY FACILITY AND 345 KV
TRANSMISSION LINE IN CLARK COUNTY, SOUTH DAKOTA**

**Direct Testimony of David Lawrence
On Behalf of the Staff of the South Dakota Public Utilities Commission
March 28, 2018**

1 **Q: State your name and occupation.**

2 A: My name is David Lawrence, and I am a real property appraiser.

3

4 **Q: State your business address.**

5 A: My business address is 4820 E. 57th Street, Sioux Falls, South Dakota.

6

7 **Q: By whom are you currently employed?**

8 A: I am a real property appraiser with DAL Appraisal & Land Services.

9

10 **Q: Please state your educational and professional background.**

11 A: I received a Bachelor of Business Administration from Western State College
12 University in Gunnison, Colorado. After completing a four-year degree, I worked in
13 real estate development, site acquisition, and management for a nationally
14 branded franchise system. My career transitioned to real property valuation, and
15 I began work with the RJ Hobson Appraisal Firm. I continued my real property
16 studies with the Appraisal Institute earning the MAI designation, the SRA
17 designation, and the AI-RRS designation. After completing my designations with
18 the Appraisal Institute, I continued my real property studies with the International
19 Right of Way Association, earning the SR/WA designation. I am currently active
20 in the Appraisal Institute, the International Right of Way Association and the
21 Professional Appraisers Association of South Dakota.

22

1 **Q: Can you briefly describe the requirements to be a real property appraiser**
2 **in South Dakota?**

3 A: The South Dakota Appraisal Certification Program has four types of license
4 levels for performing valuation services. The State-Registered Appraiser (entry
5 level), State-Licensed Appraiser (mid-level licensure), State-Certified Residential
6 Appraiser (highest level of residential certification), and the State-Certified General
7 Appraiser (highest level of certification). The first three license levels have scope
8 of practice limitations, with an emphasis on residential property. The State-
9 Certified General Appraiser license is without limits to property type or complexity
10 for an appraisal assignment. The residential license levels require holding an
11 associate degree or higher from an accredited college. The State-Certified General
12 Appraiser license requires a bachelor's degree or higher from an accredited
13 college or university. Beyond the college or secondary education, each license
14 level has specific appraisal education and experience requirements, national
15 testing and peer work product review in conformance with the Uniform Standards
16 of Professional Appraisal Practice (USPAP) and the laws of South Dakota.

17

18 **Q: What level of appraisal credentials do you hold with the State of South**
19 **Dakota?**

20 A: I am a State-Certified General Appraiser.

21

22

1 **Q: What are some of the relevant definitions and laws that apply in South**
2 **Dakota for valuation services pertaining to appraisal practice?**

3 A: Establishment of qualification and standards for appraisal practice in South
4 Dakota was a direct result of the economic turmoil caused by the abuse of the
5 appraisal process in the 1980s, commonly referred to as the savings and loan
6 crisis. Prior to Title XI of FIRREA, the appraisal profession was unregulated, and
7 any individual could represent themselves to the public as a real property
8 appraiser. In 1989, the USPAP was developed with the express purpose of
9 promoting and preserving public trust and confidence in the appraisal profession.
10 The USPAP achieved legal authority in South Dakota by adoption and regulation
11 in South Dakota Codified Law (SDCL) Chapter 36-21B and South Dakota
12 Administrative Rules (ARSD) Article 20:14.

13

14 SDCL 36-21B-1 mandates, *“any person who performs a real estate appraisal or*
15 *advertises or holds himself or herself out to the general public as a real estate*
16 *appraiser in South Dakota shall be certified, licensed or registered by the*
17 *Department of Labor and Regulation unless exempt under another provision of this*
18 *chapter or another provision of the statute.”*

19

20 ARSD Article 20:14 provides the criteria for appraisal practice, and what valuation
21 disciplines are regulated by the Appraisal Certification Program for providing
22 valuation services within South Dakota. For the purposes of determining what

1 constitutes appraisal practice in South Dakota, the performance objectives are
2 provided in ARSD Article 20:14 for practitioners providing valuation services.

3
4 Appraisal Practice is defined as, *"valuation services performed by an individual
5 acting as an appraiser."* It is the expectation of the valuation service that makes
6 one an appraiser, not the holding of any specific credential or state license.

7
8 An Assignment is defined as, *"a valuation service that is provided by an appraiser
9 as a consequence of an agreement with a client."* Assignment results include an
10 appraiser's opinions or conclusions developed in an appraisal assignment and are
11 not limited to value. For example, if a client hires an appraiser to provide opinions
12 and conclusions about the certain impacts a project has on real property values,
13 this would constitute an appraisal assignment.

14
15 An Appraiser is defined as, *"one who is expected to perform valuation services
16 competently and in a manner that is independent, impartial and objective."*

17
18 An Appraisal is defined as, *"the act or process of developing an opinion of value
19 of real estate for another and for compensation."* South Dakota has adopted a
20 specific definition of what constitutes an appraisal. *"An appraisal must be
21 numerically expressed as a specific amount, as a range of numbers or as a
22 relationship."* For example, if an appraiser provides an opinion about the effects
23 an overhead transmission line can have on residential properties values within the

1 vicinity of the project, that constitutes an opinion of value in South Dakota because
2 it provides an opinion as to the relationship on value to a specific property type
3 within the project. It doesn't matter if the value opinion is expressed as +10%, 0%,
4 -5% or -50%, or a stated conclusion that a project will not have an effect on real
5 property value; it is an opinion of the relationship of value to a specific property
6 that is applicable to the definition that makes it an opinion of value.

7

8 In South Dakota, only appraisers can offer services that are considered appraisal
9 practice that pertain to valuation services. South Dakota is a mandatory appraisal
10 state and the laws are specific to any person representing themselves to the public
11 as a real property appraiser. If a person is providing an opinion of value for
12 compensation in South Dakota, that person is required to be licensed by the
13 Appraisal Certification Program and have the required education, experience and
14 competency for the assignment and property type, including being geographically
15 competent within the market area of the assignment. South Dakota provides these
16 requirements to appraisers in order to elevate appraisal practice to a level of
17 objectivity and independence that is worthy of public trust and confidence.

18

19 **Q: What work experience have you had that is relevant to your involvement**
20 **in this project?**

21 A: I have a wide range of appraisal experience and geographical competency
22 across South Dakota and neighboring states including property types such as
23 residential, commercial, ranch and farm. I've been fortunate in my appraisal career

1 to have worked across the diverse market areas of South Dakota, including East
2 and West River. Most of my appraisal experience is in right-of-way, linear and
3 energy projects. I have provided appraisals for right-of-way acquisitions,
4 condemnation, and damage property cases. I have managed the appraisal
5 process for several recent energy and large-scale linear project in South Dakota
6 including Keystone L.P., Keystone XL and the Dakota Access pipelines. As part
7 of my practice, I provide appraisal services for damaged property and diminution
8 value studies. These assignments have ranged from measuring the impacts of a
9 high-voltage transmission line on residential property values, to analyzing the
10 impacts of the 2011 Missouri River flood on residential and agricultural property
11 values in Union County. In the last nine years, I've completed several studies
12 analyzing the impacts of underground pipelines on agricultural land values in
13 Montana, South Dakota, Minnesota, and Nebraska. I have extensive experience
14 in South Dakota developing damage studies and their relationship to properties
15 values. I've developed South Dakota impact studies on the Keystone Phase I,
16 Keystone XL, NuStar, SDIP, Northern Border, Lewis & Clark, Magellan, Rockies
17 Express, and MDU pipelines. The scope of work for these projects, includes sales
18 analysis studies, site impact studies, and highest and best use studies across
19 South Dakota, from border to border. My various impact studies have relied upon
20 survey-based research with hundreds of South Dakota market participants
21 impacted by an energy project, and sales research in every county which the
22 projects occupy. My experience with impact studies across the state has given

1 me the competency and knowledge to correctly research and apply the
2 methodology for credible analysis.

3 **Q: Have you testified before the South Dakota Public Utilities Commission?**

4 A: No.

5

6 **Q: On whose behalf was this testimony prepared?**

7 A: This testimony was prepared on behalf of the Staff of the South Dakota Public
8 Utilities Commission.

9

10 **Q: What is the purpose of your testimony in this proceeding?**

11 A: The purpose of my testimony is to assist the Commission in understanding
12 South Dakota appraisal requirements, valuation principles and techniques, and
13 how they can be appropriately applied to estimate value impacts from the Crocker
14 Wind Project, and other wind energy projects in South Dakota.

15

16 **Q: What materials have you reviewed in this matter?**

17 A: I have reviewed the Application and Appendix I to the Application, "The Impact
18 of Wind Power Projects on Residential Property Values in the United States." In
19 addition, I reviewed the direct testimony of Mark Thayer, including Exhibits 1
20 through 19 attached to his testimony.

21

22

23

1 **Q: In your opinion, do the studies and testimony of the applicant adequately**
2 **reflect the potential impact to the value of properties in the vicinity of the**
3 **proposed Crocker Wind project?**

4 A: It is my opinion that the studies and testimony do not provide adequate market
5 evidence that can be applied to the subject area of the Crocker Wind Project. Most
6 of the studies only present a statistical analysis of a large, well-defined residential
7 dataset not necessarily applicable to rural South Dakota property values impacted
8 by wind energy projects. The studies and testimony do provide a starting point to
9 gauge the potential impacts upon residential property values, but do not address
10 the potential impacts, if any, that a wind farm can have on agricultural land classes.

11

12 **Q: Please explain why the studies and testimony are not reflective of the**
13 **potential impact the Crocker Wind project may have on land value.**

14 A: Most of the studies, articles, and testimony focus on the hedonic regression
15 method for determining the effects on residential property values resulting from a
16 wind energy project. To estimate the value of real property using the hedonic
17 mathematical equation, property characteristics or independent variables are
18 identified that contribute to market value such as view, shape, topography,
19 location, and utility. By including proximity or view of a wind energy project or wind
20 tower as a variable in the regression the appraiser can better estimate the negative
21 or positive impact the wind energy project or tower will have on the value of the
22 property. The hedonic analysis has been an accepted methodology in the
23 appraisal profession for years; however, it has limitations. One significant

1 weakness of hedonic analysis was pointed out in the winter 2012 edition of the
2 Appraisal Journal. In the article James Chalmers, PhD states, "(hedonic
3 analysis)...does not rule out the possibility that some individual properties are
4 significantly affected nor provide any insight into the conditions shared by those
5 individual properties that make them vulnerable to transmission line impacts." In
6 my experience with damages studies, I have found Chalmers' statement to be valid
7 in analyzing properties affected by an energy project. To truly gauge the value
8 impacts from a project, the methodology needs to address more than just a
9 mathematical analysis of a large data set from different market areas from around
10 the United States. The study needs to analyze market evidence from specific and
11 surrounding market areas that would be applicable to the impacted property type,
12 and in some cases, individual analysis of an affected property.

13
14 **Q: Please explain the limitation of the studies and direct testimony of the**
15 **applicant as they would apply to the impacts upon property values in South**
16 **Dakota, for the proposed Crocker Wind project?**

17 A: While I have read through the exhibits, my comments will specifically address
18 the report developed by Crocker's valuation expert, Mark Thayer:

- 19 • The study and direct testimony conclude that the LBNL research is
20 transferable to South Dakota properties in the neighborhood of wind
21 facilities. I disagree. The LBNL studies only focus on residential property
22 values from populated areas in the United States including New York,
23 Texas, Washington, Wisconsin, Illinois, and others. South Dakota property

1 characteristics are not comparable to the areas of LBNL studies. For
2 example, on Page 13 of Mr. Thayer's direct testimony, the Applicant
3 attempts to make the data applicable to South Dakota by concluding
4 Minnesota and Iowa counties are quite similar to South Dakota
5 counties....*"But the South Dakota counties look very much like their*
6 *Minnesota counterparts, especially Cottonwood County and Jackson*
7 *County and Franklin and Sac counties in Iowa are also quite similar to South*
8 *Dakota counties."* While I agree there are some overall similarities for
9 comparison of highest and best use, the data shows these Minnesota and
10 Iowa counties are all superior regarding population, median home value,
11 population density, and production capability. Mr. Thayer's study averages
12 Clark, Codington, and Grant Counties' demographics for comparison, but
13 this can provide misleading results for analysis. For example, the population
14 of Codington County is nearly eight times that of Clark County. The county
15 seat, Watertown, is the fifth largest city in South Dakota with significant
16 industrial and retail facilities. Clark is the sixty-second largest city in South
17 Dakota and like many rural communities in our state face significant
18 obstacles to growth and prosperity, including declining (-8% 2016)
19 population. As well, median home values are skewed by Watertown's
20 population and recreational homes on Lake Kampeska, Pelican Lake and
21 Big Stone. Big Stone Lake is in Grant County and not a county impacted by
22 the project. Franklin, Sac, Cottonwood, and Jackson have an approximately
23 65 percent larger population, 76 percent larger population density and a 17

1 percent higher median home value when compared to Clark County.
2 Median income levels are similar for comparison; however, when compared
3 to the median home value, the typical market participant in Franklin, Sac,
4 Cottonwood and Jackson County has less effective purchasing power than
5 the typical buyer in Clark County South Dakota. Additionally, land values
6 are dramatically different, with Sac County reporting an average 2016 land
7 value of \$8,858 per acre, Franklin reporting an average 2016 land value of
8 \$7,538 per acre, and Jackson and Cottonwood reporting an average 2016
9 land value of \$7,195 per acre as compared to the 2016 average land value
10 for Clark County of \$4,300 per acre¹. County soil productivity comparisons
11 are also superior to Clark County. Clark County has an average soil
12 productivity index of 65.1 as compared to the soil index of Cottonwood at
13 86, Jackson at 84.5, Sac at 82.1 and Franklin at 79.2². There are
14 similarities; however, no basis for a direct comparison to Clark County.

- 15
- 16 • The direct testimony and study opine *"the planned wind projects in South*
17 *Dakota will not significantly reduce the sale prices of properties in the*
18 *neighborhood of the wind facility."* The conclusion is not supported by the
19 evidence. The research and studies are limited to the impacts of wind
20 energy projects on residential property values. The Crocker Wind Project is
21 in Northwest Clark County. Approximately 94 percent of the county acreage

¹ AG Decision Market Iowa State University www.extension.iastate.edu/aqdm 2016. SDSU Igrow 2017. University of Minnesota Agricultural and Natural Resource Sciences, 1990-2016

² Agridata Surety Pro

1 is used for agricultural production, and six percent for other uses. The
2 county is rural in nature with farming as the principal economic enterprise.
3 Hunting is another important economic enterprise, as the county is in the
4 major flyway for migrating waterfowl. All Clark County agricultural land
5 classes will be impacted by the Crocker Project area, including rural
6 residential. The conclusion relies on the LNBL study that focuses on
7 residential property values, and then broadly applies the results to all types
8 of properties in South Dakota. There is no market data to support this
9 conclusion. South Dakota property types include productive crop ground,
10 native pasture, grass, hay, rural residential, and recreation highest and best
11 uses. Analyzing mass residential sales data from around the United States
12 and generally applying the analysis to all South Dakota property types could
13 mislead the public and the Commission.

14
15 **Q: In your opinion, does the services provided by Crocker's value expert fall**
16 **under appraisal practice as defined by the laws and regulation in South**
17 **Dakota?**

18 A: Expectation is a crucial component for determining when an individual is
19 providing valuation services as an appraiser. It seems clear by the evidence
20 presented by Crocker, that Mark Thayer has been engaged as a valuation expert
21 to answer the client's questions about effects on real property values from the
22 Crocker Wind Farm. In the direct testimony and report by Mark Thayer, both

1 opinions and conclusions have been provided to measure the effects on the value
2 of real property:

3
4 *"Based on this extensive literature, the planned wind project in South*
5 *Dakota will not significantly reduce the sales prices of properties around the*
6 *wind facilities."*

7
8 *"We would be confident that the LBNL studies would be a reasonable*
9 *source for a benefit transfer (or damage) effort to South Dakota."*

10
11 *"This leads to the overall conclusion that the planned wind projects in South*
12 *Dakota will not significantly reduce the sales prices of properties in the*
13 *neighborhood of the wind facilities."*
14

15 In South Dakota, any valuation service performed by someone who is acting as an
16 appraiser is appraisal practice and subject to the laws and regulation of South
17 Dakota. An individual must be licensed or certified by the Appraiser Certification
18 Program or must apply for a non-resident temporary practice permit for a single
19 appraisal assignment.
20

21 **Q: Based on your experience, please explain what type of study would**
22 **adequately reflect the potential impact to the value of properties in the**
23 **vicinity of the proposed Crocker Wind project?**

24 A: A comprehensive study from the market area of South Dakota will provide the
25 evidence that is required to determine the potential impacts of a wind energy
26 project on property values. In South Dakota, there are approximately thirteen
27 operating wind energy projects. Some of these wind energy projects have been in
28 operation since the early 1990's and includes all types of South Dakota property.
29 The methodology that is applicable for comparison in this type of study is referred

1 to as the case-by-case sales comparison approach which provides a more reliable
2 alternative to the hedonic analysis. This analysis uses the traditional appraisal
3 methods of interviews, sales comparison, and paired sales analysis. A South
4 Dakota study should include analyzing all operating wind energy projects from
5 around the state and include a wide representation of the property characteristics
6 including agricultural, residential and mixed land uses. The study should identify
7 the characteristics that would make properties prone to value effects such as size
8 and use and analyze if certain property types are more susceptible to value
9 impacts from wind energy projects. The study should also incorporate survey-
10 based research to measure the potential effects. The survey-based methods are
11 used as an alternative to statistical price analysis to estimate potential impacts
12 from a wind energy project. The survey would use a scientific method and
13 acceptable methodology in the appraisal process that could be applied to
14 geographical areas like South Dakota where the sales population is limited. The
15 results of the case-by-case analysis could be compared to the LBNL studies to
16 determine if the results are consistent with national market evidence.

17
18 **Q: Please explain why this type of study would more adequately reflect the**
19 **potential impact to land value.**

20 A: Crocker Wind Farm, LLC has presented a study covering residential property
21 values from different market areas of the United States. While I do agree these
22 studies provide useful insight to understand the general impact on residential
23 property values, they do not apply to the market characteristics and land classes

1 that are predominately impacted in South Dakota. To truly understand the impacts
2 of a wind energy project in South Dakota, a valuation expert needs to use research
3 that is applicable to the market area of study and market evidence specific to the
4 property type.

5

6 **Q: What is the process for preparing this type of study?**

7 A: The general approach of this study would identify and examine all arm's length
8 transactions involving properties within a wind energy project area in the South
9 Dakota. The general steps for the study would be: 1) Identify properties affected
10 by a South Dakota wind energy project since the time the project became
11 operational; 2) Organize the properties into common ownership and property
12 types; 3) Research the chain of title for each property ownership from the
13 operational date of the wind project to current effective date of the study; 4) Study
14 the title history to identify transfers in ownership that appear to be arm's length and
15 qualify per South Dakota's definition of fair market value; 5) Conduct site
16 inspections and interview buyers and sellers to establish the sales qualifies as an
17 arm's length transaction, and if so, verify transaction details and gather information
18 on terms of the sale, participant motivation and effect of the wind project, if any; 6)
19 For each sale, collect and verify data on comparable property sales not within the
20 proximity of a wind energy project for comparison (unaffected sales); 7) Conduct
21 survey-based research with market participants as an alternative to statistical price
22 analysis to estimate the potential impacts from a wind energy property; 8) Analyze
23 the survey based research, interview data and the market data to reach a

1 conclusion in regards to the effect of the wind energy project or wind tower, on the
2 value of the applicable property types; 9) Prepare a work file of the research to
3 support the analysis and conclusions; 10) Prepare a study report summarizing the
4 research and findings. The study would include individual sale analysis for all
5 properties types impacted by wind energy projects statewide, including farm and
6 ranch, residential, and rural residential.

7

8 **Q: What would be the timeline necessary to prepare such a study?**

9 A: Depending on the scope of work and project area selected, approximately six
10 months would be an anticipated timeline for project completion.

11

12 **Q: What is the approximate cost of preparing such a study?**

13 A: Cost depends on the scope of work agreed to with the client. In South Dakota,
14 a comprehensive study of this type would be required to have an extensive level
15 of quality and research that could withstand scrutiny from courts and peer review,
16 as well as assure the public that due diligence has been done to answer the
17 questions about impacts on property values.

18

19 **Q: Why did you not prepare a study like you just described?**

20 A: I had several discussions about this with Staff. Unfortunately, it was impossible
21 to properly conduct a study in the time provided by statute. As I stated previously,
22 it would take six months to complete an accurate study. This would not include

1 the time it would take to contract for services, conduct discovery and do necessary
2 investigation, prepare testimony, and participate in an evidentiary hearing.

3

4 **Q: Are you aware of any available studies of this nature that would**
5 **adequately reflect the potential impact to land value of properties in the**
6 **vicinity of the proposed Crocker Wind project?**

7 A: No. I'm not aware of any South Dakota study exactly like the one required.

8

9 **Q: Does this conclude your testimony?**

10 A: Yes.

Call,

This is information that was requested by a couple of Commissioners and Mr. Knight. Please forward this email to Mr. Knight and all of the Commissioners.

Thank you,

Brenda Taylor

This letter is provided in response to the request by the board made at the Feb. 7, 2017 regular Commissioners' Meeting regarding Wind Tower effects on Property Values.

I spoke to Mr. David Janes of the Toronto area about his experience trying to sell his home. He told me that he tried to sell it himself for a short period of time. I also spoke with a person who looked at Mr. Janes' home during that time and decided his family could not live there because of all of the wind towers surrounding the property. Mr. Janes then contacted two realtors, one located in Sioux Falls and the other in Brookings. They both recommended to Mr. Janes that putting his home up for auction would be his best option.

After speaking with an appraiser and several realtors, the consensus was that it would be costly and would take many weeks, even months, to compile actual data to prepare a complete report. It was, however, recommended that governing bodies should pursue such information.

Katie Murray, a realtor with Century 21 in Brookings, did state that homes located near wind towers absolutely experience property devaluation. She gave as an example a home located in the middle of a wind farm in Brookings Co. which was listed and viewed 15 times. All of the prospective buyers walked away, not wanting to live near wind towers. She stated that homes that would normally sell quickly are not selling as they should when located near wind towers. A statement she sent via e-mail follows:

"In my experience, wind towers do affect a buyers desire to purchase a property. One particular listing was in a wind farm, had numerous showings, and the majority of feedback was an issue with the towers. This home was priced well, comfortable distance to a city, and almost fully remodeled. It should have sold quickly, but did take longer and for assumably [sic] less than what they would've gotten had the wind towers not been so close."

