BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. EL18-003

IN THE MATTER OF THE APPLICATION BY DAKOTAT RANGE I, LLC AND DAKOTA RANGE II, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT AND CODINGTON COUNTY, SOUTH DAKOTA, FOR DAKOTA RANGE WIND PROJECT

Direct Testimony of Tom Kirschenmann
On Behalf of the Staff of the South Dakota Public Utilities Commission
May 4, 2018

Q: State your name.

A: Tom Kirschenmann

Q: State your employer.

A: State of South Dakota, Department of Game, Fish, and Parks

Q: State the program for which you work.

A: Division of Wildlife, Terrestrial Resource Section

Q: State the program roles and your specific job with the department.

A: The role of the Terrestrial Resources section is to study, evaluate, and assist in the management of all wildlife and associated habitats. Management includes game and non-game wildlife populations, habitat management on public lands and technical assistance and habitat development on private lands, population and habitat inventory, and environmental review of local and landscape projects. As the Deputy Director of the Wildlife Division and Chief of the Terrestrial Resources Section, I oversee and am involved with wildlife management and research, as well as habitat management consisting of the department's public lands and private lands programs.

Q: Explain the range of duties you perform.

A: Duties include leading the Terrestrial Resources section that includes three program administrators (Wildlife, Habitat, Wildlife Damage) and 23 wildlife biologists; coordinate and assist with the Division of Wildlife's Operations at four administrative regions; oversee wildlife research, management, and the establishment of hunting seasons for game species; oversee private lands habitat programs; coordinate environmental review evaluations and responses related to terrestrial issues with department staff; serve as the Department's liaison for several state and federal agencies; and represent the Department on state and national committees.

Q: On whose behalf was this testimony prepared?

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

Q: What role does the Department of Game, Fish and Parks have in the permitting process of a wind energy development project?

A: Game, Fish and Parks has no regulatory authority when it comes to permitting wind energy development projects. The agency's role is to consult with developers and provide recommendations and suggestions on how to minimize or remove potential impacts to wildlife and associated habitats or provide available information to make informed decisions as related to natural resources.

Q: Have you reviewed the Application and attachments? How else did you learn details around the proposed project?

A: Yes, relevant sections of the application and attachments and also discussed project details with GFP biologists who had more direct communications with the developer.

Q: Did the GF&P provide comments and recommendations to Dakota Range about the project area? Please identify who provided those comments and provide a brief summary of them.

A: Yes, Silka Kempema, Wildlife Biologist, provided initial comments in July of 2015. During this initial consultation, information and concerns were shared with the applicant. This consultation continued with conference calls, emails, and review of reports and draft documents associated with the proposed project.

A summary of those consultations include suggestions on the types, timing and number of surveys for grassland birds (songbirds and grouse), survey recommendations for raptors, placement of turbines and associated infrastructure considering the avoidance of untilled native prairie and large contiguous blocks of grasslands and to focus on disturbed lands such as fields currently cultivated, avoidance of activities that will fragment contiguous blocks of grasslands, avoidance of wetland

basins or areas of high concentrations of wetlands, pre-construction surveys for bat use and habitats plus post-construction mortality surveys.

Q: Do you agree with the comments and recommendations provided to Dakota Range by Ms. Kempema? If not, please explain.

A: Yes. These are typical discussion topics and recommendations our Department would share with wind power companies to identify, minimize, or reduce impacts to wildlife and wildlife habitats, especially those projects that are proposed in grassland and wetland habitats.

Q: Based on the information provided in the Application, in your opinion did Dakota Range utilize the proper studies and wildlife surveys necessary to identify potential impacts to the terrestrial environment?

A: Consultation with wildlife agencies early in the application process included the recommendation of several types of wildlife surveys to understand the potential impacts and issues that may occur in the project area and were carried out. It is recommended to carry out post-construction mortality monitoring for at least two years.

Q: **What are the potential impacts to wildlife as a result of the construction of a wind project?**

A: Direct; birds and bats can be killed by turbines due to direct strikes. Indirect; some species may be displaced from otherwise suitable habitat around turbines and roads. A research project on the effects of wind energy on breeding grassland bird densities in North and South Dakota showed seven of nine species of grassland birds had reduced densities around wind turbines over time (Shaffer and Buhl 2016).

Q: What potential impacts to wildlife habitat can result from a wind project?

A: Permanent loss; habitat is permanently converted to turbine pads, roads or buildings. This is often a small percent of the total project acreage (area define by wind easements or otherwise defined project boundary). Temporary loss; habitat is disturbed for a time during construction (e.g. widened roads, crane paths) but is restored. Fragmentation; habitat fragmentation is the division of a block of habitat into smaller, and at times into isolated patches. Habitat fragmentation can decrease the overall value of the remaining habitat.

Q: Can you suggest methods to address temporary and permanent changes to habitat?

A: Temporary impacts to habitat resulting from construction activities likely can be reclaimed by restoring impacted areas by grading and reseeding. Disturbed areas should be restored using native seed sources to reduce

the introduction of new or discourage encroachment of already present exotic and/or invasive species.

For those areas that are permanently changed, lost grassland or wetland acres could be addressed through consideration of mitigation options. Disturbed areas again should be restored using native seed sources to reduce the introduction of new or discourage encroachment of already present exotic and/or invasive species. It would also be recommended that if lost acres are replaced to carry out these replacement activities in the closest possible proximity of the project.

Q: Are there any other impacts besides temporary and permanent habitat impacts that are likely to occur as a result of the project?

A: Indirect habitat impacts are also a consideration. Potential indirect impacts created by wind turbines and associated infrastructure raise concerns with habitat fragmentation and potential displacement, especially with regards to breeding grassland and wetland species. Research into the effects of wind energy on habitat avoidance has shown that some species will not use grassland or wetland habitat within a certain distance of a wind turbine (Loesch et al. 2013, Shaffer and Buhl 2016).

Q: **Did GFP have any wildlife or habitat concerns regarding the proposed Dakota Range? If yes, what are they?**

A: Yes. The area of primary interest is the potential impacts to the various grassland habitats and associated wildlife.

Q: **Did GFP provide any recommendations to avoid wildlife and habitat impacts from Dakota Range? If yes, what were they?**

A: Yes. The primary recommendation was to site turbines and associated infrastructure in cropland or to utilize existing infrastructure and avoid siting turbines in grasslands. Other types of recommendations offered were the utilization of a 1-mile buffer around prairie grouse leks and post-construction surveys for bat and bird mortality which could be used in assisting with operational adjustments in the future.

Q: Are there different types of grasslands?

A: Yes.

Q: Please describe the following: native prairie, hayland, pasture, CRP, and cropland.

A: Grasslands are areas that contain plants species such as graminoids and are commonly used for grazing or set aside for conservation purposes. They can also be areas which are planted to a mixture of grasses and legumes for livestock grazing or feed. Native prairie is grassland upon which the soil has not undergone a mechanical disturbance associated with agriculture or any other type of development. Hayland is grassland

that is managed by frequent mowing and often contains non-native plant species either intentionally or by encroachment. Pasture is grassland that may contain non-native plant species either intentionally or by encroachment and is managed by through grazing. In some instances, hayland and pasture could be native prairie; in other situations, hayland and pasture in particular could be land once cultivated and restored to grassland habitat. Conservation Reserve Program acres (CRP) is grassland that occurs on land that was once tilled and used for crop production and has now been seeded to herbaceous cover to address soil loss, water quality, and provide wildlife habitat. Cropland could be described as agricultural lands cultivated and used to grow crops such as corn, soybeans, small grains, and others.