I also contacted an appraiser, Mr. Brian Gatzke, ARA, MBA, Certified Appraiser from Northern Plains Appraisals located in Brookings. Mr. Gatzke told me about two homes that were located in Brookings Co. before the wind towers went up and the homeowners tried to sell after the towers were built. Both homes were greatly discounted before they could be sold. One was sold to an adjacent landowner. Mr. Gatzke also said that wind towers do have a negative impact on residential properties. I asked him if appraisers take into account the surroundings of a residential property when writing their reports, and he replied, "Yes, appraisers do have rules and need to verify market conditions and the surroundings of a property and it does show up in a report. Surroundings do have an impact on appraisal values." He has concluded that wind towers do, in fact, negatively impact appraisal values. He also suggested that counties should do complete and thorough investigations giving three examples how this might be accomplished. It is a costly and time consuming endeavor.

My goal was to gather local information only regarding residences located near wind towers. Again, those who talked to me stated that they did not have time to do actual research but shared their experiences. I attempted contact with other resources that chose not to respond.

Mike and I have provided emails with links to property devaluation studies of residences due to close proximity to wind towers done by Michael McCann. Please feel free to contact me if you would like more information.

In light of what we have learned, we strongly advocate for Property Value Guarantees in the Ordinance.

Thank you for your time,

Brenda Taylor

001736

My Name is David Janes. I live at 19574 479th Avenue in Deuel County. My phone numbers are land 605-794-2023 and mobile 605-695-5114.

My wife Linda and I bought acreage of 15 acres about 2 miles Southeast of Toronto in 1999. We built a new house with 2 x 6 studs, sheathing and a full brick veneer. Our walls are nearly 12" thick. We took occupancy in 2001. We intended for this to be our retirement home.

A few months after we moved in we were asked by a neighboring farmer if we had any objections to wind towers in the neighborhood. We were not in favor of any within our immediate area. Much to our surprise wind tower construction proceeded in 2003 without any prior notification to us.

While the 1,000 foot setback was probably used it makes no difference. The shadows from the turbine blades hit our house from all directions every day! And even with the limited available light at night you are still able to see shadows moving across the house. It is especially disturbing during any outdoor activities. Sometimes it is absolutely shocking and makes you think someone is creeping up behind you. The flashing red lights are almost as distracting as the blade shadows. There is never a peaceful night of solitude.

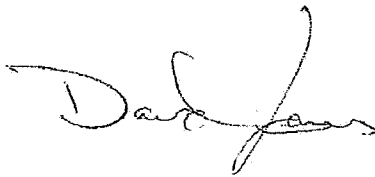
We installed blinds and draperies and are still getting that light sweep through and around the windows. The noise is even worse. We are NEVER left in silence when the turbines are active. When there is moisture in the air it can sound like the roar of a jet engine.

We invested over \$500,000 in our home but we had to live with headaches caused by the constant flashing and noise. We even bought a camper for the sole purpose of getting away to a peaceful location for a month or more at a time. Unfortunately my wife Linda passed away last year. The peace and solitude we expected has been completely taken from us. If I could get my investment back I would do so and leave immediately.

David Janes

19574 479th Avenue

Astoria, SD 57213



3-18-17

INDEPENDENT

Living with wind farms

Wind turbine noise too much for South Dakota homeowner



Photo by Jody Isaackson David Janes of rural Toronto, South Dakota, stands outside his home which is overshadowed by a wind turbine. His entire place is nearly in the middle of a wind farm, and the noise and shadow flicker are disturbing his peace in more ways than one.

TORONTO, S.D. — While the wind power companies tout the economic benefits of planting not one, but two wind farms in Lincoln County, some neighbors are fearing the possible negative impacts.

A Deuel County, South Dakota, resident says he found out the hard way there are drawbacks to having a renewable energy source in his backyard.

David Janes of rural Toronto, South Dakota, said he and his late wife had built a retirement home on their South Dakota farm site 17 years ago. They never suspected that the peace and tranquility of their location would be dramatically changed.

"I like to sit in the backyard and listen to the birds sing," Janes said. "But when the turbines are running, I can't hear the birds. All I hear is swoosh, swoosh swoosh, like a jet plane engine."

The wind farm was constructed nearly 10 years ago and Janes said he never received a notice that his neighbor had sold the land rights to an energy company. He also said he was given no warning about how noisy the turbines could be, even at the 1,200 feet setback.

"The nearest one is 1,200 feet away, but it towers over my house," Janes said.

He also said he purchased special window shades for those times in the morning and evening that the shadow flicker from the rotating propellers creates quite a distraction inside the house.

"It gave us headaches," he said. "They don't have to be so close to people's house. They're not good for people to live near. They're only good for farmers who don't live near the towers."

Janes has also noticed grease leaking from the turbines. The gray discoloration was slowly making its way down from the gear house at the

top of the tower behind his house. He was wondering if that was going to slow down the energy production or just create an environmental hazard.

"I tried selling the place once, but there were no takers," Jane said. He's afraid property values have dropped because of the wind turbines that dotted the fields on three sides of his place.

"If it was me, I wouldn't buy it either," he said. "I guess I'm going to stay here quite a while."

The project manager for the Red Pine wind turbine project in Lincoln County vows her company will work with area residents to deal with any possible issues that may come up.

"As a company with more than 30 years of experience, we know the value that robust due diligence, preparatory analysis and siting research can provide to the community who will live in our project area," Shanelle Montana said. "As an integrated developer, owner and operator since 1985, this is something we do not take lightly. Should an issue arise during operations that affects a farming operations or household, we will work through every issue to identify a reasonable solution."

Janes' friend, Jim Ekholm of the Lake Cochrane area, is a opponent of wind farms and claims to have studied the their negative effects on neighbors. He claims that taxpayers end up paying for wind power twice. Government subsidies help pay farmers for the land on which wind towers are built, he said.

"The companies making money are using foreign materials and sending their profits off shore," Ekholm said. "The Bloomington subdivision is from London, England. The power they generate cannot sell to electric companies without a government subsidy. The subsidies will go away in 10 years after they start."

But Montana disputes that allegation. She said that the majority of wind turbine components and manufacturing is in the U.S. She said there are more than 20 companies manufacturing wind turbine components just right here in Minnesota.

Ekholm said he's all for clean energy, but wind power isn't reliable because the wind doesn't blow all the time, only about 35 to 40 percent of the time by Lake Cochrane, and that is the highest in the area, he said.

The other problem with wind towers is the human factor, Ekholm said.

"They're very noisy. And, shadow flicker is extremely irritating. It gets into your mind," he said.

Additionally, companies like to compare their wind turbines to the 40-foot windmills our grandparents had, but these are over four times that, Ekholm said.

Special roads have to be plowed and accessible year round, he said. Then the roads have to be removed when the turbines are no longer in use.

"Wind companies try to tell residents we don't have to worry about land restorations, but they should," he said.

Ekholm also said wind energy companies tried to set up in Lake Cochrane, South Dakota, but residents around the lake are against it. They fear that the change in the quality of recreational life wouldn't be worth it.

"Our laws are lax," Ekholm said. *"You'll still hear the turbines a mile away, not just if a bearing is out. That's something we shouldn't have to live with."*

Ekholm said that every wind tower has to have a backup coal or hydroelectric plant because the wind lets up and/or the energy fades over great distances.

The 3.5 megawatts from wind turbines sounds like a lot, he said, but it's not 24/7 (constant).

"Why are we dumping money into something that can't run without subsidies?" Ekholm said. "It's a fact that you'll never see your taxes go down because of wind towers. The energy companies want townspeople to vote for it. Townspeople won't have a problem with it because they won't be living near the turbines) and will only see the money that will be coming back to them."

Montana agrees wind does have a production tax credit from the federal government. But she said this credit is being phased out starting in 2020.

"Like every energy industry in the U.S. including gas and coal, the federal government has helped to spur innovation and domestic production," Montana said. *"Wind is now cost competitive. Many times beating out coal and natural gas."*

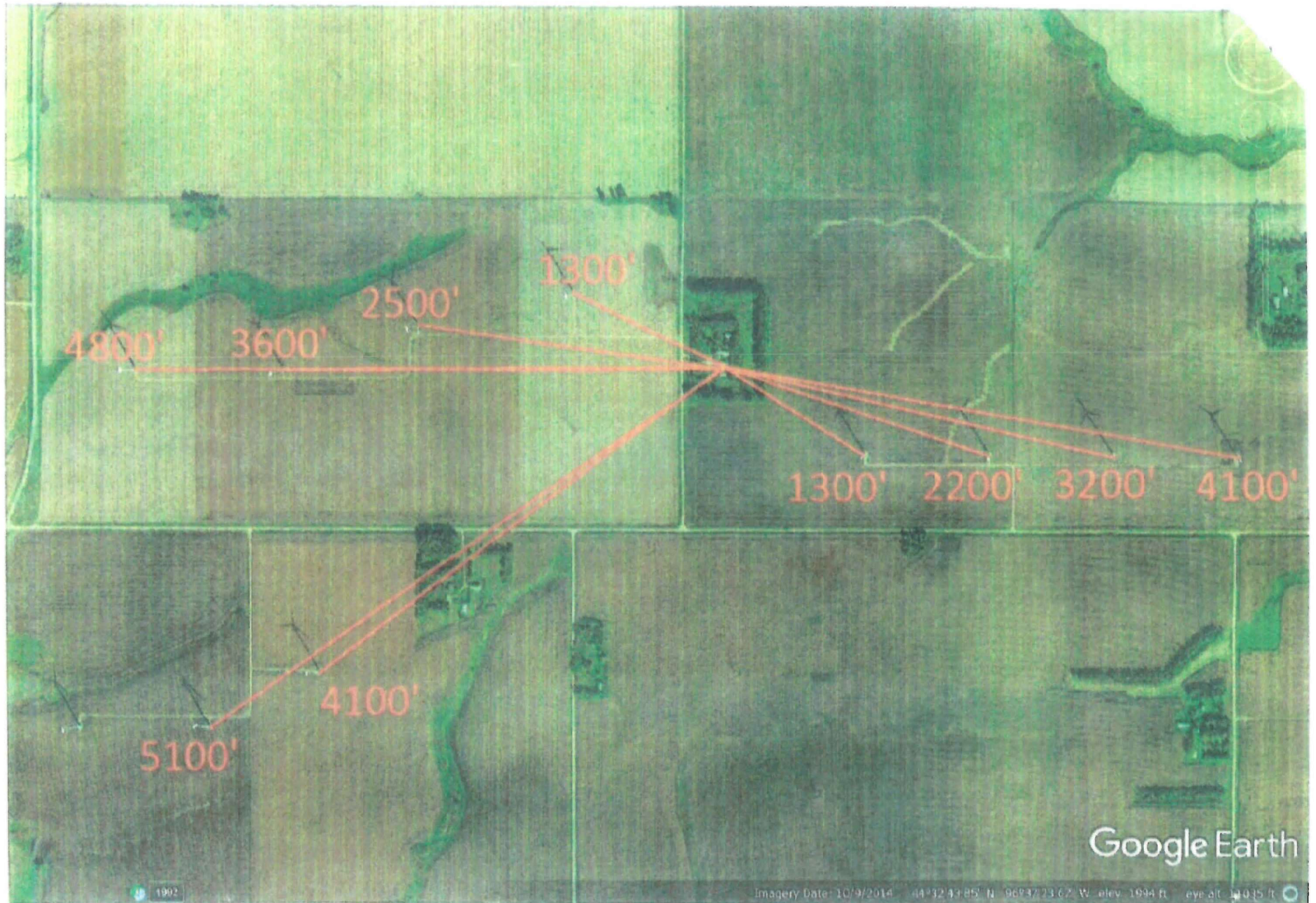
Montana cited a recent interview of Xcel Energy's CEO Ben Fowke by UtilityDive

"By 2021, the utility expects wind will be its largest energy source — not in terms of capacity, but actual generation," Fowke was quoted in the article.

"What's even more amazing is the prices. We're looking at (prices)in the low teens to low 20s (in dollars/MWh) — not starting prices, but levelized across the 25-year life of the project."

"That beats gas, even at today's prices," he said. *"I like to say we backed up the truck because the fuel of tomorrow was on sale today."*

David Jones Property



Toronto Area Interviews

The purpose of these interviews is to investigate how residents are reacting to living next to the wind turbines south of Toronto in Deuel County.

There are 24 existing wind turbines in Deuel County according to 2015 satellite imagery. Interviews were conducted with residents who live within 1 mile of the existing wind turbines.

According to 2015 satellite imagery, 17 Deuel County residences were counted within 1 mile of the existing wind turbines.

15 interviews were conducted as shown on the following pages. 13 of the interviews were with Deuel County residents. The 2 interviews in Brooking County were with residents who live just south of the Deuel-Brookings county line road.

The number of wind turbines within a mile of each residence is shown on each interview. Distances listed were measured off satellite imagery from the center of the house to the center of the wind turbine. All distances were rounded to the nearest 100 feet. The distances are also shown in miles for informational purposes.

Residents were simply asked what it was like living next to the wind turbines. If a resident voluntarily shared concerns about noise or shadow flicker, some follow up questions regarding the level of noise and frequency of shadow flicker were asked. All interviews were conducted in person (by Mark Junker) at the residence.

Also noted on each interview is any other relevant information that was volunteered. All interviews were ended with a question regarding if the owner was receiving any compensation from the wind developer.

Conclusion:

Although not scientific, there is nothing unique about the residents that were interviewed. Therefore, the sample of people interviewed is representative of the Toronto – White area wind development. All interviews conducted (both negative and positive) are contained within this report.

There is a wide range of reactions from residents living next to the wind turbines.

There is sufficient evidence from the interviews to demonstrate that a substantial number of Deuel County residents are negatively impacted from noise and shadow flicker generated from wind turbines.

Therefore, the current Deuel County ordinance does not protect a substantial number of residents from noise and shadow flicker generated from wind turbines.



District 225

ARMSTRONG TOWNSHIP HIGH SCHOOL

William Mulvaney, Superintendent
Darren Loschen, Principal

30474 Smith St.
P.O. Box 37
Armstrong, IL 61812
School: (217) 569-2122
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Dear Chairman Weinard,

My name is Bill Mulvaney and I am the Superintendent of Schools for Armstrong Township High School and Armstrong-Ellis CUD #61. I also served on the wind panel that met to try and give direction to the county board on wind turbine ordinances. Our panel did not come up with any recommended changes, but I would like to share a few thoughts with you.

I have noticed that we have some children in our district that appear to be having some medical issues related to the wind turbines. Headaches, lack of sleep and jaw issues seem to be the most common. The students also complain about not being able to sleep or not getting a full night's sleep due to sound issues.

We have also been advised that we will be losing a couple of families because the wind turbines were placed close to homes and the families can no longer handle the flicker and noise issues.

While these issues were brought up at our panel discussions, I was not fully aware of the impact that the wind turbines would have to my school districts. It is never a good thing when children have health issues or families have to leave their homes to get away from the turbines. The revenue generated by the turbines is a blessing to our schools, but the unintended consequences are real.

I hope this letter sheds some light on real issues that affect districts that house wind farms. I also hope that when ordinances are discussed in the future, that these issues are considered.

Sincerely,

A handwritten signature in black ink, appearing to read "William C. Mulvaney".

William C. Mulvaney
Superintendent
Armstrong Schools

NOISE: A startling case of two schools in proximity to wind turbines

Dear Mme Héroux,

I should be grateful if you would ensure that this report reaches the ladies and gentlemen of the panel reviewing the WHO's noise guidelines for Europe.

In an effort to assist a society in danger, I feel obligated to make this case public. I am employed in schools within a rural area. The projects I am involved in run throughout the school year. I hope it will be understood why I cannot reveal names and locations. Sadly, I must protect myself against the professional consequences which could result from a fully detailed testimony.

*During the past two years, I have worked in a school located **5 km to the east** of a small wind farm, whose elevation is about 300 feet above that of the establishment. Most of the time, the school is **downwind** from the 2 MW wind turbines. In 2014/2015, I worked with the kindergarten consisting of 20 children aged 2.5 to 5 years of age. I've been engaged in this work for a long time, and I know the region and its people very well.*

I was surprised how hard it was to manage this class of very young children. Actually, the teacher would systematically divide the class into two groups of 10, although I usually have no problems working with whole classes. Nonetheless, I found it hard to maintain the concentration of many of these children. In addition, a lot of pupils exhibited unusual and completely improper behaviour, which was violent and disruptive. I had rarely encountered this before with children of that age group, and never in such proportions. I did not understand why at first. It wasn't the teacher's fault: he was kind and rigorous at the same time, which is perfect for such small children.

During the second school year, I was again assigned to that school, but this time in two classes: the kindergarten divided into two groups, and a class with children aged 6 to 7.

*This second class was absolutely unmanageable during the five first sessions. Its experienced teacher commented to me it was like that most of the time, he just could not handle those children. Yet again, nothing was wrong with the teacher. Several children seemed to be extremely ill at ease, a feeling shared by the teacher. **There were instances of fits, outbursts of rage, rolling on the floor, knocking tables over and provoking each other into violent behaviour.** The teacher was losing confidence and was also beginning to feel ill himself, on one occasion coming very close to a burn-out. The tiredness etched upon his face reflected his struggles. It should be noted that he also had problems with his memory, and it was becoming obvious that the children's behaviour was not the only cause of his troubles, but that the location as well was a highly plausible culprit.*

I soon made the connection with the wind turbines, because this behaviour reminded me of two children I had worked with a couple of years ago: they lived 800 yards from a wind farm. Having realised that, I started to check on the wind direction every time I drove to the school, when passing the wind turbines which in any event can be seen from the village.

*From the start of the 6th session the change was dramatic: this class was the most peaceful I had ever taught. The children were remarkably calm and took part in the experiments in a very constructive way, intervening advisedly, all without pushing and shoving or fighting. Notably, the wind was blowing from the east, **from the village to the wind farm**, not the other way around as it did previously. I informed the teacher about my observation.*

Some time later, having worked during the morning in the kindergarten, I was having lunch with the teacher in the classroom before going to another school. At noon, he was called by his third colleague. The 6-7 year olds' teacher had left the school in tears, after a horrible morning spent with his pupils who had behaved particularly violently and unbearably. While we were eating, we stopped talking for a moment. This is when I felt the school vibrating, as if a lorry were passing on the country road 300 feet away. This vibration however, did not cease. In fact, the whole school was vibrating strongly, and we listened to that humming sound for a long moment. We opened the window, but there was no noticeable source of noise outside. It wasn't the air extraction fan either, for we could hear its less obtrusive noise separately.

The classrooms had probably been vibrating during the whole morning, but this had been covered by the background noise of our activities. There is therefore very good reason to believe that this could have been the cause of the particularly strong malaise felt in the disruptive class of 6-7 year olds during the morning. That particular room faces the wind turbines and clearly acts as a sound box. The two other classrooms are more protected, but that didn't prevent us from hearing strong vibrations in the kindergarten room, situated at the back of the building. The teacher of that class had also heard the noise very well. It is important to note that a sustained wind had been blowing **from the direction of the wind turbines** for several days.

The children all live in villages situated below the wind turbines, and were born after the construction of the wind farm. I recently met the mother of one of the children. She told me about the problems caused by the highly excitable nature of her two children and their classmates. She didn't know what to do, so she had called a woman who claimed to be able to 'demagnetise' her children. She also had special EMF electricity outlets installed. When I told her about my observations, her face immediately lit up and her comment was: « it's quite possible ! »

I had worked previously in the same school, in the same conditions and within its ancient building before the turbines were built. I retain happy memories of these times.

I have also worked, twice, in **another school**, located **2 km west from a similar wind farm**. First it was before the wind project was built, and I had found the children to be quick-witted, with many brilliant pupils among them, one being even recognised as exceptionally gifted. The second time around, it happened 4 and 5 years after the erection of the turbines. This was a part-time job which lasted 18 months, with 8-10 year olds.

When I took that assignment, I found that **a very large proportion of the pupils had special education needs, a large number of them bound to low attainment, and many had learning disabilities officially recognised (dyslexia, dyscalculia, dyspraxia etc.)**. Out of a class of 25 pupils, not a single one was considered brilliant. The same problems could be found in the second class, again with no children obtaining high grades. Given the high pedagogical quality of the teachers (they were the same as before the wind turbines), the eventual social problems of some of the children (not more than anywhere else) couldn't justify the massive failure in this primary level schooling.

I thought this failure might have been caused by EMF pollution from permanent WIFI signals, and the faint natural light in the classes. But it was the same as years ago, and the same in other schools, where I had met numerous brilliant children. **Again, the only difference here was the wind farm's proximity.**

Unlike the first school, and considering the prevailing westerly winds, this one was located **upwind** from the turbines, and at the same altitude. The children here didn't exhibit the same violent temperaments and behaviour as those described earlier in the first case, or as the two children living 800 yards from wind turbines. On the contrary, this was a very peaceful class, almost lifeless, lacking in concentration,

vitality and reactivity, with poor oral participation. A large proportion of children exhibited serious learning difficulties. In addition, when working in that school **I became dizzy** whenever rising from my desk, or when leaning over a child and straightening up. Here again, I thought the WI-FI was the cause (in fact it could have contributed some).

Comparing the two schools, the first one is located **downwind** about 300 feet below and 5 km away from wind turbines, with pupils born after these were erected, living in homes in much the same topographical situation as the school. **They exhibit severe behaviour outbursts when the wind blows from the direction of the turbines.**

In the second case we have a school located **upwind**, 2 km from another wind farm and at roughly the same elevation as its turbines, with pupils born before the construction of the wind farm, living in the same village as the school. **A high proportion of them have severe learning difficulties which didn't exist in that school before the wind turbines.**

As the inquiry is about ambient noise, generally speaking, I also wish to report the harm done by air extraction fans and milking robots, which have invaded our farms. Contrary to the earlier milking machines, they don't only work 2 x 2 hours a day, but keep humming around the clock, causing health problems to cattle and humans alike. This is not counting with the heat pumps. Actually, sources of infrasound are springing up everywhere. And although out of topic, please allow me to briefly mention the digital boards, the operation of which requires teachers to close the blinds, thus depriving a whole generation of children of natural light for a large proportion of their school day. In short, in an increasing number of schools, all these negative impacts on health add up. **But clearly, from my experience as summarised above, wind turbines are responsible for the most harmful impacts.**

I hope my testimony will enable you to write directives that will protect our children from these most harmful effects. I did not sign it, because too many "politically-incorrect" whistle-blowers have lost their jobs, which is something, you will appreciate, myself and my family cannot possibly risk or afford. Only authorised persons in very senior positions know my identity. **This report is, therefore, only anonymous with regard to its release into the public domain.**

I should be grateful for confirmation of receipt of this letter.

Sincerely

Signature: identity legitimately withheld (see last paragraph above)

Letter posted online Dec.13.16: <https://wefn.org/2016/12/13/windfarms-affect-children>

Sensing but Not Hearing: The Problem of Wind Turbine Noise (Interview with acoustician Steven Cooper, AU)

 masterresource.org/windpower-health-effects/sensing-not-hearing-problem-wind-turbine-noise-interview-acoustician-steven-cooper-au

February 2, 2018

Editor Note: Steven Cooper has advanced our understanding of how people react to real recorded pressure pulsations from industrial wind turbines. In the last six months he has presented eight papers at Acoustic Meetings in Zurich, Boston and New Orleans. With this interview, he breaks down some of the salient points of his research discoveries. Cooper's work is expanding our knowledge about "soundscapes" near projects, which could result in new legal requirements for manufacturers and developers.