Q: **Are there any areas of native prairie in the proposed project?**

A: Yes. Spatial analysis conducted by Bauman et al. (2016) has identified potentially undisturbed lands [PUDL] within the proposed project boundary. This is one of the best available spatial data sets representing the location of untilled native grasslands. The applicant also identified within the application an estimated 2,953 acres of untilled grassland within the project area.

Q: Do grasslands other than native prairie have conservation value?

A: Yes. Given the loss of native prairie, working grasslands like pasture, hayland, and conservation grassland plantings serve as surrogates for native grasslands.

Q: To your knowledge, are there grazed grasslands in the project area?

A: Yes.

Q: Do grazed grasslands have any conservation value and what is the impact to grassland wildlife?

A: All grasslands have a conservation value, including those managed through grazing. Grassland birds require a diversity of grassland types and structure to complete life-cycle requirements. Studies have shown that grassland birds respond primarily not to variation in plant species composition but to the structure that these plants provide. Grassland birds have evolved with a gradation of grazing intensities. Grassland wildlife diversity can be maximized by creating a heterogeneous landscape comprised of short, medium and tall vegetation structures. Grazing (haying and burning) management can provide this variation in vegetative structure. Changes in land management and annual precipitation levels can alter plant species composition and vegetation structure of grassland within a short timeframe.

Q: One of the GF&P's recommendations was that efforts should be made to avoid placement of turbines and new roads in grasslands, especially untilled native prairie. Based on the information in the Application and the proposed turbine layout, did Dakota Range demonstrate efforts to address this recommendation? Please explain.

A: From reviewing the available maps, resources, and other information available there were efforts to avoid placement of turbines on untilled native prairie. It appears that multiple turbines are being planned in cultivated land (disturbed) which from a wildlife perspective is a positive siting approach. Some turbines will likely be placed on other types of grassland habitats (hay and pasture) within the project area. Avoidance of all grassland habitat will be challenging in this part of the state and in the project area as a high proportion of the total area is some type of grassland/herbaceous habitat.

Q: One of GF&P's concerns around wind farm development is the fragmentation of contiguous blocks of grasslands. Why is fragmentation a concern?

A: Fragmentation results in the direct loss of habitat and diminishes the value of remaining habitat. Habitat fragmentation is the division of large contiguous blocks of habitat into smaller, and in some instances isolated patches. Identification of contiguous blocks of habitat, especially in

predominantly non-habitat landscapes is an important component of grassland and wetland bird conservation.

Q: **Are there any areas of contiguous grassland habitat in the proposed project?**

A: Yes. The northeastern portion of the proposed project area has the highest level of contiguous blocks of grassland habitat.

Q: Based on the information available does the GF&P have concerns over the placement of turbines and roads in contiguous blocks of grassland?

A: Based on reviewing available information, fragmentation of grassland habitats were avoided/minimized in some of the project area through the proposed layout of the infrastructure of the wind farm. This is a result of primarily utilizing tilled agricultural fields for turbine locations. There are other locations of the project area which the placement of service roads to turbines will likely create some level of fragmentation of larger grassland blocks (comprised of different grassland cover types: hay, pasture, etc.). Based on the location of the project area and the existing land-use, it will be challenging not to create some additional fragmentation of grassland habitat, and in some situations larger contiguous blocks comprised of different grassland cover types.

Q. Does the state or GF&P have specific mitigation recommendations that will minimize or compensate potential impacts from wind energy development if they cannot be avoided?

A. At the current time South Dakota does not have a state mitigation policy that can be provided to wind energy developers. However, there are resources available which can provide guidance and suggestions that can be considered as well as self-imposed actions or activities that can minimize natural resource impacts.

Q: What are potential mitigation considerations?

A: Mitigation can take multiple forms and can be accomplished in a multitude of ways. It could be an approach which implements an applied management activity/strategy on impacted lands which elevates these lands to a more productive state or higher ecological state (example – grazing management) to an approach which is more sophisticated and detailed using tools developed to calculate acres of habitat to be restored or created based on impacted acres and other relevant research data (example – decision support tool). Two examples that are available specifically for wind energy projects is a decision support tool based off the research conducted by Loesch et al. (2013) that considers breeding waterfowl and another which focuses on breeding grassland songbirds resulting from research findings of Shaffer and Buhl (2016). As stated earlier South Dakota does not have a state mitigation policy nor does the

state endorse either study and resulting products, however it is worthy of mentioning these tools demonstrating resources available to developers and managers.

Q: Does the GF&P have any thoughts regarding the potential for cumulative impacts the Project may have?

A: As projects are completed and based on location and proximity to other projects, the question of cumulative impacts will become more apparent. Knowing the importance of native prairie tracts and other forms of grassland habitat to several grassland dependent species, continued development on these types of lands could result in reduced or limited habitat value. Placement of turbines in lands currently under cultivation and avoiding where possible the different varieties of grassland and wetland habitats will help minimize potential cumulative impacts.

Our agency will continue to work with wind developers and provide recommendations that we believe will help minimize cumulative impacts. No different than offered to this project, the focus could include, but not limited to, recommendations on avoiding grassland habitats, in particular native prairie remnants, avoidance of high wetland complex areas, maximize the use of existing corridors for infrastructure, and pre and post construction surveys to assess the proposed project area that may assist in operational decisions.

Q: Do any State threatened or endangered species have the potential to be impacted by the wind farm?

A: There is the chance that the state and federal endangered Whooping Crane could occur in the project area. The other state listed species present is the Northern River Otter and there are not likely to be impacts to this species from the proposed wind farm.

Q: Does this conclude your testimony?

A: Yes.

Bauman, P., J. Blastick, C. Grewing, and A. J. Smart. 2014. Quantifying undisturbed land on South Dakota's prairie coteau. SDSU Extension.

Bauman, P., B. L. Carlson, and T. Butler. 2016. Quantifying undisturbed (native) lands in eastern South Dakota:2013. South Dakota State University.

Loesch, C. R., J. A. Walker, R. E. Reynolds, J. S. Gleason, N. D. Niemuth, S. E. Stephens, and M. A. Erickson. 2013. Effect of wind energy development on breeding duck densities in the Prairie Pothole Region. The Journal of Wildlife Management 77:587-598.

Shaffer, J. A., and D. A. Buhl. 2016. Effects of wind-energy facilities on breeding grassland bird distributions. Conservation Biology 30:59-71.

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Education:

Eureka High School, Eureka, SD, 1989
BS: Wildlife and Fisheries Sciences, South Dakota State University, May 1993
MS: Wildlife Management, South Dakota State University, May 1996

Certifications:
Certified Wildlife Biologist, The Wildlife Society, July 2000
Level III Career Development Training, SD GF&P, 2007

Experience:

SOUTH DAKOTA GAME, FISH, AND PARKS, Pierre, SD
Wildlife Division Deputy Director (2016 - present) & Chief of Terrestrial Resources (11/08 - present)
Supervisor: Tony Leif, Director, Division of Wildlife, 605-773-4518

- Serve as the Wildlife Division's Deputy Director to assist with the overall management of the Division.
- Coordinate the management and research of game and non-game species statewide.
- Coordinate the management of the Departments habitat programs, including the private lands programs, public lands management, access programs, terrestrial environmental assessments, and programs related to the federal Farm Bill.
- Oversee a staff that includes a Program Administrator for Wildlife, Habitat and Wildlife Damage programs and 23 biologists.
- Serve as the Department's liaison or representative for several state and federal agencies and associated committees.
- Coordinate with non-government organizations, constituency groups, and agricultural groups on resource management programs, projects, and issues.
- Manage an annual budget of approximately $16M which includes research, direct payments to landowners for habitat, hunting access, and wildlife damage, and contracts to complete surveys, programs, and projects.
- Lead rules promulgation process for respective duties by presenting to the GFP Commission and assisting in writing administrative rules.