"In general, wind farm applications claim that turbines do not generate any low-frequency, tonal, or impulsive characteristics, which is a matter disputed by residential receivers. The consequence of the pulsating signal generated by turbines (whether audible or inaudible) could potentially require a further adjustment to any perception or impact generated by wind turbines."

"On discussing the resident's observations (with the residents) for the first two weeks I found the use of describing the impacts in terms of **Noise, Vibration, and Sensation** was accepted by the residents as a better concept."

Stephen Cooper (below)

Q. Paul Gipe back in his 1995 treatise (*Wind Power Comes of Age*, pp. 371-73): stated, "Next to aesthetic impact, no aspect of wind energy creates more alarm or more debate than noise." He explained in his book how "all wind turbines create unwanted sound" and that sound can carry for great distances. Given this, why, twenty years later, is noise pollution and health effects therein just entering the mainstream?

Cooper:

First, some background. Sound is all around us unless we are in a vacuum. Noise is defined as unwanted sound and has been used as a descriptor by acousticians and authorities for more than 50 years.

'Noise pollution' could be taken as the concept of considering noise overall as being evident and affecting people to various extents with the concept of noise pollution being expressed in the late 1980s possibly more as a side issue to the common concept of air pollution.

Excessive noise or sound that may impact upon a person's health has been well-known for 60-plus years via occupational noise with relevant standards being issued for noise levels in a workplace environment.

With new investigation, the noise criteria applicable to occupational noise has been modified for general factory-type noise and then expanded for different type noises that do not accord with general everyday noise and result in different impacts on people's hearing, i.e. impulsive noise associated with hammering of steel, explosions, or firing of rifles.

In relation to general noise pollution (in terms of mainstream noise), the issue of health effects associated with road traffic noise, rail-traffic noise and aircraft noise entered mainstream issues before the 1995 extract that you have quoted. The general concept in terms of ascertaining appropriate **noise limits** for those types of noise involve community surveys and socio-acoustic studies to derive a dose-response curve where a noise limit was set to ensure that 90% of the population was not subject to an excessive degree of noise (with respect to annoyance) for 90% of the time.

With respect to wind turbine noise, in the mid-1990s the provision of wind turbines in rural communities came to the fore with respect to unwanted noise. Clearly the noise generated by such turbines was totally different to that of the existing environment. Whilst persons in proximity to wind turbines identified annoyance and sleep disturbance in mainstream acoustics, the number of people so affected is a small proportion of the total population and therefore did not warrant socio-acoustic studies.

If in the general sense the impact of turbines is limited to a small area around a wind farm (when compared with the total area of a regional county or the state) then the environmental authorities do not consider it to be a significant issue warranting further investigation.

Material conducted in relation to community response to wind turbines in Sweden and the Netherlands identified a dose-response curve significantly lower than that for road, rail or aircraft noise and suggested the appropriate limits for wind turbine should be significantly lower. However, that work related to relatively small turbines and an increase in the capacity of turbines to those which exist today results in a greater level of noise emitted from turbines.

Environmental authorities, encouraged by the wind industry, utilize noise criteria for turbines based upon road-traffic noise, notwithstanding the two noises are not the same.

The WHO 2009 European night-time noise guidelines identifies that ongoing noise disturbance, particularly with respect to sleep disturbance can lead to health impacts. It is necessary to note that most of the noise data contained in the 2009 guidelines relates to road traffic noise in urban areas. There is no data contained in the study related to wind turbines.

The various WHO guidelines that have been published identify where a noise contains a dominant low-frequency component then a further penalty should be added to any assessment criteria. Similarly, if a noise contains an impulsive characteristic then a further penalty should apply.

In general, wind farm applications claim that turbines do not generate any low-frequency, tonal, or impulsive characteristics, which is a matter disputed by residential receivers.

The consequence of the pulsating signal generated by turbines (whether audible or inaudible) could potentially require a further adjustment to any perception or impact generated by wind turbines.

In general, the noise criteria specified for wind turbine facilities is related to external noise levels, not internal noise levels. The spectrum of wind turbine noise can often be masked by external noise sources at an external location. But when assessed inside the dwelling, the reduction in sound provided by the building envelope dramatically reduces the high frequency components of both the external noise and the wind turbine noise, leading to a totally different spectral balance of the sound inside the dwelling that can make the audible characteristics of such turbines more apparent.

Q. How long have you been researching noise, vibration, sound, ILFN (Infra and Low Frequency Noise), and now, pressure pulsations, from industrial wind? How did you become interested in this?

A. I have been an acoustic engineer for 39 years and had a basic grounding in large scale industrial plants then helicopter and aircraft noise. I am involved in development applications for different types of projects and provided expert evidence on acoustic matters, primarily before planning courts.

In 2012, I was asked to review a proposed wind farm application and found a lack of evidence for the basis of the acoustic criteria that was proposed. The level of disturbance reported by residents in proximity to existing wind farms contradicted the acoustic material supporting the application.

Based on previous investigations of noise complaints one needs to take on board complaints in the investigation. This led to me requesting access to several residences in proximity to an operational wind farm. My attendance and measurements found the presence of noise levels significantly greater than predicted and a unique signature subsequently found near other wind farms.

Since 2012 I have been involved in seeking to identify and quantify the acoustic signature associated with wind turbines so as to permit the necessary medical investigations to be undertaken by others.

Q. Your interviews and studies at homes of impacted persons at Cape Bridgewater are groundbreaking. Can you describe the creative process involved in your discoveries? In what way was this study/research so important?

A. On previous testing at the Waterloo wind farm I found residents could identify pulsations from the wind farm even though it could not be heard. It was something they felt rather than heard. The wind farm could be sensed when the narrow band frequencies around 4 – 5 Hz had a level in the order of 50 dB (or more).

I was subsequently approached by the operator of the Cape Bridgewater wind farm to undertake an investigation to address complaints from local residents that could not be resolved by the dBA method and was given a free hand to undertake testing to explore the concepts I had presented to describe wind turbine noise impacts.

I was given a brief to undertake measurements and determine certain wind speed and noise levels that corresponded to complaints from specific local residents. The conduct of medical studies at the same time and have a control group was refused by the wind farm operator.

I based the study on the complaints and observations by the residents for comparison with the measurement results. I took the view that the primary function was to take account of the resident's observations without ANY preconceived opinions.

I took measurements inside and outside residential dwellings and was given access to the wind farm and all operating data over a 9-week period.

I was to attend the site every two weeks to download data and meet with the residents (a house at a time) to discuss the analysis of the previous fortnight and what they had reported. We processed the diaries and the data separately to each other, then combined the results for discussion.

I trialed a diary format based upon the EPA Waterloo study to see if I could match the results. But the residents couldn't agree with the noise descriptions.

On discussing the resident's observations (with the residents) for the first two weeks I found the use of describing the impacts in terms of **Noise, Vibration, and Sensation** was accepted by the residents as a better concept.

The challenge we had was finding a way to identify a pattern in the complaints versus the operation of the wind farm. I work best in a visual format and we tried various permutations of graphical tracking of the results versus the dBA levels, the power outputs of the wind farm and the wind speed and direction.

Initially I found a pattern versus changes in the wind farm power output as the residents were only reporting changes that they perceived. I changed the reporting to 1 or 2 hourly intervals.

Based on the complaints we found certain wind speeds (power outputs) that gave rise to complaints. The challenge was then finding the sound levels that related to complaints.

dBA doesn't work. We found it correlated well with the wind speed but not with the noise from the wind farm.

We then tried 1/3 octave bands and various acoustic parameters that have been used for noise and wind farm investigations and still no trend.

It was not until we tried the complaints versus the infrasound narrow band signature that we found a trend. *And sensation came out as the major impact.*

We tried plotting the greatest level of sensation (when the residents actually left their properties or wanted to leave) and found patterns of disturbance that related to the power output of the turbines trying to start, when at high wind settings that the blades were angled to depower the turbine or changes in the power output (up or down) of over 10%.

I also noted intermittent vibrations in the floor of house 88, even during the shutdown period, that related to wind gusts. This led to vibration measurements on some turbines and in the ground on the wind farm and the residences. We have since used the Cape Bridgewater data for further testing and research.

Q. How did you convince the developers at Cape Bridgewater to turn off the turbines for your control/blind study?

A. They were trying to get the testing done before or after the planned shutdown. The shutdown was to facilitate high voltage cabling at the substation and would occur on ten days with the wind farm operating at night. I convinced them that having testing during the shutdown would be an essential part of satisfying the brief as we could see if there were complaints without the wind turbines – and get the true ambient background noise levels without any power to the turbines.

It became an essential part of the study in that it clearly showed the different acoustic signature with and without the turbines operating, that the natural environment did not have a discrete infrasound signature and that wind gusts did excite resonances of the turbines, both in terms of noise and ground vibration.

Q. What recent papers have you presented, where, and about what? We understand that you are changing the language around “noise” and wind turbine effects possibly with the eventual understanding for legislators and policy makers.

A. The Cape Bridgewater study revealed further investigations were required as the scope of the study was limited by the wind farm operator and as such was called a pilot study.

I was invited by Dr. Paul Schomer to be a member of the Acoustical Society of America Wind Turbine Working Group to discuss further investigations of wind turbine noise. The group has had sessions at the last six ASA meetings with the opportunity to present papers on the topic. I have now given 14 presentations on my on-going research into wind turbine noise.

On the technical side we have developed a graphical presentation (a movie) for showing the variation in the acoustical signature that conveys a number of concepts in the time and frequency variations of the signal. I have raised the issue of sample speed and the error in using a digital simulation rather than the original wave file recordings.

Using a digital equivalent of a time average narrow band analysis of a wind turbine signal is not the same as the original signal. Whilst having the same energy content if used for subjective testing, it is dramatically dissimilar as identified in Annex D of ANSI Standard S12.9-2016/Part 7; but this seems to be conveniently ignored by some people.

Using inaudible digitized energy equivalent signals restricted to just infrasound can only give rise to a conclusion of nothing being heard/detected. Or, using an inaudible single tone at 4 or 9 Hz and saying it is wind turbine infrasound, is completely wrong.

We modified our reverberation chamber to investigate the threshold of perception versus the threshold of hearing in the infrasound region. Headphones don't work the same as immersing the body to the sound field. We investigated the reproduction of the wind turbine signals normal sound and infrasound in our chamber with a large baffle of speakers to find the limits of reproducing the signal.

This is where the issue of sensation comes into play. If the residents cannot hear the turbines yet they can sense them, then the Leventhall mantra of "what you can't hear cannot hurt you." is incorrect.

As in many cases residents can perceive the operation of the turbines even though they cannot hear them, we first worked on the threshold of perception of infrasound versus the threshold of hearing in one of our test chambers. The perception occurs below the threshold of hearing and has a hysteresis effect in that the thresholds are different when the levels is increased (from inaudibility) compared to going down.

I have questioned what makes up the acoustic signature or the mechanism that gives the infrasound signature. The accuracy of the analysis and whether the turbines generate infrasound and sound waves (like that of a tuning fork), or whether there was a pulsation of the sound occurring at an infrasound rate based upon the blade passing frequency. This is the number of times a blade passes a fixed point (say the tower). For a three-bladed turbine operating at 17 rpm this gives $3 \times 17 = 51$ times a minute or $51/60 = 0.85$ Hz.

There have been a series of papers on that subject and the ability to accurately reproduce the signal in a laboratory.

We have found there are issues with the mathematics of the analysis as the signals are not sine waves, but pulses that vary in their level over time due to different loadings on the turbines and interaction of multiple turbines.

We have identified several researchers who have used digitized infrasound signals, claiming that they are actual wind turbine infrasound, to lead to the conclusion of a nocebo effect. We have tried that approach and when increasing the gain to be audible and/or speeding up the signals into the audio range they sound totally different. Why not use the recorded wave files? Why go through a process of converting the signal into a modified digital signal that is not the same?

We looked at the subjective evaluation of wind turbine noise and the issue of amplitude modulation. We found audible and inaudible modulation and that the use of stereo imaging to give (in all cases) an overwhelming preference by the test subjects when compared to a mono signal. This outcome is obvious if you go and listen to wind turbines. However, there are

papers on wind turbine subjective assessment based upon mono signals. The papers presented over the last 12 months have focused on those issues and the accuracy of reproducing the test signal from wave files recorded on site.

The question of the perception of inaudible wind turbine noise was investigated for the first paper given in New Orleans last month. It seems nobody else has undertaken such an exercise and we were able to show that persons sensitized to wind turbine noise could identify the operation of the test signal even though it was completely inaudible.

Q. The “sensing but not hearing” may be oblique to some. Can you explain the process and effects on the whole person, from the unique pressure pulsing of industrial wind turbines?

A. In 2013, monitoring at the Waterloo wind farm at a number of different houses found that residents could identify the operation of the turbines at certain times and not at others. I was unable to hear the turbines, but by viewing the narrowband frequency spectrum covering the infrasound region the analyzer showed discrete frequencies associated with the blade pass frequency (the number of times a turbine blade would pass a fixed position in a second) and multiple harmonics of that frequency.

I observed that when the levels of the frequencies around 4 to 5 Hz exceeded 50 dB then there was a very good correlation with the perception of the operation of the turbines. However, such levels of noise at those frequencies are deemed to be inaudible.

What I asked residents to do, whilst I was undertaking measurements, was to simply use their hand to identify the pulsations that they could detect such that the hand moved in time with those pulsations.

This led to the concept of sensation and by communication with colleagues in America as to the limits where the perception of the operation the turbines occurred led to the rediscovery of the work in 1980 by Dr Kelley.

When I tried the diary concept for the Cape Bridgewater residents I utilized the South Australian EPA's diary format from the Waterloo study to find that the residents did not fully comprehend or agree with the diary because the descriptions associated with noise were not necessarily satisfying what the residents were detecting. I then suggested the concept of something that they sensed rather than heard or felt by tactile vibration as another descriptor that could be used. This sensing involved pressure in the head, in the throat, in the chest, feeling dizzy, feeling lightheaded, a tingling in the legs, **whatever sensation they experienced which could not be explained by something that they were hearing or a vibration that they were feeling.**

(Our note: See here for a previous article at MR regarding the Cape Bridgewater findings.)

All the residents involved in the Cape Bridgewater study agreed that the concept of sensation was more appropriate in describing what they were experiencing, and that in many cases what they had complained about as noise impacts was incorrect and was the wrong description.

When describing the concept of sensation to other people that are exposed to wind turbine noise I have received confirmation that, yes, sensation is the appropriate mechanism for describing what they are experiencing.

As described earlier, the operation of a turbine generates pulses at the blade pass frequency. Due to there being different wind speeds at different elevations above the ground then the pressure differential across a blade at the top of the swept path is different to that at the bottom. Accordingly, along the length of the blade one can imagine the windspeed and the pressure differential across the entire length of the blade will vary as the blade rotates.

For example, for a three-bladed turbine that is operating at 17 revolutions per minute, then for any fixed point on the circumference of the swept path of the blades there will be $3 \times 17 = 51$ passes per minute. Because acousticians work in Hertz or cycles per second, then the blade pass frequency is $51/60 = 0.85$ Hz.

As frequency is the reciprocal of the timing between the pulses a blade pass frequency of 0.85 Hz means that there is a pulse every 1.177 seconds.

One only needs to listen to operational turbines to observe that the nature of the acoustic emissions generated by turbines is not one of a constant noise. One can hear the regular pattern of the swish noise which occurs at the blade pass frequency.

Spend some time at a turbine and it becomes apparent that the overall noise varies up-and-down in its level due to the different wind speeds. The character of the noise may vary in a matter of minutes due to a significant variation in the level of the noise (the amplitude) where that variation changes at the rate of the blade pass frequency.

If you examine the frequency spectrum you will find that the variations in the amplitude and the pulsations that occur affect all the frequencies across the audible range and occur below the nominal threshold of hearing which means that there are inaudible pulsating signals.

The natural environment where there are low frequency and infrasound signals generated by the wind, waves on the beach, waterfalls etc. do not exhibit this unique periodic function of a blade pass frequency, and harmonics of that frequency. This permits one to simply use the narrowband infrasound analysis to identify the operation of a turbine.

Many residents report unexplained disturbance or impacts when they are unable to hear the turbines but can identify the operation of the turbines by way of what they sense; that led me to undertake the latest research by creating inaudible wind turbine noise as recorded inside houses and then subjecting people to that noise.

As an acoustic engineer with years of investigating industrial noise complaints and complaints from the community concerning, in particular music from licensed premises, the important thing in considering impacts from any noise source is listening to the complaints, conducting measurements and observations with an open mind and then seeing if there is any relationship between those three inputs in addressing the problem.

That is the approach that I adopted in trying to understand what were the complaints from residents associated with wind turbines when on my first experience the noise was extremely low, could not be detected inside the dwelling and I didn't understand why the residents would be so vocal and genuinely distressed from the turbines.

Now I am summarizing in a relatively short space of time the result of four years of research work into what constitutes the acoustic signal from wind turbines and investigating the limitations in producing such signals. This work has been the subject of 14 presentations/papers presented to the Wind Turbine Working Group of the Acoustical Society of America. It has been a long and frustrating process to identify how to reproduce the original signal in a laboratory (and more importantly what doesn't work) that has questioned and debated what is the actual acoustic signature associated with turbines, and are we correctly measuring those signals?

Chapters 9 and 10 of the Cape Bridgewater report identified by way of the specific on-off testing of the entire wind farm the unique signature that is associated with wind turbines, and I understand that is the first time that multiple simultaneous measurements repeated on a number of occasions with turning off entirely a wind farm that this material has been obtained. A stopped wind turbine/wind farm generally still has equipment operating inside the turbines such as pumps and fans et cetera operating that in turn can radiate noise from the turbine tower and effect the "off" results, which was the case under the EPA Waterloo study.

Q. What triggers are there for sensitive or sensitized persons? Do you plan more research on specifics of these (possibly PTSD impacts)?

A. I am just a noise engineer and therefore not qualified to answer that question in terms of how the body responds to different acoustic stimuli.

What we have found is that we can present to people inaudible wind turbine noise and get a reaction whilst we can provide inaudible road traffic noise or wind noise similar levels or for that matter constant tones and not get any reaction.

We were investigating noise complaints associated with an underground coal mine that has a very large ventilation exhaust fan with an operating speed well down in the infrasound region and was subject to some level of pulsation. In an audible sense that a kilometer from the discharge point one could hear a low frequency noise around 120 Hz that over a very slow rate the amplitude of that noise would vary.

When the family that was the subject of the investigations attended our laboratory, and was exposed to a constant level and 120 Hz (pure tone) at about 50 dB there were no issues. That level of sound is clearly audible. However, when we sought to turn the volume control up and down on a repeated basis the residents noticed a difference. As we slowed the rate of turning the volume control up-and-down the sound became more disturbing, and when we attained a rate of about two seconds, the family felt very uncomfortable and left the test room.

This material was reported to the Wind Turbine Working Group at the Salt Lake meeting in May 2016 together with a movie concept that we had developed showing the variation in amplitude and frequency of the original source signal to have the acousticians immediately recognizing relationships to motion sickness.

Normally people look at the physical movement of the body in terms of vibration as to motion sickness but there was no physical movement of the body but simply a pressure wave to the body and the head which is one issue that raises the question of trigger that you have expressed.

In the Wind Turbine Working Group meeting in Hawaii in December 2016 I raise the issue of the **startle reflex**, and whether one needed to consider the holistic effect of noise vibration and tactile perception which could incorporate the entire body.

We found that residents in proximity of a coal-fired power station (15 – 30 km) experienced significant sleep disturbance when the power station was operating at low fire rates, in a run up or run down when they obtained about a 25% capacity, or if the two turbines when operating the maximum capacity had a difference of about 10 MW. Examination of the signatures during that time indicated that the 50 Hz mains frequency was subject to variation and an infrasound rate, pulsations.

It would seem that my work has shown that inaudible pulsating noise can create impacts. As such it would appear that I have provided some validation of a hypothesis provided by Dr. Nina Pierpont in 2009.

“Wind Turbine Syndrome, I propose, is mediated by the vestibular system—by disturbed sensory input to eyes, inner ears, and stretch and pressure receptors in a variety of body locations. These feed back neurologically onto a person’s sense of position and motion in space, which is in turn connected in multiple ways to brain functions as disparate as spatial memory and anxiety. Several lines of evidence suggest that the amplitude (power or intensity) of low frequency noise and vibration needed to create these effects may be even lower than the auditory threshold at the same low frequencies. Re-stating this, it appears that even low frequency noise or vibration too weak to hear can still stimulate the human vestibular system, opening the door for the symptoms I call Wind Turbine Syndrome.” Pierpont 2009

In 2012, from my initial analysis and investigations of complaints in relation to wind facilities, I was of the view that we needed to identify the acoustic signature associated with operational wind turbines, and only when that signature had been identified and able to be reproduced, could you then move to the next stage, which would allow the medical investigations into wind turbine noise.

The problem that existed in 2012 was that there be no medical studies to identify the impacts of wind turbine noise (a common statement from the wind industry). However, there is equally the same position that there are no medical studies to identify that there are no impacts from wind turbine noise.

On a statistical basis whilst adverse impacts attributed to wind turbines represent a small proportion of the community, the proportion of the community affected is more than a background proportion and indicates that there is a statistical anomaly that supports a problem.

For the people who are adversely affected by wind turbines to the extent that it affects their daily lives and in extreme cases causes them to abandon their homes, it is clearly a problem. If one restricts the catchment area for a community to be within 10 km of a wind farm (and not as in some studies, consider the community out to 100 km away), then on the restricted catchment area on a statistical basis there is a high proportion of the community being affected.

Where do we go from here? It seems we have a facility that can faithfully reproduce various acoustic signals across the audible frequency range and in a limited capacity we can reproduce infrasound levels in a test environment. We are presently exploring better quality digital to analog converters to overcome some technical limitations.

With our recent pilot study results if funding can be provided we would seek to rerun the study but with say 50 test subjects who are being sensitized to wind turbine noise but at the same time we would have appropriately qualified people undertake medical monitoring of the test subjects including EEG monitoring. We would not only just examine wind turbine noise, but we would compare the general environmental noise (also inaudible) that is often used as a comparison to wind turbine environments.

Q. Why are some persons near projects impacted, and others less so? Is it possible that some are impacted without knowing it long term? If so, what might those health impacts be?