SOUTH DAKOTA GAME, FISH, AND PARKS, Pierre, SD
Wildlife Program Administrator, Game Management (12/07 – 11/08)
Supervisor: George Vandel, Assistant Director, Division of Wildlife, retired

- Coordinated the management and research of all game species statewide.
- Coordinated the accumulation and organization of data and regional suggestions in the development of hunting season recommendations.
- Drafted action sheets and present season recommendations to GF&P Commission.
- Assisted with the development and a team member that reviews hunting season applications and the Hunting Handbook.
- Supervised 9 biologists and 1 secretary stationed in five locations across the state.

- Served as department representative on committees (wildlife disease boards and poultry advisory board) and liaison to the SDSU Diagnostic Lab and APHIS Wildlife Services for Avian Influenza monitoring.
- "Press Release" review team member.
- Oversaw the Game Budget, including the contractual research projects with SDSU Wildlife and Fisheries Department and other academic institutions.
- Worked with the media addressing game and related issues, including live interviews, newspaper articles, and the writing of short articles.
- Team member in the development and implementation of the Mentored Hunting Program.
- Presented research and management information at regional meetings, Commission meetings, and to conservation organizations.

SOUTH DAKOTA GAME, FISH, AND PARKS, Huron, SD
Sr. Wildlife Biologist (1/05 – 12/07)
Supervisor: Tony Leif, Director, Division of Wildlife, 605-773-4518

- Oversaw management and research of upland game species statewide.
- Directed internal upland game research, analyses, and reports.
- Part of game staff committee that provided recommendations on all game seasons and license allocations.
- Served as Office Manager at the Huron GF&P District Office: directing day to day activities of Resource Biologist and Secretary within the Upland Game Section.
- Served as field co-leader with waterfowl biologist in the coordination of statewide Avian Influenza (AI) sampling.
- Worked with regional game staff on management, survey, research, and mortality projects.
- Administered the departments Wildlife Partnership Program for two years and provided guidance and direction upon request.
- Assisted with the coordination of meetings and trainings, including serving as chair person of the Prairie Grouse Technical Council (PGTC) meeting in October 2007.
- Served as department representative on several committees such as Midwest Pheasant Study Group, PGTC, Sage Grouse Council, Poultry Advisory Board (AI matters), and the National Wild Turkey Federation Technical Representative.
- Wrote management and scientific reports, as well as magazine and newspaper articles.
- Conducted presentations internally, as well as landowner and sportsmen club meetings.

PHEASANTS FOREVER, INC., St. Paul, MN
Regional Wildlife Biologist
South Dakota & Wyoming (4/00 – 1/05)
Illinois & Indiana (7/95 – 4/00)
Supervisor: Richard Young, VP Field Operations, 877-773-2070

- Established and maintained chapters comprised of grassroots volunteers and guided them in the development of habitat programs, fundraising efforts, and youth programs.
- Worked with chapters to develop wildlife habitat programs designed to fit the needs for both local and regional areas.
- Directed and assisted chapters with annual fund-raising events. Wrote grants to support local and state habitat efforts.
- Built partnerships between Pheasants Forever (both chapters and national) with local, state, and federal conservation agencies. Primary PF representative in developing SD Wildlife Habitat Extension Biologist (WHEB) program with SD GF&P and SD NRCS.
- Developed reporting system, submitted reports to GF&P, NRCS, and PF national, wrote grants, and some supervisory duties related to the WHEB program.
- Served on several state and federal habitat committees (State Technical Committee for both SD and WY, SD CRP sub-committee, WHIP sub-committee for SD and WY, SD School and

Public Lands, Northern Great Plains Joint Venture, Great Lakes and Upper Mississippi Joint Venture, IL Pheasant Fund Committee, IN DNR Gamebird Partnership Committee, IL DNR Conservation Congress).