A. In 2015 I presented a paper to the Wind Turbine Working Group of the Acoustical Society of America where I raised the matter of '**sensitization over time.**'

Over the last six years I have attended various wind farms on a number of occasions as part of my research work an investigation into wind turbine noise. I have met residents and have stayed at their houses several times over the years; it seems to me as a general observation that the people become more sensitized to the operation the turbines in that they are able to detect the operations at a lower level than previously, and that in the number of households more members of the household have been able to detect sensations or were being impacted by the turbines than on previous site visits.

The residents report a greater sleep disturbance over time and more people have had to abandon their homes.

For some people when abandoning their homes and residing at other locations there is an improvement in their overall demeanor and well-being and from my observations their conversation appears to be more normal and not exhibiting (to me) signs of depression.

However, for some people there are still lingering issues of impacts and the degree of sensitization that has developed has become affected by other "normal" noise sources such as traffic.

At the New Orleans Wind Turbine Working Group meeting Melissa Ware (who has a hearing impairment and was one of the participants in the Cape Bridgewater study) presented how she has been impacted because of the turbines.

Figure 4.3 of the WHO 2009 European night-time guidelines identifies how ongoing noise disturbance can lead to health impacts and cites cardiovascular disease as one possible outcome. The WHO discussion in Chapter 4 in relation to health impacts, primarily related to road traffic and aircraft noise, should be placed in the context of the suggested dose response curves to indicate impacts from wind turbine noise occurs at lower thresholds than that of Road Traffic or Aircraft Noise.

Q. You have testified in many instances, in various countries, about these findings, and the very real and verified impacts on "victims." Have these testimonies had impact on policy changes?

A. The wind industry relies upon compliance with guidelines or criteria issued by regulatory authorities.

In many cases the court relies upon guidelines or criteria issued by regulatory authorities, despite hearing evidence from residents as to the extent of disturbance they experience because of operating wind turbines.

In the end the court or tribunal uses the escape clause that it is not for them to set guidelines or criteria, but it is the regulatory authorities responsibility and therefore they must abide by that criteria.

So, to date there have been no policy changes as a result of my investigations or the many "victims'" impact statements to Courts and Tribunals. The escape clause is the published guidelines and standards.

When one examines the guidelines or standards used in Australia for wind turbines, it becomes obvious that there is no scientific basis to identify the noise targets proposed for wind farm facilities with respect to an acceptable level of noise that will not give rise to disturbance or unacceptable impacts for residents.

This fact is obvious because there are no scientific studies into determining the dose-response curve to identify the level of annoyance that would satisfy 90% of the population or to identify the level of noise from wind turbines that would not give rise to sleep disturbance.

The regulatory authorities are the ones who should be accountable to the community for permitting adverse impacts and in turn health impacts.

Policy change in terms of guidelines and standards for wind turbines in Australia, or in America, will simply not occur if left to the regulatory authorities. For example, the community of Waterloo in South Australia have publicly expressed no confidence in the South Australian EPA who steadfastly support their guidelines as being appropriate, without providing any material to support the basis of those guidelines other than simply referring to WHO guidelines (based upon road and air traffic).

With the mounting evidence of the negative impacts created by wind turbines, and if one can get to the point of the medical studies to confirm the actual impacts, then one could expect damages claims against the regulatory authorities for their lack of scientific rigor and failure to apply the precautionary principle.

In late last year, the Administrative Appeals Tribunal (a federal Judicial body) in relation to the charity status of the Waubra Foundation, was presented with a significant degree of evidence in relation to wind turbines creating adverse impacts on the community and the inadequacy of current guidelines to protect the community.

The Waubra Foundation has assisted members of the community in seeking to understand the ramifications of wind turbines and to be in effect the first point of contact to obtain information or advice in relation to wind turbines.

The foundation lost its charity status, but it is of huge significance that the Administrative Appeals Tribunal clearly stated that dBA was useless. *The AAT found that the operation of wind turbines did generate both audible and inaudible sound, did create an impact on the community that gave rise to disturbance and that more research (to that proposed and supported by the Waubra Foundation) should be undertaken.*

The week following the AAT decision, five papers from Australians were presented to the ASA Wind Turbine Working Group, of which the first paper was my recent one concerning the pilot study of inaudible wind turbine noise being detected by residents who are sensitized to wind turbine noise.

Q. In your response to the previous question you referred to the need for appropriate criteria for wind turbines and noted that there are '**no criteria** based upon wind turbine studies.' Some people say the Health Canada study provided that information. What is your view of that study?

A. I am unable to comment on the socio-acoustics or the medical components of the study, but understand there has been significant criticism of the Health Canada study by persons appropriately qualified in those areas. Master Resource has published some of those; other criticisms are listed here.

The authors of the Health Canada study identified that it was only site specific and should not be used as generic conclusions.

The study had limitations on the age of people involved in the study and left out houses that were vacant. Community representatives have identified that a high proportion of the vacant houses related to people who had left the area (abandoned their homes) because of the wind turbines.

The ASA Wind Turbine Working Group (Acoustical Society of America) was advised in the middle of last year that there would be an investigation undertaken by Health Canada in conjunction with the community to look at the people who are sensitized to wind turbines and/or who had abandoned their homes, but that material has not been published.

The determination of the actual noise from wind turbines when utilizing the dB(A) or the dB(C) parameter is difficult in the real-world environment, which is the position that we found in the Cape Bridgewater study.

A problem with the Health Canada study is the lack of actual acoustic or measurements to relate to the community response material in that the **study relied upon predicted noise levels** and not actual noise levels. As such the Health Canada study did not (and could not) provide any validation of the predicted levels versus the actual wind turbine noise levels.

The analysis to show a constant 15 dB difference between dB(A) and dB(C) is simply from a mathematical analysis of distance attenuation using a constant spectrum without any adjustment for excess attenuation over distance due to atmospheric absorption and this can only relate to a theoretical exercise for external noise. Due to the attenuation characteristics of different building envelopes, the internal noise level from wind turbines cannot be simply extrapolated from an external noise level, and this is an issue of concern.

The interpretation of annoyance excessive to background levels as published by the principal author of the Health Canada study, simply defies logic as to what it means and ends up contradicting other acoustic components of the study.

Some of the ambient noise levels that have been provided in the Health Canada study seem to be extraordinarily high if one is considering a rural environment. Yet there is no information to identify the nature of the acoustic environment and the influence of agricultural activities or traffic noise that may have required some of those data points to be removed.

The study appeared to be constructed around existing general acoustic criteria and other than some excellent work in terms of infrasound monitoring (then reported upon by others), there does not appear to have been an attempt to undertake a lateral thinking approach in looking at other indices or issues that may be giving rise to the reported disturbances.

Q. It seems that the primary complaint that first occurs with wind turbines is sleep disturbance. The WHO 2009 European Night Time Guidelines show in Figure 4.3 that on-going sleep disturbance becomes a health impact. The WHO reports that some of these, by no means the exhaustive list, are attributable to poor sleep patterns, often a result of environmental noise:

fatigue, lack of ability to concentrate, memory impairment, lack of energy, proneness to errors or accidents, tension, social or vocational dysfunction, headaches, and gastrointestinal symptoms related to worry about sleep.

In your opinion is sleep disturbance from wind turbines a relevant matter that should be investigated?

A. Most definitely YES.

If we have guidelines or standards that claim they have criteria to protect against sleep disturbance or identify the sleep disturbance is an adverse impact, or criteria that purport to protect the amenity of the surrounding community from adverse noise impacts then surely there must be some data to substantiate the criteria that have been nominated for wind turbines.

However, I have yet to see any material/data that relates to the current capacity of wind turbines being installed around the world. A few papers related to studies at the beginning of this century in Sweden and the Netherlands on relatively small wind turbines, indicated dose response curves significantly lower than that applicable to road traffic noise (in urban areas) or aircraft noise.

Wind turbines are generally located in rural areas then the acoustic environment of rural areas, and therefore the identification of the acoustic amenity that residents in those areas experience must be different to that in an urban environment.

From my investigations and examination of various studies into wind turbine noise, it seems to me that the following questions need to be answered by the Regulatory Authorities in relation to the criteria that those authorities have issued to permit wind turbines to operate in proximity to residential receivers. It does not hurt to repeat these, if some have not understood the basic nature of these requests for sources and studies.

1. Please provide studies upon which the wind turbine/farm criteria have been developed?
2. Please identify the noise source(s) that have been used in the studies related to question 1?
3. Please provide the dose-response data related to wind turbine/farms on which the criteria are based, and the corresponding level that represents 10% of the population that is highly affected?
4. The most common complaint from residents relates to sleep disturbance. Please provide the studies of wind farm noise that identifies the noise (in any relevant acoustic index) that gives rise to sleep disturbance?
5. Please provide studies of wind farm noise that identify the noise level (in any relevant acoustic index) that will not give rise to sleep disturbance.

6. Please provide studies of wind farm noise that identifies the noise level that would protect the acoustic amenity of residents in proximity to wind farms.
7. In light of the above, please identify who would be liable (in a damages claim) for the consequences of adverse impacts.

I came up with the above questions in December 2016 and to date, neither I nor community representatives in Australia have been able to get any response from the regulatory authorities or a Commonwealth Government appointed Wind Farm Commissioner to these relatively simple questions.

Those same questions were put to the Administrative Appeals Tribunal, but they were unable to answer those questions simply because the data is not available.

The provision of scientific data to identify the dose-response curve and sleep disturbance criteria in relation to wind turbine noise would then place in context the appropriateness or otherwise of criteria issued by Regulatory Authorities.

We thank Steven Cooper for his detailed and extremely current exploration and overview of wind turbine "noise" and again, his studied reminders of the profound relationship between sleep and health. As Mr. Cooper indicates yet again, let developers or wind promoters provide the dose response curve for sleep disturbance, provide all the data that should be tabled, in full protection of human health, before contemplating building wind factories.

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posted: November 12, 2014 • Health, Noise, Technology

Negative health impact of noise from industrial wind turbines: The evidence

Author: Punch, Jerry; and James, Richard

This post, the second of three installments, reviews the major research findings linking low-frequency noise and infrasound from industrial wind turbines with effects on health and quality of life.[1] [Part 1: Some Background; Part 3: How the Ear and Brain Process infrasound.]

Evidence that industrial wind turbines (IWTs) negatively impact human health is vast and growing. Although that evidence acknowledges that the exact exposures needed to impact health and the percentage of the affected population are still unknown, there is indisputable evidence that adverse health effects (AHEs) occur for a nontrivial percentage of exposed populations. Here, we give an overview of that evidence.[2]

Wind turbine noise is not known to cause hearing loss. Interestingly, though, individuals who have hearing disorders may be more susceptible than persons with normal hearing to AHEs from wind turbine noise, and people who are deaf can suffer the same ill effects as those who have normal hearing when exposed to wind turbine noise. The latter finding supports the view that infrasound, not just the audible whooshing, low-frequency noise emitted from wind turbines, is the cause of many of the health complaints.

The anecdotal evidence, documented on internet blogs, in newspaper articles, in expert testimony in legal proceedings, and recently in the documentary movies Windfall and Wind Rush, is compelling and illustrative of the similarity in symptoms. These adverse symptoms appear when people are exposed to operating wind turbines, and disappear when the turbines stop operating. These observations resemble single-subject research experiments, in which individuals serve as their own controls while being subjected to alternating conditions or treatments. Dr. Carl Phillips, noted epidemiologist, describes the use of adverse event reporting

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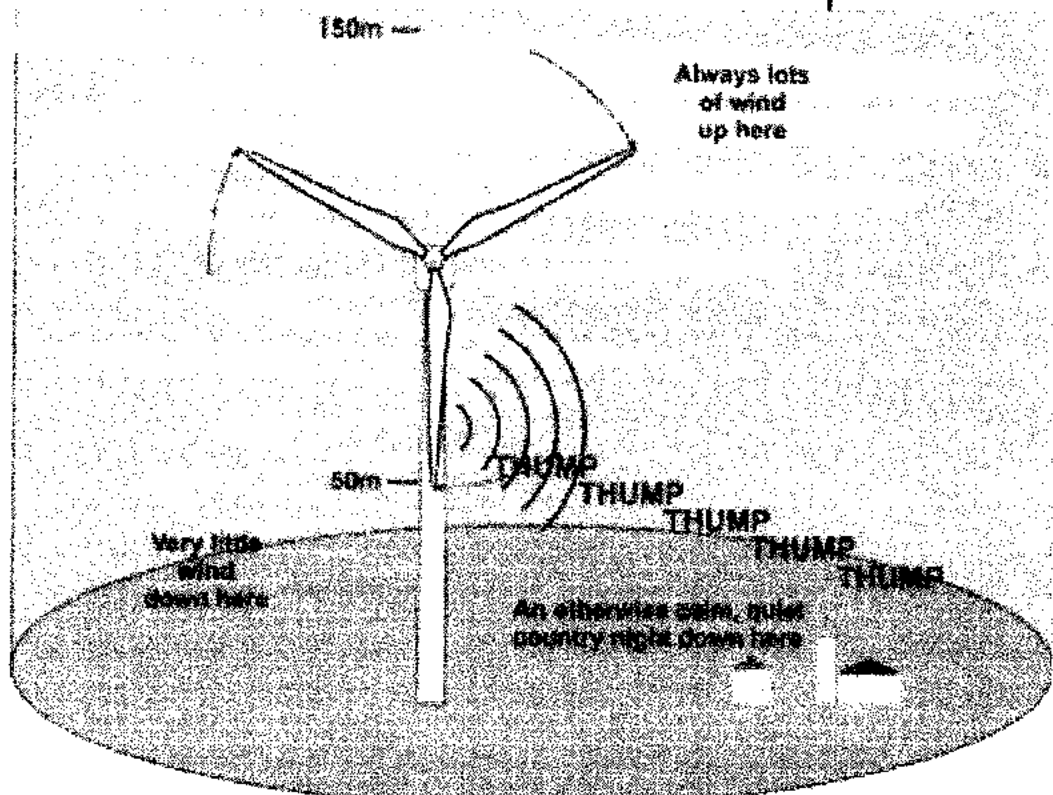
as a first step in establishing the existence, prevalence, and spread of a variety of health conditions, as well as adverse reactions to such agents as medications and environmental pollutants.

Reports that many families abandon their homes after IWTs begin operation make the anecdotal evidence particularly compelling.

Studies conducted in Denmark, the Netherlands, Germany, and Sweden, where residents have many decades of experience with IWTs, collectively indicate that wind turbine noise differs from and is more annoying than other sources of noise, including community, transportation, and industrial sources.

These differences are attributed to the substantial infrasound and low-frequency noise (ILFN) produced by the turbines. Such sounds are not easily masked by other environmental sounds, including wind noise.

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As the blade passes the tower, infrasound pulses are emitted, while more audible low-frequency sounds are produced by blade movement. Used by permission of Esther Wrightman, Ontario.

Annoyance from turbine noise at 35 dBA corresponds to the annoyance reported for other common community-noise

sources at 45 dBA. The World Health Organization (WHO) has concluded that observable effects of nighttime, outdoor noise levels of 40 dBA or higher will lead to diminished health. This also occurs when levels inside homes (especially bedrooms) rise above 30 dBA or contain non-steady and/or low-frequency noise.

Yet, the wind industry commonly promotes 50 dBA as an appropriate limit for homes, even though the World Health Organization has identified such high levels as a cause of serious health effects.[3]

HEALTH EFFECTS OF WIND TURBINE NOISE

By far, sleep disturbance is the most common complaint of families living near wind turbines. Prolonged lack of sleep affects our capacity to learn and negatively affects our memory, temperament, heart health, stress levels, and hormones that regulate growth, puberty and fertility. It can also lead to high blood pressure, changes in heart rate, and an increase in heart disease, as well as weight gain and lowered immunity to disease. These symptoms have regularly been reported by individuals who live near IWTs.

In a controlled clinical study, residents who lived within 1.4 kilometers, or 0.87 mile, of IWTs exhibited greater sleep disturbance and poorer mental health than those living at distances greater than 3.3 kilometers, or 2 miles, away, and scores on sleep and mental-health measures correlated well with noise exposure levels. Another study found lower quality of life (QoL) in residents living within 2 kilometers of a turbine installation than at longer distances. Abandonment of homes near wind turbines has been associated primarily with disruptions to sleep and QoL.

Nina Pierpont, MD, PhD,[4] and a practicing pediatrician, coined the term *Wind Turbine Syndrome* (WTS) in 2009 to describe the symptoms she observed in a cohort study of 38 members of 10 families. Those symptoms include: sleep disturbance; headache; Visceral Vibratory Vestibular Disturbance (VVVD); dizziness, vertigo, unsteadiness; tinnitus; ear pressure or pain; external auditory canal sensation; memory and concentration deficits; irritability and anger; and fatigue and loss of motivation. Although her case-series report, published as a book, has often been maligned by the wind industry as being non-scientific, an increasing body of scientific evidence supports her observations and their links to exposure to wind turbines. Dr. Robert McMurtry, a well-respected Ontario physician, recently

proposed specific diagnostic criteria for a case definition of AHEs due to IWTs.

INDUSTRY REACTS TO CLAIMS

In 2009, a joint report of the American and Canadian Wind Energy Associations (AWEA/CanWEA) established the basis for arguments routinely used by wind energy advocates to persuade the public and public officials that IWTs present no health risks. The panel members who produced the report were handpicked by AWEA's acoustical consultant, and all had prior positions on noise from wind turbines favorable to the industry.

The report concluded that exposure to wind turbine noise has no direct adverse physiological or health consequences, a conclusion shown to be erroneous by multiple lines of evidence, at least several of which were established prior to the report. The report's major weaknesses were its comparisons of wind turbine noise levels to those produced by other environmental noises and its embrace of the A-weighted measurement scale as valid, even though that scale minimizes low-frequency sound and completely excludes infrasound.

Several scholarly researchers have rejected the AWEA/CanWEA report as misleading and unscientific. One of the report's co-authors, Dr. Geoff Leventhall, whose own research demonstrates that ILFN leads to various health symptoms, attributes those symptoms to extreme psychological stress from low-frequency noise, but does not acknowledge that IWTs also cause such symptoms. He argues that the ILFN emitted by wind turbines falls below the threshold of hearing, claiming that what we can't hear can't hurt us—a topic we will address in our final installment.

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***Richard James** is an acoustical consultant with over 40 years of experience in industrial noise measurement and control. He is an adjunct instructor in Michigan State University's Department of Communicative Sciences and Disorders and an adjunct professor in Central Michigan University's Department of Communication Disorders.*

[1] Part 1: Some Background. Part 3: How the Ear and Brain Process Infrasound.

[2] Of note: the authors of this series are currently preparing a comprehensive, fully referenced paper for publication elsewhere.

[3] Night Noise Guidelines for Europe set limit at 40 dBA.

[4] MD degree earned from Johns Hopkins and PhD from Princeton.

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- Effects of industrial wind turbine noise on sleep and health
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specifying the event of self-insurance coverage hereunder. Any insurance coverage provided by Developer shall be for the benefit of Developer and Owner, as their respective interests may appear. After each fifteen (15) years of the Easement Term, Developer shall adjust the limit of required insurance, if necessary, to a commercially reasonable amount.

12.2 Requirements of Policies. The insurance required in this Section 12 shall be with an insurance company or companies authorized to do business in the State of South Dakota. All the insurance policies referred to in this Section 12 shall contain a provision that they cannot be cancelled without first giving Owner thirty (30) days' notice in writing of the company's intention to do so. If Developer does not pay the premiums thereon when due, Owner may procure and maintain insurance and any such premium plus interest at the Default Interest Rate shall be payable to Owner with the next payment due pursuant to Section 5.

13. Indemnity.

13.1 Indemnity by Developer. Developer shall defend, indemnify and hold Owner harmless from and against all loss, damages, liability and claims of liability, for damage to property or injury to persons resulting from the activities of Developer, its agents, contractors, employees, guests, invitees, licensees and permittees (collectively, "Developer's Agents") on or about Owner's Property, except to the extent that such liability or loss is due to any negligent acts of Owner or its agents, employees, contractors, guests, invitees, licensees and permittees (collectively, "Owner's Agents"). Owner hereby waives any claims against Developer for damage or injury directly suffered by Owner arising as a result of any audible or electromagnetic noise, electrical interference, radio frequency interference, vibration, visual impacts, flicker, shadows or weather-related effects or hazards attributable to Developer's Operations on Owner's Property; provided that nothing herein shall be deemed to release Developer from its obligation to indemnify and hold harmless Owner from third party claims under the first sentence of this Section 13.1.

13.2 Indemnity by Owner. Owner shall defend, indemnify and hold Developer harmless from and against all liability and claims of liability, for damage to property or injury to persons resulting from the activities of Owner and Owner's Agents on or about Owner's Property during the Easement Term; except to the extent that such liability or loss is due to any acts of Developer or Developer's Agents.

LIABILITY DOESN'T FALL ON INDIVIDUAL - LAND OWNER.

13.3 Hazardous Materials.

13.3.1 Owner shall not violate, and shall indemnify Developer for, from and against any claims, costs, damages, fees or penalties arising from a present or future violation by Owner or Owner's agents or contractors of, any federal, state or local law, ordinance, order, or regulation relating to the generation, manufacture, production, use, storage, release or threatened release, discharge, disposal, transportation or presence of any substance, material or waste which is now or hereafter classified as hazardous or toxic, or which is regulated under current or future federal, state or local laws or regulations, on or under Owner's Property.

13.3.2 Developer shall not violate, and shall indemnify Owner against, any claims, costs, damages, fees or penalties arising from a present or future violation by Developer or Developer's agents or contractors of any federal, state or local law, ordinance, order, or regulation

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EASEMENT

REDUCE VALUE 25% - 40%

This Easement for Wind Energy Development (this "Easement") is made and entered into as of _____, 20__ (the "Effective Date") by and between _____ ("Owner"), and Triple H Wind Project, LLC, a Delaware limited liability company ("Developer") in respect of Owner's Property (defined below). Owner and Developer are sometimes referred to herein individually as a "Party" and collectively as the "Parties."

By executing this Easement, Owner confirms that Owner did not execute this Easement until at least ten (10) business days after Developer first delivered this Easement to Owner, in accordance with the waiting period requirement in South Dakota Statutes Chapter 43, Section 13-20.4.

1. **Definitions.** Capitalized terms that are not otherwise defined in this agreement shall have the meanings assigned to them in this Section 1:

1.1 Day, as used in this Easement with respect to time of notice or performance, means any day that is not a Saturday, Sunday, or a State or federal holiday.

1.2 Royalty, Royalties and Fees shall mean those amounts due and owing from Developer to Owner under Section 5.1, Section 5.2, Section 5.4, Section 5.5 and Section 5.6 of this Easement.

1.3 Improvements shall mean all facilities, structures, equipment, machinery, roads, signage, transmission lines, materials and property of every kind and character, which are constructed, installed and/or placed on, above or under Owner's Property by or on behalf of Developer.

1.4 Interconnection Facilities shall mean all Improvements the purpose of which is to deliver electrical power from the Project to a utility grid or other system, including without limitation transformers and electrical transmission lines.

1.5 Mortgage means any mortgage, deed of trust or other real or personal property security instrument.

1.6 Mortgagee shall mean any mortgagee, beneficiary of a deed of trust, or other holder of a beneficial interest in a Mortgage.

1.7 Owner's Property shall mean the real property consisting of approximately 160 acres located in Hughes County, State of South Dakota ("State") as more particularly described on Exhibit A attached hereto and incorporated herein by this reference.

1.8 Project shall mean any and all Improvements, including WTGs and Interconnection Facilities, that are developed, constructed and/or operated on Owner's Property, and on other property to be acquired by easement or by fee purchase, by or on behalf of Developer or any transferee or assignee of Developer, as a single integrated system to generate and deliver electrical power to purchasers of such power.

NO GUARANTEE OF REVENUE FROM TURBINES

2. Easement Term.

2.1 Development Term; Construction Term; Operation Term. This Easement shall be exclusive and commence on the Effective Date and shall terminate on the day preceding the fiftieth (50th) anniversary of the Effective Date (the "Easement Term"). During the period commencing on the Effective Date and continuing for up to seven (7) years therefrom, and which period may be extended by Developer for an additional three (3) years by giving notice of such extension to Owner (the "Development Period"), Developer shall have only those rights of use set forth in Section 3.1(a). At any time during the Development Period, Developer may commence construction of a Project on Owner's Property, which shall operate to terminate the Development Period and to commence the "Construction Period." The Construction Period shall terminate and the "Operations Period" shall begin on the first day of the first month after the date of such Project's first commercial deliveries of electrical energy to the local utility grid. For the avoidance of doubt, first commercial deliveries of electrical energy from a Project in which Owner's Property is a part, but which electricity is generated from property other than Owner's Property, shall commence the Operations Period. In the event the Construction Period has not commenced within the Development Period (including any extensions of the Development Period pursuant to this Section 2.1), this Easement shall immediately terminate.

2.2 Statutory Term Limits on Wind Easements. Owner and Developer acknowledge that South Dakota Statutes Chapter 43, Section 13-17 provides that a wind easement shall become void after the fifth (5th) anniversary of the date that it was executed if the wind developer has not before then began the "development of the potential to produce energy from wind power associated with the easement" in the manner described in South Dakota Statutes Chapter 43, Section 13-20.2; provided, however, that said five year development period under a wind easement shall be extended to a maximum development period of twelve (12) years pursuant to South Dakota Statutes Chapter 43, Section 13-20.1 for any wind developer that files a sworn affidavit with the Public Utilities Commission which (i) states the intention of the wind developer to pursue a proposed wind energy project of five hundred megawatts or greater in nameplate capacity and a transmission solution for the project involving an interstate electric transmission line with a design of 345 kV or greater; and (ii) describes the geographic area covered by the project. In consideration of the foregoing, Owner and Developer hereby agree that if, within six (6) months prior to the fifth anniversary of the Development Period, it appears that development of the Project will not be sufficient to prevent this Easement from becoming void under the requirements of South Dakota law (whether by Developer beginning development of the potential to produce energy from wind power associated with the easement or filing a sworn affidavit with the Public Utilities Commission), then Owner and Developer will use good faith and diligent efforts to negotiate and enter into a new wind easement agreement, under substantially the same terms and conditions as provided in this Easement, for the further development of the Project.

3. Use of Owner's Property by Developer.

3.1 Permitted Uses. By this Easement, Owner hereby grants to Developer an exclusive easement, *in gross*, for wind resource assessment and analysis, wind energy conversion, for the collection and transmission of electric power, and for related and incidental purposes and activities

(collectively, "Operations") during the Easement Term (subject to the limitation on Developer's use of Owner's Property during the Development Period as provided in Section 2.1 above), including, without limitation:

(a) without limiting the generality of the foregoing, during all periods comprising the Easement Term, conducting studies of wind speed, wind direction, and other meteorological data, geotechnical studies, surveying, erection, operation, and maintenance of data collection equipment, ingress to and egress from Owner's Property by means of any existing roads and lanes thereon, and by such other route or routes as Developer or any transferee or assignee of Developer may construct on Owner's Property from time to time, for the benefit of and for purposes incidental to Operations on Owner's Property and for the benefit of and for purposes incidental to Operations, including Operations on lands other than Owner's Property;

can use land as a staging area
(b) constructing, reconstructing, erecting, installing, improving, replacing, relocating and removing from time to time, and maintaining, using, monitoring and operating, existing, additional or new (i) wind turbines, wind energy conversion systems and other power generation facilities, of any type or technology ("WTGs"), and associated towers, (ii) electrical transmission and distribution facilities, including without limitation, overhead and underground transmission, distribution or collector lines, circuit breakers, meters, conduit, footings, towers, poles, crossarms, guy lines, anchors, cabling and wires, (iii) overhead and underground control, communications and radio relay systems, (iv) substations, interconnection and/or switching facilities and electric transformers and transformer pads, (v) energy storage facilities, (vi) meteorological towers and wind measurement equipment, (vii) control buildings, control boxes and computer monitoring hardware, (viii) utility installations, (ix) safety protection facilities, (x) maintenance buildings and yards and construction laydown yards, (xi) roads and erosion control facilities, (xii) signs and fences, and (xiii) other improvements, fixtures, facilities, machinery and equipment associated or connected with the generation, conversion, storage, switching, metering, step-up, step-down, transmission, distribution, conducting, wheeling, sale or other use or conveyance of electricity (all of the foregoing, including the WTGs, collectively "Windpower Facilities"); and

(c) undertaking any other lawful activities, whether accomplished by Developer or a third party authorized by Developer, that Developer reasonably determines are necessary, helpful, appropriate or convenient in connection with, incidental to or to accomplish any of the foregoing purposes.

3.2 Additional Uses. Without limiting the generality of the foregoing:

(a) the Parties recognize that windpower technologies are improving at a rapid rate and that it is highly probable that Developer may (although Developer shall not be required to) replace from time to time existing WTGs on Owner's Property with newer model (and potentially larger) WTGs or other wind energy electrical generation facilities having increased energy capture and efficiency;

(b) this Easement includes the right of ingress to and egress from the Windpower Facilities over and along Owner's Property by means of any existing roads and lanes thereon, and by such other route or routes as Developer or any transferee or assignee of Developer

may construct on Owner's Property from time to time, for the benefit of and for purposes incidental to Operations on Owner's Property and for the benefit of and for purposes incidental to Operations, activities and projects on lands other than Owner's Property ("Access Easement"); and

(c) this Easement includes the right to conduct any and all Operations on Owner's Property or any portion thereof in connection with, for the benefit of and for purposes incidental to the Operations related to the Project (whether Developer performs such Operations on Owner's Property or on lands other than Owner's Property), including, without limitation, the right to (i) install and maintain on Owner's Property overhead and underground (at least four (4) feet deep) transmission lines and facilities for the transmission of electrical energy to or from lands other than Owner's Property, and (ii) install and maintain on Owner's Property overhead and underground (at least four (4) feet deep) communication lines and facilities for the transmission of communications to and from lands other than Owner's Property (collectively, "Transmission Easement").

3.3 Grant of Wind Easement. Any obstruction to the free flow of the wind by Owner or persons other than Developer or any transferee or assignee of Developer or persons claiming through or under Developer or any transferee or assignee of Developer is prohibited throughout the entire area of Owner's Property, which shall consist horizontally three hundred and sixty degrees (360°) from any point where any Windpower Facilities are or may be located at any time or from time to time (each such location referred to as a "Site") and for a distance from each Site to the boundaries of Owner's Property, together vertically through all space located above the surface of Owner's Property, that is, one hundred eighty degrees (180°) or such greater number or numbers of degrees as may be necessary to extend from each point on and along a line drawn along the surface from each point along the exterior boundary of Owner's Property through each Site to each point and on and along such line to the opposite exterior boundary of Owner's Property. Trees, structures and improvements located on Owner's Property as of the Effective Date of this Easement shall be allowed to remain and Developer may not require their removal. After the Effective Date of this Easement, Owner may not place or plant any trees, structures or improvements on Owner's Property exceeding thirty (30) feet in height that may, in Developer's sole judgment, impede or interfere with the flow of wind to any Site or the Windpower Facilities, unless Owner has received prior written approval from Developer for any such trees, structures or improvements.

NO TIMELINE ON ANSWER WRITTEN IN CONTRACT

3.4 Limitation on Use. Developer shall not use Owner's Property for any purpose other than as set forth in Sections 3.1, 3.2 and 3.3.

3.5 Placement of Windpower Facilities. Developer shall confer with Owner prior to construction of any Windpower Facilities on Owner's Property to discuss the placement of any such Windpower Facilities thereon, and shall consider and use commercially reasonable efforts to address any comments, concerns or suggestions Owner may have as to the location of such Windpower Facilities on Owner's Property; provided, however, that the final decision regarding placement of such Windpower Facilities shall be in the sole discretion of Developer. Notwithstanding the foregoing, Developer shall not place any WTGs within one thousand four hundred feet (1,400') of Owner's existing residence on Owner's Property.

↓
DIDN'T RECOGNIZE NEIGHBOR THAT DOESN'T PARTICIPATE.

NO LIMIT ON TRANSMISSION LINE DISTANCE
FROM RESIDENCE

3.6 Damage to Owner's Crops & Personal Property. The Parties anticipate and acknowledge that Owner or its renters may suffer damage to crops (harvested and unharvested, and including fallow ground), livestock forage, drain tiles, fences, and other personal property or improvements on Owner's Property during Developer's construction, installation, maintenance, repair, replacement, removal or restoration of the Project(s) on Owner's Property. Developer shall compensate Owner for any such damage as follows:

3.6.1 Crop & Forage Damage. In connection with any crop or livestock forage damage caused by Developer's Operations on Owner's Property (including the inability of Owner to plant, work or harvest any crop due to Developer's Operations), Developer shall pay Owner fair compensation for such damage based on the following formula: Unit Price x Average Unit Yield Per Acre of Undamaged Portion of Owner's Property x Acres Damaged = "Crop/Forage Damage Compensation." The "Unit Price" for damaged crops or livestock forage will be based on the local market price currently in effect for that crop or livestock forage. Compensation for damage to fallow ground shall be based on the Unit Price of crop previously harvested on that ground within the prior year's harvest cycle. The "Average Unit Yield Per Acre" shall be based on the average unit yield over the preceding three (3) years.

3.6.2 Soil Compaction. As to the compaction of soil on the area of Owner's Property not occupied by the Project after construction is complete, which compaction is caused by Developer's construction, installation, maintenance, repair, replacement, removal or restoration of the Project on Owner's Property, Developer shall compensate Owner for the area of compacted soil ("Soil Compaction Compensation") pursuant to the following terms and conditions: (i) Developer shall pay the Soil Compaction Compensation, if any, to Owner as soon as practicable after the harvest cycle that follows Developer's construction, installation, maintenance, repair, replacement, removal or restoration of the Project which caused the soil compaction; (ii) Developer shall only be obligated to pay owner Soil Compaction Compensation if the average crop or forage unit yield per acre on the compacted soil area of Owner's Property is at least ten percent (10%) lower than the average crop or forage unit yield per acre on Owner's Property for the previous three (3) years; and (iii) the Soil Compaction Compensation = (Unit Price x Average Unit Yield Per Acre of Non-Compacted Portion of Owner's Property x Acres of Compacted Soil) - (Unit Price x Units Harvested from Compacted Soil Area). The "Unit Price" for Soil Compaction Compensation will be based on the local market price currently in effect for the affected crop or livestock forage. The "Average Unit Yield Per Acre" shall be based on the average unit yield over the preceding three (3) years. The Soil Compaction Compensation is the only compensation Owner shall receive from Developer for any compaction of soil on Owner's Property caused by Developer's Operations.

3.6.3 Native Grasses. Notwithstanding anything to the contrary in this Easement, Developer shall reseed any areas of Owner's Property with native grasses that are damaged, destroyed or removed during the construction, installation or maintenance of the Project(s) on Owner's Property, and upon restoration of Owner's Property pursuant to Section 17.2 herein below.

3.6.4 Damage to Other Personal Property. Unless otherwise specified herein, Developer shall pay Owner fair market replacement cost for damage to drainage tiles, fences, and

other personal property or improvements on Owner's Property resulting from Developer's Operations on Owner's Property.

3.6.5 Damage to Livestock. If Developer's Operations on Owner's Property causes the injury or death of any of Owner's livestock, then Developer shall compensate Owner for such injury or death at an amount equivalent to the value of the injured or dead livestock calculated at a rate of (i) Owner's contracted rate of sale to market for the livestock, if any, or (ii) the market cost for Owner's replacement of like kind livestock.

3.6.6 Limitation of Crop & Personal Property Damage Compensation. To the extent Developer pays Owner Crop/Forage Damage Compensation, Soil Compaction Compensation, or compensation for damage to other personal property or improvements, or similar losses suffered by a tenant of Owner, Owner shall pay the tenant the applicable compensation and Owner agrees to indemnify and hold Developer harmless from any failure by Owner to advance or remit such compensation to its tenant. After construction is complete, Developer shall not be responsible to pay Owner or its renters any losses of income, rent, business opportunities, profits or other losses arising out of Owner's inability to grow crops, livestock forage or otherwise use that portion of Owner's Property occupied by the Project. Nothing in this Section 3.6 shall be interpreted to reduce or limit any liability Developer may incur to Owner for losses (other than consequential damages) suffered by Owner due to damage to crops, drain tiles, improvements, or fields caused by an accidental event.

3.6.7 Arbitration of Disputes. If the Parties cannot reach agreement as to the amount which would constitute Crop/Forage Damage Compensation, Soil Compaction Compensation, or fair market replacement cost for other losses or damage specified under this Section 3.6, then the issue shall be submitted to binding arbitration before a qualified appraiser or any other arbitrator mutually agreed to by the Parties.

3.7 Conservation Program. If Owner is a party to a Conservation Reserve Program contract ("CRP Contract") with the U.S. Department of Agriculture pursuant to 7 C.F.R. Part 1410, Owner shall provide Developer with a true and complete copy of such CRP Contract, together with all amendments and modifications. To the extent Owner must remove any portion of Owner's Property from participation in the Conservation Reserve Program ("CRP") or similar program to accommodate, or as a result of, the Windpower Facilities, and Owner thereby incurs any penalties or reimbursement obligations, Developer agrees to reimburse Owner the amount of such penalties and obligations or to pay the amounts on behalf of Owner. Owner shall notify Developer of any such penalties or reimbursement obligations as soon as practicable after becoming aware of those penalties or obligations. Owner shall cooperate with Developer in completing and submitting documents to obtain any exemptions allowed under the CRP for the use of Windpower Facilities on Owner's Property covered by a CRP Contract.

3.7.1 Release of Conservation Reserve Program Information. Owner hereby consents to the Farm Service Agency's ("FSA") disclosure and release to Developer of any and all CRP information and data, in print format, digital format or otherwise, regarding or related to Owner's Property, including, without limitation, the CRP Contract terms and the FSA's digital CRP mapping data, at any time as Developer may reasonably request from Owner or the FSA throughout the Easement Term. A separate consent form, providing the same consent by Owner

to the disclosure and release of CRP information and data as provided under this Section 3.7.1, is attached to this Easement as Exhibit C, and incorporated herein by this reference, which consent form shall be signed by Owner, in single or counterpart form, and which may be used by Developer in obtaining said CRP information and data from the FSA in lieu of Developer's presenting and disclosing to the FSA the entirety of this Easement

3.8 Fences, Gates & Cattle Guards. Where Developer's Operations on Owner's Property cause damage to or destruction of Owner's gates or cattle guards, Developer shall, at Developer's sole cost and expense, install, repair or replace such gates or cattle guards, as necessary. If Owner keeps livestock on Owner's Property, then Developer shall install a gate and cattle guard in any fence where a road which is newly constructed by Developer crosses the fence lines. Developer shall design and construct all of the newly installed, repaired or replaced gates or cattle guards, and all such gates and cattle guards shall be of at least the same quality as the gates and cattle guards that were damaged or destroyed or which are already in existence on Owner's Property. Furthermore, Developer shall repair or replace any of Owner's existing fencing that Developer damages or destroys as a result of its Operations on Owner's Property. Developer shall design and construct such fences and all such replacement fencing shall be of at least the same quality and height as the fencing that was damaged or destroyed. Developer will consider Owner's reasonable requests for construction or replacement of any fences, gates and cattle guards.

3.9 Prohibition of Hunting. Neither Developer nor any of its agents, employees, contractors, invitees or Grantees (as defined below) shall hunt on Owner's Property.

3.10 Uses by Multiple Projects. Developer may use Owner's Property for one Project or Developer may divide Owner's Property for use in multiple Projects. In the event that Developer elects to construct and operate more than one Project, then Owner agrees to enter into new and separate Easements, and to amend this Easement, to permit each such separate Project to have a separate easement which applies only to such easement's respective Project. All such new and separate easements shall have the same terms and conditions as this Easement except that (a) Owner's Property shall be defined specifically in each case, (b) each separate Developer shall make the payments required under Section 5 with respect to its Project or Projects, and (c) the separate Developers may apportion this Easement to the then grantees under the other easements for easements for access, distribution, transmission, communications or other purposes associated with or for the benefit of other wind projects.

3.11 Noninterference. Developer shall have the sole and exclusive right to convert all of the wind resources of, and to conduct Operations (including without limitation the installation or placement of WTGs, electrical transmission and distribution lines, substations, meteorological towers and transformers) on, Owner's Property; Owner shall not grant any rights in Owner's Property purporting to permit others to conduct Operations on Owner's Property in derogation of Developer's sole and exclusive right to conduct Operations on Owner's Property. Without the prior written consent of Developer, Owner shall not (i) waive any right available to Owner or grant any right or privilege subject to the consent of Owner by law or contract, including without limitation any environmental regulation, land use ordinance or zoning regulation, with respect to setback requirements, noise limitations or other restrictions and conditions respecting the placement of WTGs and other equipment ancillary to wind farm operations on parcels adjacent to or within 2500 feet of Owner's Property or (ii) grant, confirm, acknowledge, recognize or acquiesce in any

right claimed by any other person to conduct Operations on Owner's Property whether arising in judicial proceedings or otherwise and Owner agrees to give Developer notice of any such claims or proceeding with respect to such claims and to cooperate with Developer in resisting and disputing such claims.

3.12 Mineral Development. Notwithstanding anything herein to the contrary, and provided Owner in fact owns the mineral and other similar sub-surface resource rights in and under Owner's Property, Owner shall have and does hereby expressly reserve the right to develop or to allow a third party to develop the minerals (including oil and gas), hydrocarbons, water, gravel, or any other similar resource in, to or under Owner's Property, if any, so long as such development, including, without limitation, any drilling or mining, does not materially interfere with Developer's use of Owner's Property under this Easement once Developer has determined a WTG Location on Owner's Property, and does not materially diminish the amount of available land surface of Owner's Property available to Developer to install Windpower Facilities thereon. If requested by Owner, under the terms of this Section 3.12, Developer hereby agrees to cooperate in good faith with Owner's mineral development and each party's respective uses of the surface estate of Owner's Property during the Easement Term, so long as such uses are consistent with the easement granted hereunder and the terms and provisions of this Easement.

If Owner develops or allows a third party to develop the minerals (including oil and gas), hydrocarbons, water, gravel, or any other similar resource in, to or under Owner's Property during the Easement Term, Owner shall expressly retain the right to select, determine, prohibit or control the location of sites for drilling, exploitation, production, and/or exploration of minerals, hydrocarbons, water, gravel, or any other similar resource in, to or under Owner's Property. Owner shall exercise such right so as to minimize interference with Developer's Operations on Owner's Property, and those rights implied in favor of the mineral estate of Owner's Property are to be exercised with due regard for the rights of Developer as they pertain to the surface use of Owner's Property. Under the terms of this Section 3.12, Owner will execute, and shall use good faith efforts to cause and facilitate any third party to whom it has granted rights to develop the minerals (including oil), hydrocarbons, water, gravel or any other similar resources in, to or under Owner's Property during the Easement Term, to execute, a surface use agreement or non-disturbance agreement in form and substance reasonably acceptable to Developer, Owner and such third party.

3.13 No Obligation to Install or Maintain Installed WTGs. Nothing expressly or impliedly contained in this Easement shall be construed as requiring Developer to (a) undertake construction or installation of any Improvements on Owner's Property or elsewhere, (b) continue operation of any Windpower Facilities from time to time located on Owner's Property or elsewhere or (c) generate or sell any minimum or maximum amount of electrical energy from Owner's Property. Developer may construct and install as many WTGs on Owner's Property as Developer deems reasonable or appropriate. *- what if they sell to another company that is stable?*
\$300,000 to REMOVE WTG

4. Permits and Governmental Approvals. Developer shall be responsible for obtaining at its sole cost and expense any governmental approvals necessary for the construction and operation of the Project, including but not limited to any subdivision, zoning variances, building permits, approvals, environmental statements, licenses or authority from any county, state or federal authority and shall pay all costs associated therewith. Owner shall cooperate with Developer as

necessary to obtain any governmental approvals, provided that Developer shall reimburse Owner for its reasonable out-of-pocket expense directly incurred in connection with such cooperation.

5. **Payments to Owner.** Developer shall pay Owner Royalties and Fees all as the foregoing are set forth in the following subsections.

5.1 **Royalties.** For each calendar year of the Operations Period commencing on January 1 of each year during the Operations Period ("**Operations Year**"), Developer shall pay to Owner the greater of (a) \$3,500.00 per megawatt (MW) of installed nameplate capacity (the "**Minimum Royalty**"), and (b) \$1.25 per megawatt hour (MWh) of energy produced by WTGs on Owner's Property, measured at the controller of each WTG, during each Operations Year (the "**Generation Royalty**"). The Generation Royalty shall be set and adjusted throughout the Operations Period as follows:

Years 1-15: \$1.25/MWh
Years 16-30: \$1.75/MWh
Years 31-50: \$2.25/MWh

Developer shall pay Owner the Minimum Royalty annually in advance within thirty (30) days of the first day of each Operations Year. The Minimum Royalty shall be adjusted upward annually after each Operations Year (starting after the first complete twelve month Operations Year) by the same percentage increase between the most recent annual figure and the previous year in the annual Consumer Price Index for All Urban Consumers (CPI-U) for the U.S. City Average for All Items, 1982-84=100 (unadjusted) ("**Index**"). Notwithstanding the foregoing, the maximum annual upward adjustment shall not exceed four percent (4%). If there has been a decrease between the most recent annual Index figure and the previous year, or an increase of less than one percent (1%), the adjustment to the Minimum Royalty payment amount will be an increase of one percent (1%). If, in the mutual agreement of the Parties, for any reason the Index is unavailable or unusable, the Parties agree that the index most similar in nature as published in the *Wall Street Journal* shall be substituted in its place.

Royalty payments shall be trued up at the end of each Operations Year, and, in the event the Generation Royalty exceeds the Minimum Royalty for any applicable Operations Year, Developer shall pay Owner the Generation Royalty in arrears as a supplemental true up payment, if any is due, within thirty (30) days of the end of each Operations Year, such that Developer shall pay Owner the amount of the Generation Royalty that exceeds the Minimum Royalty for the applicable Operations Year.

Notwithstanding the foregoing, (i) the initial Minimum Royalty payment shall be prorated at the daily value of the Minimum Royalty for the number of days from the commencement of the Operations Period through the last day of that initial Operations Year (i.e., December 31), and (ii) the initial Generation Royalty payment shall begin to accrue on the commencement of the Operations Period.

For purposes of this Section 5.1, "installed nameplate capacity" means the maximum power output of a WTG according to the manufacturer's specifications for WTGs in the Project which have been placed in commercial operation and have not been permanently removed from

service after any termination, surrender or expiration of this Easement as provided in Section 15 and Section 17 herein, in each case as of the first day of the month with respect to which the calculation is made.

5.2 Alternate Royalty. In the event that no WTGs are placed on Owner's Property, but Owner's Property is either: (i) used for the placement, operation and maintenance of Windpower Facilities other than WTGs, (ii) located adjacent to property on which WTGs are located, or (iii) otherwise located within a one (1) mile radius of a WTG within the Project, then Developer shall pay Owner a royalty of \$15.00 per acre of Owner's Property per Operations Year ("Alternate Royalty"). The initial Alternate Royalty payment shall be prorated at the daily value of the Alternate Royalty for the number of days from the commencement of the Operations Period through the last day of that initial Operations Year due and payable in advance within thirty (30) days of the commencement of the Operations Period, and the Alternate Royalty shall thereafter be paid annually in advance within thirty (30) days of the first day of each Operations Year. The Alternate Royalty shall be adjusted upward annually after each Operations Year (starting after the first complete twelve month Operations Year) by the same percentage increase between the most recent annual figure and the previous year in the Index. Notwithstanding the foregoing, the maximum annual upward adjustment shall not exceed four percent (4%). If there has been a decrease between the most recent annual Index figure and the previous year, or an increase of less than one percent (1%), the adjustment to the Payment amount will be an increase of one percent (1%). If, in the mutual agreement of the Parties, for any reason the Index is unavailable or unusable, the Parties agree that the index most similar in nature as published in the *Wall Street Journal* shall be substituted in its place.

5.3 Records; Right to Review. Developer shall keep records of: (i) the amount of Generation Royalty payable to Owner during each Operations Year; and (ii) the amount of Minimum Royalty previously paid to Owner pursuant to Section 5.1 in each such Operations Year. Developer shall grant Owner (or Owner's consultants or agents) reasonable access to those records at the principal place of business of Developer. Owner may examine such records relating to transactions under, and the administration of, this Easement at any time upon request with reasonable notice and during normal business hours.

5.4 Development and Construction Period Fees. Developer shall pay as Fees during the Development Period One Thousand Two Hundred Dollars (\$1,200.00) per year, or Four Dollars (\$4.00) per acre per year of the Development Period, whichever is greater, commencing on the Effective Date. In the event Developer elects to exercise its right to extend the Development Period pursuant to Section 2.1 of this Easement, Developer shall increase the Fees during such extended Development Period to One Thousand Seven Hundred Dollars (\$1,700.00) per year, or Six Dollars (\$6.00) per acre per year, whichever is greater. The initial Development Period Fee shall be paid in advance within thirty (30) days of the Effective Date, and the Development Period Fee shall thereafter be made annually in advance on the anniversary of the Effective Date until commencement of the Construction Period or earlier termination of this Easement. Developer shall pay as Fees during the Construction Period Three Thousand Dollars (\$3,000.00) per year, or Eight Dollars (\$8.00) per acre per year of the Construction Period, whichever is greater. The initial Construction Period Fee shall be paid in advance in full within thirty (30) days of the commencement of the Construction Period, and any subsequent Construction Period Fee shall be paid in advance on the anniversary of the commencement of the Construction Period until

commencement of the Operations Period or earlier termination of this Easement, and shall be prorated for any partial year in which it is paid.

5.5 Installation Fees. In addition to other Fees which may be due Owner hereunder, Developer shall pay the following Fees to Owner as applicable: (a) fair market purchase price or annual fair market rent to be negotiated in good faith and mutually agreed upon by Developer and Owner for the actual area needed for the construction, installation, use and operation of any facility, building or other improvement other than an electrical substation or WTG on Owner's Property, including but not limited to an operations and maintenance facility, a temporary construction laydown yard or a permanent meteorological tower, which fair market purchase price will be paid in advance or which fair market rent shall be paid within thirty (30) days of the completion of construction and installation of any such facility, building or other improvement, and thereafter paid annually in advance on the anniversary of the completion of said construction and installation; (b) a one-time payment of Eighteen Dollars and Fifty Cents (\$18.50) per rod of new roads and overhead transmission lines (constructed within 10 years of the Effective Date and a fair market value per rod for any other new roads or overhead transmission lines thereafter constructed) within thirty (30) days of the completion of construction and installation of same upon Owner's Property (except temporary roads created for construction only); and (c) fair market purchase price or annual fair market rent to be negotiated in good faith and mutually agreed upon by Developer and Owner, for the actual area needed for the construction, installation, use and operation of a substation which shall be constructed in an area no less than three (3) acres and no greater than ten (10) acres on Owner's Property, which fair market purchase price will be paid in advance or which fair market rent will be paid within thirty (30) days of the completion of said construction and installation and thereafter paid annually in advance on the anniversary of the completion of said construction and installation (collectively "Installation Fees").

5.6 Meteorological Tower Installation & Fees; Development Period. Notwithstanding any other provisions of this Easement pertaining to the installation of buildings or other improvements on Owner's Property, any meteorological tower installed on Owner's Property during the Development Period (including any extensions of the Development Period pursuant to Section 2.1) will be installed at a mutually agreeable location. Developer shall pay Owner an annual payment of One Thousand Dollars (\$1,000.00) per meteorological tower that is installed during the Development Period. Such payment shall be made annually in advance, commencing on the date that Developer completes installation of any such meteorological tower. Developer's obligation to make payments pursuant to this Section 5.6 shall terminate when Developer removes the meteorological tower from Owner's Property, and returns that portion of Owner's Property used for the meteorological tower to substantially the same condition as existed immediately prior to installation of the meteorological tower.

5.7 Payment of Fees and Royalties. Developer shall make payments that are due to Owner and remit such payments to Owner's address as follows: Steven & Tonja Jessen (50%), 20220 324th Avenue, Harrold, SD 57536; Ronald Jessen (50%), 20509 324th Avenue, Harrold, SD, 57536. Payments shall be accompanied by reports of current Project production. Owner shall give Developer advance written notice of any pending sale of the Owner's Property, which notice shall include the name and the address of the party that is under contract to purchase Owner's Property. In accordance with South Dakota Statutes Chapter 43, Section 13-17, all payments made under

Section 5 of this Easement are to be paid to the owner of record of the Owner's Property. In no event will Owner be allowed to sever payments rights due hereunder from the Owner's Property.

6. Taxes and Assessments.

6.1 Payment of Taxes.

6.1.1 Developer covenants and agrees to pay prior to delinquency all real and personal property and other taxes, general and special assessments, and other charges of every description levied or assessed against Developer's Improvements or against Owner's Property attributable to Developer's installation of the Improvements on Owner's Property owned by or under the control of Developer ("Developer's Taxes"), subject to Developer's right to contest such taxes under Section 6.2 below, and subject further to Owner's cooperating with Developer in obtaining reasonable notice of the due dates, amounts and method of payment of such Developer's Taxes and assessments. Except as expressly provided otherwise in this Section 6.1.1, Owner shall pay, prior to delinquency, any and all taxes applicable to Owner and its interest in Owner's Property ("Owner's Taxes"). If Owner shall fail to pay Owner's Taxes prior to delinquency as set forth in this Section 6.1.1, then Developer shall have the right (but not the obligation) to pay Owner's Taxes and to be reimbursed for any such payment (including penalties) together with interest at the Default Interest Rate (defined below) upon demand or to offset any such amounts against future payments due under the Payment Agreement.

6.1.2 Developer's failure to pay the Developer's Taxes prior to delinquency shall constitute a default pursuant to Section 16 hereof. In the event of such a default by Developer under this Section 6.1.2, Owner shall have the right to cure such default by payment of those Developer's Taxes which are due and such amount shall immediately become due and payable by Developer, together with interest plus penalties on such taxes from the due date of such taxes until the date of payment by Developer, such interest at a per annum rate (the "Default Interest Rate") equal to the lesser of (i) the prime rate ("Prime Rate") quoted in The Wall Street Journal under the Money Rates column during the period the indebtedness in question is outstanding, as such prime rate changes from time to time, plus six (6) percent or (ii) the maximum interest that may be charged on such indebtedness under the applicable law (if any).

6.1.3 Owner and Developer shall cooperate with each other to apply for and secure any property tax abatements, exemptions and reductions that may be available to them or to the Owner's Property, the Developer's interest in the Owner's Property or Developer's Improvements upon the Owner's Property.

6.2 Developer's Right to Contest. Developer may contest the legal validity or amount of any such taxes, assessments, or other charges for which it is responsible under this Easement, and may institute such proceedings as it considers necessary, provided that such contest shall be prosecuted to a final conclusion as speedily as possible, and Developer shall bear all expenses in pursuing such contest or proceeding. With respect to any tax for which Developer is responsible which may constitute a lien on Owner's Property, Developer shall promptly pay such tax unless the proceeding in which it contests such tax shall operate to prevent or stay the collection of the tax so contested or unless Developer removes any such lien by bonding or otherwise. Owner agrees to render to Developer all reasonable assistance, at no cost or expense whatsoever to Owner,

in contesting the validity or amount of any such taxes, assessments or charges, including joining in the signing of any reasonable protests or pleadings which Developer may reasonably deem advisable to file; provided, however, that Developer shall reimburse Owner for its reasonable attorneys' fees incurred in connection with providing such assistance.

7. Liens. Developer agrees to pay promptly for all costs and charges for all labor done or materials furnished for any work of repair, maintenance, improvements, alteration or addition, including installation of WTGs, undertaken by Developer in connection with development of Owner's Property by Developer, and Developer hereby indemnifies and agrees to hold Owner and Owner's Property free, clear and harmless of and from all mechanics liens and claims of liens and all other liability, claims and demands, including attorneys' fees, that arise by reason of such work. If any such mechanics lien shall at any time be filed against Owner's Property, or any portion thereof, Developer shall either cause the same to be discharged of record within forty-five (45) days after receipt of notice that such lien has been filed, or if Developer in its discretion and in good faith determines that such lien should be contested, Developer shall cause said lien to be removed from Owner's Property by bonding or otherwise. Notwithstanding anything to the contrary stated in this Section 7, Developer shall not commence construction on Owner's Property until five (5) days after Owner has received written notice from Developer stating the date when Developer intends to commence Construction so as to give Owner the opportunity, should Owner elect to do so, to post a notice of nonresponsibility on Owner's Property.

8. Maintenance of Owner's Property.

8.1 Maintenance. Throughout the Easement Term, Developer shall, at Developer's sole cost and expense, maintain the Improvements and all areas of Owner's Property used by Developer in Developer's operations in good order and repair and in accordance with all applicable laws, rules, ordinances, orders, and regulations of all governmental agencies.

8.2 Clean Condition. Developer shall not unreasonably clutter Owner's Property and shall collect and dispose of any and all of Developer's refuse and trash.

8.3 Noxious Weeds. Developer shall use commercially reasonable efforts to prevent bringing on to Owner's Property any noxious weed species, including washing all equipment (whether mobile or stationary, and including automobiles, trucks, dirt-moving equipment, cranes, tractors and equipment carriers), prior to its entry on to Owner's Property, that will touch the ground and that Developer determines could reasonably be expected to introduce noxious weed species on Owner's Property. If any noxious weed species appears on or adjacent to any site of Developer's Operations on Owner's Property, including on any roads or routes used by Developer, then Developer will take steps necessary to eliminate the same from those sites. This provision is not intended to make Developer an unlimited insurer against noxious weed species intrusion on Owner's Property, but to the contrary, is intended solely to be applicable to those situations where it is reasonably evident that such intrusion was caused by Developer's Operations.

8.4 Failure to Comply. If Developer fails to comply with any obligation of Developer under this Section 8, Owner shall have the right but not the obligation, following the notice and cure provisions set forth in Section 16.1(iii), to take such corrective measures as Owner deems necessary in its sole discretion and charge the reasonable cost and expense thereof to Developer

plus interest at the Default Interest Rate, which amounts shall be due with the next payment due pursuant to Section 5; provided, however, that Owner shall only be obligated to provide one (1) business days' written notice to Developer before taking corrective action to cure Developer's failure to maintain any Access Roads (as defined in Section 19.1.2 below) in such a manner so that they are not open for Owner's use.

9. Improvements

9.1 Ownership. All Improvements shall at all times remain the property of the Developer or its successors and assigns and the Owner shall have no right, title or interest therein, except as otherwise provided herein.

9.2 Removal. All Improvements constructed or placed on Owner's Property by Developer during the Easement Term may be removed, repaired or replaced by Developer at any time during and at the end of the Easement Term, as more fully set forth in Section 17.

10. Security. Developer shall provide, at its sole expense, all security measures reasonably necessary, in Developer's sole determination, for Owner's Property, including, if reasonably necessary, warning signs, closed and locked gates, and other measures appropriate and reasonable to protect against damage or destruction of Developer's WTGs and other Windpower Facilities, or injury or damage to persons or property on Owner's Property. If Owner maintains livestock on Owner's Property, Developer shall install a gate in any fence where a newly constructed road by Developer crosses the fence line.

11. Developer's Access. Developer shall at all times during the Easement Term have access to Owner's Property and to Developer's Improvements, including any Interconnection Facilities located thereon, for all purposes specified in this Easement.

12. Insurance

12.1 Commercial General Liability Insurance. At all times during which Developer is conducting any activities on Owner's Property, and at all times during the Easement Term, Developer shall, at its own cost and expense, obtain and maintain in effect commercial general liability insurance, covering all aspects of Developer's Operations while on Owner's Property. Developer may satisfy the requirements of this Section 12.1 by maintaining a qualified self-insurance program, pursuant to which Developer or its affiliate is itself acting as though it were the insurance company providing the insurance required under the provisions hereof and Developer shall pay any amounts due in lieu of insurance proceeds because of self-insurance, which amounts shall be treated as insurance proceeds for all purposes under this Easement. Developer's commercial general liability insurance policy shall name Owner as an additional insured as respects general liability coverage thereunder, and shall provide bodily injury and property damage coverage, written on a primary and non-contributory basis with any insurance maintained by Owner, with limits of at least Two Million Dollars (\$2,000,000.00) combined single limit, per occurrence and in the aggregate; provided that such amount may be provided as part of a blanket policy covering other properties. Upon request by Owner, Developer shall provide to Owner a certificate evidencing such coverage during the Easement Term. In the event that Developer elects to self-insure, Developer shall provide Owner with certificates of self-insurance

specifying the event of self-insurance coverage hereunder. Any insurance coverage provided by Developer shall be for the benefit of Developer and Owner, as their respective interests may appear. After each fifteen (15) years of the Easement Term, Developer shall adjust the limit of required insurance, if necessary, to a commercially reasonable amount.

12.2 Requirements of Policies. The insurance required in this Section 12 shall be with an insurance company or companies authorized to do business in the State of South Dakota. All the insurance policies referred to in this Section 12 shall contain a provision that they cannot be cancelled without first giving Owner thirty (30) days' notice in writing of the company's intention to do so. If Developer does not pay the premiums thereon when due, Owner may procure and maintain insurance and any such premium plus interest at the Default Interest Rate shall be payable to Owner with the next payment due pursuant to Section 5.

13. Indemnity.

13.1 Indemnity by Developer. Developer shall defend, indemnify and hold Owner harmless from and against all loss, damages, liability and claims of liability, for damage to property or injury to persons resulting from the activities of Developer, its agents, contractors, employees, guests, invitees, licensees and permittees (collectively, "Developer's Agents") on or about Owner's Property, except to the extent that such liability or loss is due to any negligent acts of Owner or its agents, employees, contractors, guests, invitees, licensees and permittees (collectively, "Owner's Agents"). Owner hereby waives any claims against Developer for damage or injury directly suffered by Owner arising as a result of any audible or electromagnetic noise, electrical interference, radio frequency interference, vibration, visual impacts, flicker, shadows or weather-related effects or hazards attributable to Developer's Operations on Owner's Property; provided that nothing herein shall be deemed to release Developer from its obligation to indemnify and hold harmless Owner from third party claims under the first sentence of this Section 13.1.

13.2 Indemnity by Owner. Owner shall defend, indemnify and hold Developer harmless from and against all liability and claims of liability, for damage to property or injury to persons resulting from the activities of Owner and Owner's Agents on or about Owner's Property during the Easement Term; except to the extent that such liability or loss is due to any acts of Developer or Developer's Agents. — All Lodge relations
— LIABILITY DOESN'T FALL ON INDIVIDUAL — LAND OWNER

13.3 Hazardous Materials.

13.3.1 Owner shall not violate, and shall indemnify Developer for, from and against any claims, costs, damages, fees or penalties arising from a present or future violation by Owner or Owner's agents or contractors of, any federal, state or local law, ordinance, order, or regulation relating to the generation, manufacture, production, use, storage, release or threatened release, discharge, disposal, transportation or presence of any substance, material or waste which is now or hereafter classified as hazardous or toxic, or which is regulated under current or future federal, state or local laws or regulations, on or under Owner's Property.

13.3.2 Developer shall not violate, and shall indemnify Owner against, any claims, costs, damages, fees or penalties arising from a present or future violation by Developer or Developer's agents or contractors of any federal, state or local law, ordinance, order, or regulation

relating to the generation, manufacture, production, use, storage, release or threatened release, discharge, disposal, transportation or presence of any substance, material or waste which is now or hereafter classified as hazardous or toxic, or which is regulated under current or future federal, state or local laws or regulations, on or under Owner's Property.

14. Assignments and Other Grants.

14.1 Assignment by Developer. Developer may assign or transfer, without the prior written consent of Owner, Developer's interest under this Easement, *provided that* Developer shall provide Owner with written notice of such assignment within a reasonable time of such assignment. Developer may, without the consent of Owner, assign, or grant a security interest in, this Easement for financing purposes.

TRANSFER TO ANOTHER ENTITY - NO RECOURSE.

14.2 Delegation and Apportionment. Developer may, at Developer's election, (a) delegate performance of any or all of its covenants hereunder to any one or more transferees or other person or entities, or (b) apportion the interests granted by this Easement, provided such apportionment does not impose burdens on the Owner's Property greater or different than those Developer has a right to impose pursuant to this Easement. Any such delegate or grantee of an apportionment shall be a "Grantee." Any performance delegated by Developer to a Grantee shall be deemed Developer's performance; but Developer shall not be deemed to be released from any obligation to Owner hereunder by reason of such delegation, without the written consent of Owner, which consent shall not be unreasonably withheld, conditioned or delayed.

14.3 Notice; Right to Cure Default. Owner agrees that, if Developer or any Grantee has previously provided Owner with such Grantee's name and address for the purpose of receiving notices under this Easement, then in the event that Owner gives notice to Developer of any event of default by Developer hereunder, Owner shall simultaneously give such Grantee a copy of such notice. Such Grantee of whom Owner has notice shall have the right, but not the obligation, to cure any default(s) of Developer during the cure period(s) given to Developer hereunder, and if Grantee cures or causes to be cured any default (other than performance unique to Developer that cannot reasonably be performed by Grantee), such cure shall be as effective as if done by Developer; provided, however, that in the event Grantee is prohibited from curing Developer's default by any process, stay or injunction issued by any governmental authority or pursuant to any bankruptcy or insolvency proceeding or other similar proceeding involving Developer, then the time period specified herein for curing a default shall be extended for the period of such prohibition.

14.4 Substation Right Holder. Notwithstanding anything to the contrary contained in this Easement, Developer and any subsequent assignee shall have the right without the consent of Owner, to assign, convey, apportion, and transfer to a third party (together with its grantees, successors and assigns, a "Substation Right Holder"), all rights under this Easement necessary or appropriate for the construction, installation, operation, maintenance, replacement, relocation, removal, access to, and egress from an electric substation and related facilities for the gathering and transmission of electricity (a "Substation" and the "Substation Rights"). The Substation Rights may be further assigned, transferred, apportioned, and conveyed, by subeasement or otherwise, in whole or in part, without the consent of Owner. If this Easement or the easements or other rights granted to Developer hereunder are assigned, conveyed, apportioned, or transferred,

in whole or in part, to a Substation Right Holder, the Substation Right Holder and not Developer, shall be responsible for the payments due under Sections 5.4, and 5.5(c) of this Easement, but only in relation to the improvements constructed pursuant to the Substation Rights (the "Electrical Substation Payment"). Upon an assignment, transfer, conveyance, apportionment, or partial assignment to a Substation Right Holder, as provided herein, Developer shall be released from any obligation to Owner in respect of the Substation Rights. A Substation Right Holder shall not be required to make any other payments under this Easement or comply with any obligations of Developer under this Easement not directly relating to the Substation or the Substation Rights. In the event a Substation Right Holder holds an interest in less than all of this Easement or the easements or other rights granted to Developer hereunder, any default under this Easement shall be deemed remedied, as to such Substation Right Holder's partial interest, and Owner shall not disturb such partial interest, if the Substation Right Holder, shall have cured its pro rata portion of the default by paying the Electrical Substation Payment. Following the assignment, transfer, conveyance, apportionment, or partial assignment to the Substation Right Holder of Substation Rights, no Substation may be constructed, developed or operated on the Owner's Property without the consent of the Substation Right Holder. A Substation Right Holder shall have all of the rights of a Grantee under Sections 14.2 and 14.3 of this Easement, and all of the rights of a Mortgagee under Section 21 of this Easement, so that the covenants contained in such sections shall also run to the benefit of a Substation Right Holder with respect to the Substation Rights.

14.5 Owner's Right to Direct & Assign Payment. Owner shall have the right to direct and assign any payments of Fees and Royalties due Owner under this Easement upon providing written notice to Developer, or to any assignee or Grantee of Developer, at least sixty (60) days before any such payment is due. Such notice shall be on a form provided by Developer upon request by Owner, and shall include (i) the name of any assignee(s) of Owner, (ii) the address(es) of any assignee(s), (iii) the percentage amounts in which such payments are to be made, if there are multiple assignees, and (iv) a completed and signed IRS Form W-9 or other applicable tax form from the assignee(s) ("Payment Instructions"). The Payment Instructions shall be effective as of the date specified in the notice, and shall remain in effect until Owner delivers new written Payment Instructions to Developer. During such time as the Payment Instructions are effective, Developer's payments made pursuant to such Payment Instructions shall be deemed to be in full compliance with this Easement.

15. Termination and Abandonment.

15.1 Termination by Developer. Subject to Section 16 below, but notwithstanding any other provisions of this Easement, Developer shall have the right at any time to terminate this Easement and quitclaim and surrender to Owner all of Developer's right, title and interest in and to Owner's Property by executing and delivering to Owner, or placing on record, a form of release or quitclaim and surrendering to Owner all of Owner's Property and terminating this Easement, provided, however, Developer shall be obligated to remove all Improvements and restore Owner's Property as required by Section 17.2 prior to the termination of the Easement. At any time during the Development Period, Developer may terminate this Easement by delivery of a notice of such termination to Owner not less than three (3) months prior to the termination date designated therein. If Developer exercises its right of termination at any time during the Operations Period, Developer shall pay to Owner on or before the effective date of such termination a sum equal to all amounts accruing to the time of surrender plus an amount equal to the Fees and Minimum

Royalty payable for the then current Operations Year. It is understood that Owner's damages due to early termination of this Easement would be uncertain and difficult to determine. Accordingly, this Section 15.1 is a liquidated damages provision, upon which the Parties have agreed as Owner's sole compensation and remedy in the event of termination by Developer pursuant thereto.

15.2 Abandonment. If Developer abandons Owner's Property, Owner shall have the right to terminate this Easement upon thirty (30) days' prior written notice to Developer. For the purpose of this Section, "abandonment" shall mean cessation of use of all WTGs on the Project(s) for a period of twelve (12) consecutive months; provided, however, such twelve month period shall be tolled for up to an additional twelve months as long as such cessation of use of all WTG's is due to (i) events of Force Majeure and Developer is diligently pursuing the repair and reactivation of such WTG's; (ii) the expiration of all power purchase agreements theretofore served by the Project or Projects and Developer (including for purposes of this Section 15.2 any assignee or Grantee of Developer) is actively pursuing entry into new power purchase agreements for the Project or Projects; or (iii) the loss of all transmission or interconnection capabilities theretofore available to the Project or Projects and Developer is actively pursuing alternate transmission or interconnection capability. Abandonment of Owner's Property by Developer shall constitute a default by Developer hereunder.

16. Default.

16.1 If Developer shall fail to (i) pay any sums due and payable hereunder within ten (10) days from receipt of written notice from Owner that such amounts are due (provided however, interest at the Default Interest Rate shall accrue from and after the date such sum was due until paid), (ii) reinstate the insurance required by Section 12 hereof within fifteen (15) days written notice from Owner that such insurance has been cancelled, or (iii) perform any of the other terms and conditions of this Easement and fail to remedy the same within forty-five (45) days after receipt of written notice from Owner to do so, or, with respect to a curable default, if the failure to perform is such that it cannot reasonably be cured within forty-five (45) days, fail to commence cure within forty-five (45) days and prosecute such cure with reasonable diligence to completion thereafter, then Developer shall be in default hereunder and Owner shall have the following remedies which shall not be exclusive but cumulative and in addition to any remedies now or later available to Owner at law or in equity:

16.1.1 Owner may continue this Easement in effect as long as Owner does not terminate Developer's rights of use, and Owner shall have the right to collect all sums due pursuant to Section 5, plus accrued interest at the Default Interest Rate.

16.1.2 Owner may cure any default by Developer after Developer's cure period has expired. If Owner at any time by reason of Developer's default, pays any sum or does any act that requires the payment of any sum, the sum paid by Owner shall be due immediately from Developer to Owner, together with interest at the Default Interest Rate.

16.1.3 Subject to the requirement for notice and right to cure set forth above, Owner may terminate Developer's right to use Owner's Property upon written notice to Developer. No act by Owner other than the giving of such notice to Developer shall terminate this Easement.

The appointment of a receiver on Owner's initiative to protect Owner's interest under this Easement shall not constitute a termination of Developer's right of use of Owner's Property.

(a) Upon termination, and subject to Owner's compliance with the requirements of applicable laws, Owner has the right to recover from Developer:

(i) The amount of the unpaid Fees and/or Royalties due and owing to Owner as of the date of termination;

(ii) The value, at the time of the award, of the unpaid Fees and Royalties that would have been earned after the date of termination of the Easement until the time of award;

(b) Owner shall not terminate this Easement by reason of the nonpayment of Fees or Royalties if Developer in good faith disputes the amount of Fees or Royalties claimed by Owner and if, within the period of cure set forth in Section 16.1 above, Developer pays to Owner the undisputed portion of such Fees or Royalties, provided that any award in favor of Owner shall include interest on the amount of unpaid Fees or Royalties at an annual rate equal to the Prime Rate plus two (2) percent, simple interest. Owner shall have all rights available to Owner under law and this Easement to dispute any unpaid Fees or Royalties.

(c) Notwithstanding the above, Developer may at any time surrender Owner's Property to Owner pursuant to Section 15 which surrender shall stop the accruing of unpaid Fees, Royalties and other damages under this Section 16.1.

17. Surrender and Restoration. *FUND*

17.1 Surrender. Upon any termination, surrender, or expiration of this Easement, Developer shall remove all of Developer's Improvements from Owner's Property and shall peaceably deliver up to Owner full use of Owner's Property, and other rights granted by this Easement, and shall execute, at Owner's request, any and all documents needed to record or evidence such termination with the appropriate governmental agency of the State of South Dakota.

17.2 Restoration. Prior to any termination, surrender or expiration of this Easement Developer shall restore, to the extent required by any applicable ordinance of Hughes County, State of South Dakota, the subsurface of Owner's Property, but in any event Developer shall restore such subsurface as is reasonably practicable to its original condition as of the Effective Date to a depth of four (4) feet below the surface of Owner's Property. In addition, Developer shall restore the surface of Owner's Property as is reasonably practicable to its original condition as the same existed as of the Effective Date and shall pay for any losses (including Crop/Forage Damage Compensation) and repair any damage, to the extent reasonably practicable, to Owner's Property as a result of any removal of Developer's Improvements under this Section.

17.3 Restoration Fund. Upon the commencement of the eleventh (11th) year of the Operations Period, Developer shall establish a fund ("Restoration Fund") at a federally chartered bank to secure the obligations of Developer under Section 17.2. Upon written request by Owner, Developer shall provide to Owner contact and account information for said federally chartered bank. Developer shall contribute the estimated cost of meeting Developer's restoration obligations

for each of the properties in the Project in which Owner's Property is a part, including the obligations to Owner set forth in Section 17.2, net of any estimated salvage value of Developer's equipment, facilities and Improvements located on each of the Project properties in which Owner's Property is a part ("Net Restoration Amount"); provided that the Net Restoration Amount shall be re-set every seven (7) years after it is initially set, based on new estimates of the cost of removal and salvage value of Developer's equipment, facilities and Improvements located on the Project properties in which Owner's Property is a part. Notwithstanding anything to the contrary, Developer shall have no obligation to establish or maintain the Restoration Fund if (i) Developer is a regulated public utility, (ii) Developer has a senior unsecured and uncredit-enhanced long term debt rating from Standard & Poor's of at least BBB- (or its equivalent) or from Moody's of at least Baa 3 (or its equivalent), or (iii) a governmental authority requires Developer to provide security for removal or decommissioning of the WTGs on the properties in the Project in which Owner's Property is a part. If Developer fails to complete its restoration obligations pursuant to Section 17.2, Owner shall have the right to demand payment of such amounts in the Restoration Fund for the purpose of performing such restoration obligations itself.

18. Condemnation.

18.1 Complete Taking. If, at any time, any authority having the power of eminent domain shall condemn all or substantially all of Owner's Property, or the Project thereon, for any public use or otherwise, then the interests and obligations of Developer under this Easement in or affecting Owner's Property shall cease and terminate upon the earlier of (i) the date that the condemning authority takes physical possession of Owner's Property or the Project thereon, (ii) the date that Developer is, in its sole judgment, no longer able or permitted to operate the Project on Owner's Property in a commercially viable manner, or (iii) the date of the condemnation judgment. Developer shall continue to pay all amounts payable hereunder to Owner until the earlier of such dates, at which time Owner and Developer shall be relieved of any and all further obligations and conditions to each other under this Easement.

18.2 Partial Taking. If, at any time during the Easement Term, any authority having the power of eminent domain shall condemn one or more, but not all, of the WTGs, any Interconnection Facilities, and/or any portion of the Improvements or Owner's Property, then the interest and obligations of Developer under this Easement as to those WTGs, Interconnection Facilities and/or any portion of the Improvements or Owner's Property so taken shall cease and terminate upon the earlier of (i) the date that the condemning authority takes physical possession of such WTGs, Interconnection Facilities and/or any portion of the Improvements or Owner's Property, (ii) the date that Developer is, in its sole judgment, no longer able or permitted to operate the Project on Owner's Property, or any portion thereof, in a commercially viable manner, or (iii) the date of the condemnation judgment, and, unless this Easement is terminated as hereinafter provided, this Easement shall continue in full force and effect as to the remainder of the WTGs, Interconnection Facilities, Improvements and Owner's Property. If the remainder of the WTGs, Interconnection Facilities and/or any portion of the Improvements or Owner's Property, is or becomes insufficient or unsuitable for Developer's purposes hereunder, then Developer shall have the right to terminate this Easement as to the portion of Owner's Property to which Developer continues to hold the rights, at which time Owner and Developer shall be relieved of any further obligations and duties to each other under this Easement, except for those indemnities and

obligations which, by their nature, are intended to survive the termination or expiration of this Easement.

18.3 Apportionment, Distribution of Award. On any taking covered by Section 18.1 or 18.2 above, all sums, including damages and interest, awarded shall be paid as follows:

18.3.1 Any portion of the award awarded by the court on account of any cost or loss that Developer may sustain in the removal and relocation of Developer's Improvements, to Developer;

18.3.2 Any portion of the award awarded by the court for Developer's anticipated or lost revenues or profits, to Developer;

18.3.3 Any portion of the award awarded by the court for Owner's lost revenues to Owner;

18.3.4 Any portion of the award awarded by the court for the taking of the real property constituting Owner's Property to Owner;

18.3.5 All remaining amounts of the award, to Owner or Developer consistent with South Dakota law.

19. Certain Protective Covenants.

19.1 Interference.

19.1.1 During the Easement Term, Owner covenants and agrees that neither it nor Owner's Agents will (i) materially interfere with or prohibit the free and complete use and enjoyment by Developer of its rights granted by this Easement; (ii) take any action that may materially interfere with the availability, accessibility, flow, frequency, or direction of air and wind over and above Owner's Property; (iii) take any action that may in any way materially interfere with the transmission of electric, electromagnetic or other forms of energy to or from Owner's Property; or (iv) take any action that may materially impair Developer's access to Owner's Property for the purposes specified in this Easement or materially impair Developer's access to any or all of the Improvements, where "materially" shall mean, among other things, any act or acts cumulatively that would violate Section 3.11 or that could impair the generation and transmission of electrical energy from any Project or Projects constructed on Owner's Property. Owner shall be permitted to conduct farming, ranching, grazing, hunting, fishing and other agricultural uses reasonably compatible with and which do not unreasonably infringe upon Developer's exercise of the rights granted hereunder.

19.1.2 During the Easement Term, Developer covenants and agrees that neither it nor Developer's Agents will take any action that may materially impair Owner's access to Owner's Property, including over any roads or lanes located on Owner's Property that are shared with Developer ("Access Roads") for the purposes of exercising rights reserved to Owner under this Easement. This Section 19.1.2 shall not apply to the installation, construction, operation, or use of (i) Developer's WTGs and related Improvements, (ii) roads which have the sole purpose of serving Developer's WTGs and related Improvements (and which shall not be construed to be Access

Roads), or (iii) other activities by Developer that are permitted under the terms of this Easement. Owner agrees to pay for all damages caused to any Access Roads as a result of the Owner's use thereof not attributed to normal day to day wear and tear.

19.2 Quiet Enjoyment. As long as Developer observes the terms and conditions of this Easement, Owner warrants that Developer shall peaceably use and enjoy Owner's Property, and any and all other rights granted by this Easement for the entire Easement Term without hindrance or interruption by Owner or any other person or persons lawfully or equitably claiming by, through or under Owner except as expressly provided in this Easement.

19.3 Warranty of Title to Lands. Owner hereby warrants with respect to Owner's Property that (i) Owner has good and marketable fee simple title to Owner's Property, (ii) Owner, previous to the time of execution of this Easement, has not granted a similar easement on Owner's Property, or any part thereof, under any easement agreement or other instrument that is currently in effect, and (iii) the interest in land created hereby with respect to Owner's Property is free from any prior liens, encumbrances, leases, mortgages or deeds of trust granted, made, encumbering or suffered by Owner or Owner's Property, or any person claiming under Owner, except for any such liens, encumbrances, leases, mortgages or deeds of trust that are of public record or that are disclosed to Developer by Owner prior to the Effective Date of this Easement. With respect to any prior liens, mortgages or deeds of trust affecting Owner's Property, Owner hereby agrees to cooperate with Developer and use Owner's good faith efforts, at no cost to Owner, to obtain any Subordination, Non-Disturbance & Attornment Agreements ("SNDA"), in form and substance reasonably acceptable to Developer, that Developer may request or require from any third party that owns or holds a lien, mortgage or deed of trust affecting Owner's Property, whether recorded or unrecorded.

19.4 Observance of Laws and Covenants. Developer shall use Owner's Property granted by this Easement only for the purposes stated herein and shall conduct all of its operations on Owner's Property in a lawful manner after obtaining all necessary permits and government approvals. Developer will carry out its responsibilities and exercise any rights which it possesses under this Easement in a manner which is consistent with all applicable laws, rules, ordinances, orders and regulations of governmental agencies.

20. Consent to Mortgage.

20.1 Disclosure and Consent. The disclosure in the following sentence is given pursuant to South Dakota Statutes Chapter 43, Section 13-17. Developer or any Grantee may from time to time, without the prior written consent of Owner, encumber Developer's or Grantee's interest in this Easement and the rights granted hereunder by one or more Mortgages, provided that any Mortgage and all rights acquired under it shall be subject to each and all of the covenants, conditions and restrictions stated in this Easement and to all rights and interests of Owner. Developer or Grantee shall, upon written request of Owner, promptly deliver a true copy of any such Mortgage to Owner. Without limiting the generality of the foregoing nothing contained in such Mortgages shall release or be deemed to relieve Developer from full and faithful observance and performance of the terms, covenants and conditions herein contained to be observed and performed by Developer or from any liability for the non-observance or non-performance of any

of the terms and conditions hereof, nor be deemed to constitute a waiver of any rights of Owner hereunder, except as expressly provided for herein.

20.2 Assignment. Notwithstanding any other provisions of this Easement, Developer may assign this Easement and the rights granted hereunder without Owner's consent to one or more Mortgagees in connection with financing (including refinancing) of the Project, the WTGs, or other Improvements, and the development of Owner's Property.

20.3 Statement by Owner. At the request of Developer or a Mortgagee, Owner (a) shall execute, acknowledge and deliver to such Developer or Mortgagee, a written statement declaring: (i) either that the Easement is unmodified and in full force and effect, or the manner in which the Easement had been modified and whether the Easement as so modified is in full force and effect; (ii) the dates to which Developer's monetary obligations hereunder have been paid in advance; (iii) whether Developer is or is not then in default hereunder; and (iv) whether any past defaults have been fully cured, and (b) enter into an estoppel and consent agreement recognizing the rights of the Mortgagees of Developer as may be reasonably requested by Mortgagees of Developer.

20.4 Statement by Developer. At the request of Owner, Developer shall execute, acknowledge and deliver to Owner a written statement declaring: (i) either that this Easement is unmodified and whether the Easement as so modified is in full force and effect; (ii) whether the Owner is or is not then in default hereunder; and (iii) whether any past defaults of Owner have been fully cured.

21. Protection of Mortgagee. Any Mortgagee of any interest of Developer hereunder shall for so long as its Mortgage is in existence and until the lien thereof has been extinguished be entitled to the following protection:

21.1 No Amendment. Owner shall not agree to any amendment, mutual termination or modification or accept any surrender of this Easement, nor shall any such amendment, termination, modification or surrender be effective, without the written consent of the Mortgagee.

21.2 Right to Cure; Notice of Default. Mortgagee shall be entitled to remedy any default under this Easement in the manner and on the same terms as granted to Developer. Notwithstanding any default by Developer under this Easement, Owner shall have no right to terminate this Easement unless and until (a) Developer or any Mortgagee shall have failed to cure such default pursuant to the provisions set forth in Section 16, and (b) following the expiration of all applicable cure periods in Section 16, Owner shall then have given Mortgagee(s) a second written notice of Developer's default and failure to cure, affording Mortgagee(s) an opportunity to cure such default within an additional period of time equal to the applicable cure period specified in Section 16 and Mortgagee(s) shall have failed to effect the cure of such default within such additional period.

21.3 Right to Perform. Mortgagee shall have the right at any time to pay any Fees and/or Royalties due hereunder and to perform or cause to be performed any other obligation of Developer at or within the time such payment or performance is required under this Easement. Nothing in this Easement shall be construed to obligate Mortgagee to cure any default of Developer.

21.4 Foreclosure. If Developer's "First Mortgagee" (meaning the Mortgagee that recorded first in time) becomes the assignee of this Easement by means of foreclosure or transfer in lieu thereof, such First Mortgagee shall be liable under this Easement only for the period First Mortgagee remains a Developer hereunder, provided that any subsequent assignee or Developer shall assume and agree to be bound by all the terms and conditions of this Easement.

21.5 Mortgagee's Right to a New Easement. If this Easement shall terminate prior to the expiration of the Easement Term for any reason, including without limitation by operation of law or because of a failure to cure a default pursuant to Section 16, Owner shall enter into a new Easement in recordable form with the Mortgagee that holds the most senior lien against Developer's estate and demands such new Easement within thirty (30) days following receipt of Owner's notice. Such new Easement shall contain the same terms and provisions as this Easement. Owner's obligation to enter into a new Easement as provided herein is conditioned upon the cure of any and all defaults under this Easement other than defaults, if any, that are unique to the defaulting Developer which cannot be cured by the payment of money or the acts of the curing Mortgagee.

21.6 Assignment Following Foreclosure or Termination. In the event (i) that any Mortgagee acquires the Developer's estate hereunder following judicial foreclosure of, or exercise of the power of sale contained in, any Mortgage or by a transfer in lieu thereof; or (ii) any Mortgagee enters into a new Easement, such Mortgagee shall have the right to assign or transfer this Easement or any such new Easement, one time only, to any person or entity without Owner's consent, provided notice of such assignment is given to Owner. The liability of such Mortgagee under this Easement or any such new Easement shall cease upon the assignment, provided that the assignee agrees to perform each and every obligation of the Developer under this Easement or such new Easement and that there is no default under this Easement or any such new Easement. The right of such Mortgagee to assign this Easement or any such new Easement as provided herein is conditioned upon the cure of any and all defaults under this Easement as of the time of such assignment.

21.7 No Merger. In the event Developer acquires fee title ownership of Owner's Property, there shall be no merger of the estate created by this Easement with the fee title interest in Owner's Property without the prior written consent of all Mortgagees.

21.8 Subsequent Apportionment Not Terminable. Any subsequent easement or apportionment by Developer pursuant to Section 14 hereof shall not be terminable by Owner because of a breach of this Easement unless (i) all Mortgagees shall have received notice of such breach and have failed to cure such breach pursuant to this Section 21, and (ii) Grantees or Mortgagees, shall have received notice of such breach and have failed to cure such breach pursuant to Section 14.3.

22. Further Amendments. Owner and Developer shall cooperate in including in this Easement by suitable amendment from time to time any provision which may reasonably be requested by a proposed Mortgagee; provided, however, that such amendment does not impair any of Owner's rights under this Easement or increase the burdens or obligations of Owner hereunder.

23. Notice.

23.1 Writing. All notices given or permitted to be given hereunder shall be in writing; provided, however, that no writing other than the check or other instrument representing the Fee or Royalty payment itself need accompany the payment of the Fees or Royalties.

23.2 Delivery. Notice is considered given either (a) when delivered in person to the recipient named below, or (b) three (3) business days after deposit in the United States mail in a sealed envelope or container, postage and postal charges prepaid, addressed by name and addressed to the party or person intended as follows:

Notice to Owner:

(Insert Owner info here)

Telephone No.: _____

Notice to Developer:

Triple H Wind Project, LLC
3760 State St., Ste. 200
Santa Barbara, CA 93105
Facsimile No.: (805) 569-6190
Attention: Derek M. Harding

23.3 Change of Recipient or Address. Either party may, by notice given at any time or from time to time, require subsequent notices to be given to another individual person, whether a party or an officer or representative, or to a different address, or both. Notices given before actual receipt of notice of change shall not be invalidated by the change.

24. Non-Responsibility.

24.1 Owner shall not be responsible for any loss, liability, claim, or demand for property damage, property loss, or personal injury, including but not limited to death arising out of any injury or damage caused by or resulting from any act or omission of Developer in connection with Developer's use of Owner's Property.

24.2 Developer shall not be responsible for any loss, liability, claim or demand for property damage, property loss, or personal injury, including but not limited to death, arising out of any injury or damage caused by or resulting from any act or omission of Owner in connection with Owner's use of Owner's Property.

25. Expenses of Enforcement. If any party hereto brings any legal action or proceeding to interpret or enforce any of the terms, covenants or conditions of this Easement, the prevailing party shall be entitled to recover from the other party or parties thereto reimbursement for all reasonable expenses, costs and attorneys' fees incurred in connection therewith.

WINNING PARTY FORCES LOSING PARTY TO PAY FEES

26. **Further Assurance.** The parties hereto shall at all times hereafter execute any documents and do any further acts which may be necessary or desirable to carry out the purposes of this Easement and to give full force and effect to each and all of the provisions thereof.

27. **Cooperation.** Owner shall fully support and cooperate with Developer in the conduct of its Operations and in otherwise giving effect to the purpose and intent of this Easement, including, without limitation, in Developer's efforts to obtain from any governmental authority or any other person or entity any environmental impact review, permit, entitlement, approval, authorization or other rights necessary or convenient in connection with their Operations or proposed Operations; and Owner shall promptly upon request, execute, and, if appropriate, cause to be acknowledged and recorded, any map, application, document or instrument (including, without limitation any variance or setback waiver) that is reasonably requested by Developer or such transferee in connection therewith. Without limiting the generality of the foregoing, in connection with any application by Developer for a governmental permit, approval, authorization, entitlement or other consent, Owner agrees (a) if requested by Developer to support such application by filing a letter with the appropriate governmental authority in a form reasonably satisfactory to Developer, (b) to support Developer's position in regard to any requirement or condition of such permit, approval, authorization, entitlement or consent, including, without limitation, in regard to bonding or security requirements or amount, mitigation, environmental impacts or monitoring (provided such position is consistent with Developer's obligations under this Easement), and (c) not to oppose, in any way, whether directly or indirectly, any such application or approval at any administrative, judicial or legislative level.

28. **Approvals and Consents Generally.** Whenever in this Easement the approval or consent of either Party is required or contemplated, unless otherwise specified, such approval or consent shall not be unreasonably withheld, conditioned or delayed, nor shall it be conditioned upon the payment of money not otherwise due hereunder.

29. **Amendments.** This Easement shall not be amended or modified in any way except by an instrument signed by Owner and Developer and consented to by Mortgagee, if any.

30. **Severability.** If any term or provision of this Easement, or the application thereof to any person or circumstance shall, to any extent, be determined by judicial order or decision to be invalid or unenforceable, the remainder of this Easement or the application of such term or provision to persons or circumstances other than those as to which it is held to be invalid or unenforceable shall not be affected thereby, and each term and provision of this Easement shall be valid and shall be enforced to the fullest extent permitted by law.

31. **Governing Law.** This Easement shall be governed by the laws of the State of South Dakota. Any suit arising from its provisions shall be filed in any State or Federal Court within the State of South Dakota having jurisdiction and which is a proper venue in the matter, except as otherwise provided in Section 3.6 of this Easement.

32. **Section Headings.** The section headings herein are inserted only for convenience of reference and shall in no way define, limit or describe the scope or intent of any provision of this Easement.

33. **Entire Agreement.** This Easement shall constitute the entire understanding and agreement between the Parties with respect to the subject matter of this Easement, and supersedes all other prior or contemporaneous writings and understandings.

34. **Memorandum of Easement.** Owner and Developer agree to execute a memorandum of this Easement, substantially in the form attached as **Exhibit B** hereto, and to record same upon the request of either Party. Upon the expiration of the Easement Term or earlier termination of this Easement, Developer shall record a release of the Easement in the public records of Hughes County, South Dakota.

35. **Condition of Property.** Owner makes the following warranties and representations concerning the condition of Owner's Property as of the time of the execution of this Easement:

35.1 **Physical Condition of Demised Premises.** Owner knows of no physical conditions of Owner's Property which Owner has reason to believe would prevent or significantly restrict Developer's development of Owner's Property for the purposes specified in **Section 3** hereof or which could, with the passage of time, or the giving of notice, constitute a violation of any governmental law, ordinance, order, rule or regulation. Developer has made its own investigations of the physical conditions of Owner's Property including but not limited to the wind conditions on Owner's Property and is not relying on any statements or representations of Owner with respect thereto and, subject to the foregoing representation, hereby accepts Owner's Property in its "AS-IS, WHERE-IS" condition.

35.2 **Legal Restrictions Affecting Demised Premises.** Without having made any specific investigation thereof, and without undertaking to do so, Owner knows of no law, regulation, ordinance or order of any local, state or federal governmental authority which would prohibit or significantly restrict Developer's development of Owner's Property pursuant to **Section 3** hereof. Developer has made its own investigations of all laws, regulations, ordinances and orders of any local, state or federal governmental authority affecting Developer's development of Owner's Property.

36. **Survival of Covenants.** Notwithstanding any other provision of this Easement to the contrary, any termination of this Easement pursuant to the terms hereof shall not relieve either party from any liabilities, obligations or indemnities arising prior to the effective date of such termination.

37. **Time of Essence.** Time is of the essence as to each provision of this Easement.

38. **No Waiver.** No waiver by either party of any provision of this Easement shall be deemed to be a waiver of any other provision hereof or of any subsequent breach by the other party. The delay or failure by a Party to enforce any obligation, right or default under this Easement shall not constitute a waiver of that obligation, right or default, or a waiver of the ability to enforce the same obligation, right or default in the future.

39. **Counterparts.** This Easement may be executed in counterparts as duplicate originals, each of which shall be deemed an original, and all of which together shall constitute a single instrument.

LINDA EVANS, J.D. - JUNE 14, 2011
GOVERNMENT

EXCUSES THEM OF OBLIGATION

40. **Force Majeure.** Notwithstanding any other provision of this Easement, Developer's obligations under this Easement (exclusive of payments of Fees and/or Royalties) shall be suspended and excused, and the Easement Term (except for the expiration date), and any other time periods set forth herein shall continue and be extended for a like period of time, (a) while Developer is hindered or prevented, in whole or in part, from (i) conducting Operations or (ii) complying with any term, covenant, condition or provision of this Easement, by: strikes, lockouts or other labor disturbances; delays in transportation; inability to secure labor or materials in the open market; acts of God or the elements, including without limitation, fire, flood, washout, perils at sea, lightning, earthquake or accidents; conditions arising out or attributable to acts of war, civil disturbances or riots; acts or failures to act of Owner; the effects of any law, statute, decree, ordinance, rule or regulation; the failure of any governmental authority to issue any permit, entitlement, approval or authorization within a reasonable period of time after an application for the same has been submitted; or any other matter or condition beyond the reasonable control of Developer, whether or not similar to the matters or conditions herein specifically enumerated, and (b) while litigation contesting all or any portion of the right, title and interest of Owner in Owner's Property and/or Developer under this Easement shall be pending and not finally determined.

41. **Authority.** The signatories hereto warrant that each has the authority to execute this Easement on behalf of Owner and Developer, respectively, under this Easement and that each of said entities has executed this Easement in accordance with its governing documents.

42. **Wind Access Agreement.** In order to maximize the total area of Owner's Property as to which wind power development is authorized by local ordinances, Owner and Developer each agree to enter into agreements with each other and to seek such agreements with other contiguous or adjacent property owners, as the case may be, to provide (i) for a waiver of any setbacks from property lines for WTG installation provided by local ordinances, and (ii) to permit the encroachment during the Easement Term of wind turbine blades over property lines; provided, however, that Developer or such other party benefiting from such agreement shall bear all costs and otherwise be responsible for obtaining such agreements with the other contiguous or adjacent property owners. Such agreements shall be in the form, if any, required by local government(s) and shall be limited to the two purposes specified in this Section.

THERE IS NO SEPARATE FROM PROPERTY LINES
- EXCEPT RESIDENCE

43. **Ownership of Improvements.** The Improvements shall not be deemed to be permanent fixtures (even if permanently affixed to Owner's Property) and shall be and remain the sole property of Developer, except as otherwise provided in this Section 43. Without limiting the generality of the foregoing, Owner hereby waives any statutory or common law lien that it might otherwise have in or to the Improvements or any part thereof and agrees that, notwithstanding the occurrence of an event of default under the Easement beyond all applicable notice and cure periods (including those granted to Mortgagee), Mortgagee (or its designee) or Developer shall remove the Improvements from Owner's Property. Within the thirty (30) day period after receipt by Mortgagee or Developer of a notice that the Easement has been terminated prior to the expiration date (or such longer time as may be reasonably necessary to remove the Improvements from Owner's Property), Mortgagee or Developer shall remove the Improvements from Owner's Property. In the event either Developer or Mortgagee fails to remove the Improvements from Owner's Property as set forth in this Easement, then, in addition to all other rights and remedies at law or in equity available to Owner, Owner may, in Owner's sole discretion, accept ownership of such Improvements and upon Developer's receipt of written notice of such intent from Owner, the

Improvements shall be deemed transferred to Owner and shall thereafter be deemed a part of Owner's Property and neither Developer nor Mortgagee shall thereafter have any further ownership interest in such Improvements.

44. **Confidentiality.** Owner and Developer each mutually agree to hold and maintain the terms of this Easement in the strictest confidence, except that Developer may disclose the terms of this Easement, as needed, to its lenders, accountants, attorneys, proposed investors, and proposed assignees. Owner agrees to hold and maintain in the strictest confidence, and shall require its principals, officers, employees, representatives, and agents (if any) to hold and maintain in the strictest confidence, for the sole benefit of Developer, any financial information, books, records, computer printouts, product design, information regarding Developer, or an affiliate thereof, and any information regarding Operations on Owner's Property or any other lands or projects (collectively, "Confidential Information"), whether disclosed by Developer or an affiliate of thereof or discovered by Owner, unless such Confidential Information either (a) is in the public domain by reason of prior publication through no act or omission of Owner or its principals, officers, employees, representatives or agents, or (b) was already known to Owner at the time of disclosure and which Owner is free to use or disclose without breach of any obligation to any person or entity. Without limiting the generality of the foregoing, Owner shall not use any such Confidential Information for its own benefit, publish or otherwise disclose such Confidential Information to others, or permit the use of such Confidential Information by others for their benefit or to the detriment of Developer. Notwithstanding the foregoing, preliminary or proposed terms of this Easement and negotiations regarding the same were not and are not required to be held confidential, pursuant to South Dakota Statutes Chapter 43, Section 13-20.5. Owner confirms that Developer has not required Owner to maintain the confidentiality of such preliminary or proposed terms (except for Developer's trade secrets or competitive business plans) discussed or negotiated prior to the execution of this Easement.

45. **No Partnership.** Nothing contained in this Easement shall be deemed or construed by the parties or by any third person to create the relationship of principal and agent, partnership, joint venture or any other association between Owner and Developer, other than the relationship of Owner and Developer.

46. **Brokerage Commissions.** Owner and Developer represent to the other that such Party has not incurred, directly or indirectly, any liability on behalf of the other Party for the payment by the other Party of any real estate brokerage commission, finder's fee or other compensation to any agent, broker or finder in connection with this Easement. Owner and Developer shall indemnify, defend and hold the other Party harmless from and against any claim for any brokerage commissions, finder's fees or other compensation claimed to be due and owing by reason of the indemnifying Party's activities.

47. **Limitations.** Neither Owner nor Developer shall be liable to the other (or to any person claiming by or through the other), for any special, indirect, incidental, punitive (except in connection with any fraud or willful misconduct of a party), or consequential damages, including lost profits or loss of business, arising out of or in any manner connected with the performance or non-performance of this Easement.

48. Successors and Assigns. This Easement, and all of the easements, rights, options, and restrictions granted herein, shall burden Owner's Property and shall run with the land. Owner may not assign this Easement except to an assignee that has acquired an ownership interest in Owner's Property; and any such new owner must accept and agree to be bound by all the terms and conditions of this Easement before having any rights or remedies as the Owner hereunder. References in this Easement to "Owner" shall be deemed to include any party that acquires an ownership interest in Owner's Property (or any portion thereof), and such party agrees that he or she has notice of the terms and conditions of this Easement, that this Easement burdens and runs with the land, and that they are bound by all of the terms and conditions of this Easement. No transfer or conveyance of any present or future fee title ownership interest in Owner's Property shall be binding on Developer, and Developer will have no obligation to make payments under the terms of this Easement, unless and until such Owner, or Owner's heirs, transferees, successors or assigns, provides Developer with (a) notice of any such transfer or conveyance, which notice shall include any and all recorded instruments or documents and other information necessary in the opinion of Developer to establish a complete chain of record title from Owner, and (b) an IRS tax Form W-9, or other applicable tax form, executed by any new owner (including the new owner's social security number, tax identification number or employer identification number, as applicable), provided said new owner is to become a payee under the Easement. Upon receiving an executed tax Form W-9 or other applicable tax form from any new fee title owner, Developer shall make payment to Owner pursuant to Section 5 of all amounts due and owing to Owner, including any unpaid amount that accrued during any period of suspension of Developer's payment obligations pursuant to this Section 48. This Easement shall inure to the benefit of and be binding upon Owner and Developer and, to the extent provided in any assignment or other transfer under Section 14 hereof, any assignee or subtenant, and their respective heirs, transferees, successors and assigns, and all persons claiming under them. References to "Developer" in this Easement shall be deemed to include transferees, successors, assignees and subtenants, which hold a direct ownership interest in this Easement and actually are exercising rights under this Easement to the extent consistent with such interest.

49. Favored Owners. Developer hereby represents and warrants that the amounts payable to Owner under Section 5 are not less than any corresponding amounts to which any other owner of land within the Project is entitled under the terms of such owner's agreement with Developer. Owner's sole remedy for any breach of the warranty given in this Section 49 shall be the payment to Owner by Developer of the difference between the agreed payments to the other owner and the amounts payable under Section 5 hereof.

[Signatures on following page.]

IN WITNESS WHEREOF, the Parties hereto have executed this Easement for Wind Energy Development as of the day and year first set forth above.

DEVELOPER:

OWNER:

TRIPLE H WIND PROJECT, LLC, a Delaware
limited liability company

By: Infinity Power Partners, LLC, a Delaware
limited liability company
Its: Sole Member

By: _____
Name:
Its: Owner

By: _____
Name: Matt T. Riley
Its: Manager

By: _____
Name:
Its: Owner

By: _____
Name:
Its: Owner

EXHIBIT A

DESCRIPTION OF OWNER'S PROPERTY

Real property situated in Hughes County, South Dakota described as follows:

Subject to all conveyances, restrictions or reservations of record, if any.

EXHIBIT B

FORM OF MEMORANDUM OF EASEMENT FOR WIND ENERGY DEVELOPMENT

[Follows this Page]

(Space Above this Line for Recorder's Use Only)

PREPARED BY, AND
WHEN RECORDED, RETURN TO:

Triple H Wind Project, LLC
3760 State St., Ste. 200
Santa Barbara, CA 93105
Attn: Land Acquisition Dept.

MEMORANDUM OF EASEMENT FOR WIND ENERGY DEVELOPMENT

THIS MEMORANDUM OF EASEMENT FOR WIND ENERGY DEVELOPMENT (this "Memorandum") is made as of the ____ day of _____, 20__ (the "Effective Date") by and between _____ ("Owner"), whose addresses _____, and TRIPLE H WIND PROJECT, LLC, a Delaware limited liability company ("Developer"), whose address is stated above. Each of Owner and Developer is sometimes referred to individually as a "Party" and collectively as the "Parties."

RECITALS

A. Owner and Developer are parties to that certain Easement for Wind Energy Development dated as of the Effective Date (the "Easement"), whereby Owner demised and granted an exclusive easement, *in gross*, and right-of-way unto Developer, and Developer took an interest through an Easement from Owner on, over and across that certain real property located in Hughes County, South Dakota, as more particularly described on Exhibit A attached hereto and incorporated herein by this reference ("Owner's Property").

B. The Parties desire to execute and record this Memorandum for the purpose of putting all persons on notice of Developer's right, title and interest in and to Owner's Property under the Easement.

C. Capitalized terms used but not otherwise defined in this Memorandum shall have the meanings assigned to them in the Easement.

NOW, THEREFORE, in consideration of the mutual promises set forth in the Easement and this Memorandum, and of other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Owner and Developer agree as follows:

1. Purpose and Scope of Easement. The Easement grants to Developer an exclusive easement, in gross, for wind resource assessment and analysis, wind energy conversion, for the collection and transmission of electric power, and certain rights and easements for related and incidental purposes and activities. Owner shall have no ownership or other interest in any windpower facilities installed on the Owner's Property by Developer, and Developer may remove any or all such windpower facilities at any time.

Among other rights and restrictions in the Easement, is the following restriction: Any obstruction to the free flow of the wind by Owner or persons other than Developer or any transferee or assignee of Developer or persons claiming through or under Developer or any transferee or assignee of Developer is prohibited throughout the entire area of Owner's Property, which shall consist horizontally three hundred and sixty degrees (360°) from any point where any Windpower Facilities are or may be located at any time or from time to time (each such location referred to as a "Site") and for a distance from each Site to the boundaries of Owner's Property, together vertically through all space located above the surface of Owner's Property, that is, one hundred eighty degrees (180°) or such greater number or numbers of degrees as may be necessary to extend from each point on and along a line drawn along the surface from each point along the exterior boundary of Owner's Property through each Site to each point and on and along such line to the opposite exterior boundary of Owner's Property. Trees, structures and improvements located on Owner's Property as of the Effective Date of this Easement shall be allowed to remain and Developer may not require their removal. After the Effective Date of this Easement, Owner may not place or plant any trees, structures or improvements on Owner's Property exceeding thirty (30) feet in height that may, in Developer's sole judgment, impede or interfere with the flow of wind to any Site or the Windpower Facilities, unless Owner has received prior written approval from Developer for any such trees, structures or improvements.

2. Term. The Easement Term commenced on the Effective Date and shall continue for fifty (50) years thereafter, unless earlier terminated or extended in accordance with the terms and conditions of the Easement.

3. Interpretation. The terms, conditions and covenants of the Easement are incorporated herein by reference as though fully set forth in this Memorandum. This Memorandum does not supersede, modify, amend or otherwise change the terms, conditions or covenants of the Easement, and this Memorandum shall not be used in interpreting the terms, conditions or covenants of the Easement. The purpose of this Memorandum is to give public notice of the existence of the Easement. The terms and conditions of the Easement are incorporated by reference into this Memorandum as if set forth fully herein at length. In the event of any inconsistency between this Memorandum and the terms and conditions of the Easement, the Easement shall prevail. The Easement contains a full description of the real property encumbered by the Easement and the easements and other rights granted therein, which terms burden the Owner's Property and run with the land. All of the terms and conditions under which the Easement is granted or may be terminated are included within the Easement.

4. Counterparts. This Memorandum may be executed in counterparts and such counterparts shall, when taken together, constitute one and the same agreement.

[Signatures on following pages]

[Signatures continued from preceding page]

OWNER:

By: _____

Printed Name:

Its: Owner

STATE OF _____)
) ss
COUNTY OF _____)

On _____, 20__ before me, _____
(Name, Title of Officer, Notary Public), personally appeared _____
personally known to me or proved to me on the basis of satisfactory evidence, to be the person
whose name is subscribed to the within instrument and acknowledged to me that he executed the
same in his authorized capacity and that by his signature on the instrument the person, or the entity
upon behalf of which the person acted, executed the instrument.

Notary Public

[Signatures continued on following page]

EXHIBIT A

DESCRIPTION OF OWNER'S PROPERTY

Real property situated in Hughes County, South Dakota described as follows:

Subject to all conveyances, restrictions or reservations of record, if any.

EXHIBIT C
TO EASEMENT FOR WIND ENERGY DEVELOPMENT

**Owner's Consent to Disclosure and Release of Conservation
Reserve Program Information and Data**

Pursuant to the terms and conditions of that certain unrecorded Easement for Wind Energy Development ("Easement") entered into by and between _____ ("Owner"), and Triple H Wind Project, LLC, a Delaware limited liability company ("Developer") on _____, 20__, whereby Owner demised and granted an exclusive easement, in gross, and right-of-way unto Developer, and Developer took an interest through an easement from Owner on, over and across certain real property owned by Owner ("Owner's Property"), described below, for the production, collection and transmission of wind generated energy, Owner consents to the Farm Service Agency's ("FSA") disclosure and release to Developer of any and all Conservation Reserve Program ("CRP") information and data, in print format, digital format or otherwise, regarding or related to Owner's Property, including, without limitation, Owner's CRP contract terms and the FSA's digital CRP mapping data, at any time as Developer may reasonably request from Owner or the FSA, in Developer's sole discretion, throughout the Easement Term.

Owner's Property is located in Hughes County, South Dakota, and is described as follows:

OWNER:

By: _____
Name: _____
Its: Owner

By: _____
Name: _____
Its: Owner

By: _____
Name: _____
Its: Owner

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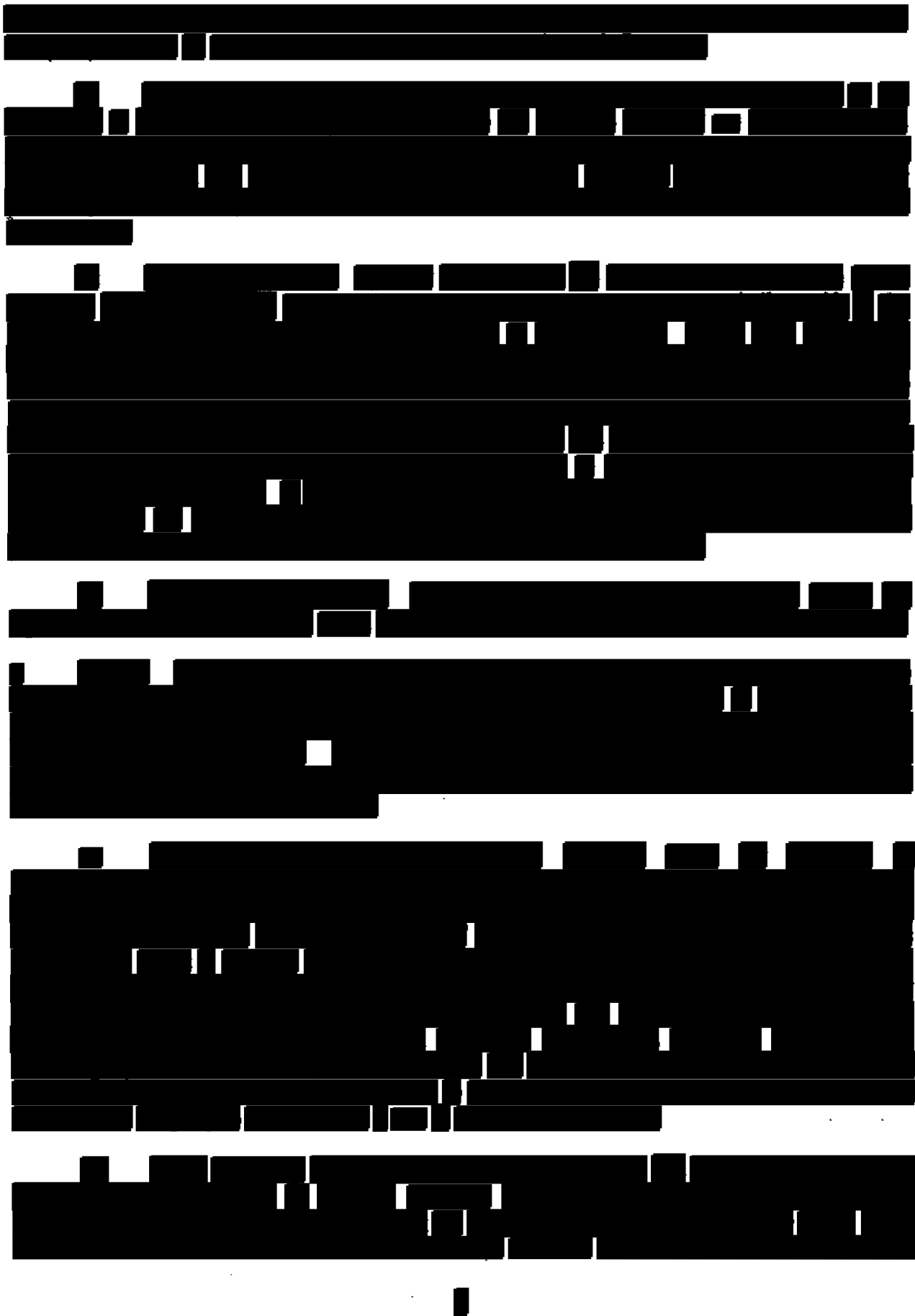
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