- Organized and conducted wildlife habitat workshops for chapters, landowners, and other agency personnel.
- Established agenda, budget, and organized annual meeting for subgroup of co-Regional Wildlife Biologists, while serving as Mentor Group Leader.
- Wrote newspaper articles, interviewed for radio and TV shows, conducted presentations, and distributed newsletters.
- Educated volunteers about wildlife biology, habitat, wildlife interactions, and counsel on current, upcoming, and changes to state and federal conservation programs.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Graduate Research Assistant (4/93 - 7/95; graduated 1996)
Supervisor: Dr. Daniel Hubbard, Professor, retired
Graduate Research Project.

- Research involved the comparison of avian and aquatic invertebrate abundances on conventional, organic, and no-till farming systems.
- Efforts included breeding waterfowl pair counts, waterfowl brood counts, wetland bird surveys, upland bird surveys, and aquatic invertebrate sampling.
- Other duties included surveying aquatic plants and collecting soil seed bank samples.
- Prepared bi-annual reports for USDA and EPA.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (3/92 - 8/92)
Supervisor: Diane Granfors, Graduate Research Assistant
Seasonal position.

- Assisted with wood duck study determining brood habitat and survival.
- Built, repaired, and placed wood duck nesting structures.
- Candled eggs, web tagged ducklings, banded hens, placed radio telemetry collars and acquired locations.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (10/90 - 3/91; 10/91 - 3/92)
Supervisor: Todd Bogenschutz, Graduate Research Assistant
Seasonal position.

- Aided on the research study that evaluated corn and sorghum as a winter food source for the ring-neck pheasant.
- Shared duties to feed pen birds on restricted diets.
- Sampled winter food plots.
- Assisted in extracting intestinal organs and taking anatomical measurements and weights.

SOUTH DAKOTA STATE UNIVERSITY; Brookings, SD
Research Technician (5/91 - 8/91)
Supervisor: John Lott, Graduate Research Assistant
Seasonal position.

- Worked on yellow perch food habit study.

- Used various equipment to sample fish and zooplankton. Aged fish and processed stomach contents. Sorted and tabulated zooplankton samples.

THE NATURE CONSERVANCY, Ordway Prairie, Leola, SD
Intern/Preserve Worker (5/90 - 8/90)
Supervisor: Andy Schollett, Preserve Manager
Seasonal position.

- Monitored grazing leases and rotations, conducted brome and prairie plant surveys, spraying of noxious weeds, fencing and general maintenance.

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IN THE MATTER OF THE APPLICATION BY DAKOTA RANGE I, LLC AND DAKOTA RANGE II, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT COUNTY AND CONDINGTON COUNTY, SOUTH DAKOTA, FOR THE DAKOTA RANGE WIND PROJECT

DIRECT TESTIMONY OF PAIGE OLSON
ON BEHALF OF THE COMMISSION STAFF
May 4, 2018

Q. State your name.

A. Paige Olson.

Q. By who are you employed?

A. State of South Dakota.

Q. For what department or program do you work and what is your job title?

A. State Historic Preservation Office (SHPO), Review and Compliance Coordinator.

Q. Please explain the program goals and your role and duties within SHPO.

A. The National Historic Preservation Act of 1966 is the foundation for the preservation work of the South Dakota State Historical Society (SDSHS). The State Historic Preservation Office (SHPO), a program under the SDSHS, is responsible to survey historic properties and maintain an inventory; identify and nominate properties to the National Register of Historic Places; advise and assist federal, state, and local government agencies in fulfilling their preservation responsibilities; provide education and technical assistance in historic preservation; develop local historic preservation programs; consult with federal and state agencies on projects affecting historic properties; and advise and assist with rehabilitation projects involving federal assistance. My specific role is to monitor state permitted and federally funded, licensed or permitted projects to ensure historic properties are taken into consideration. I provide technical

analyses, reviews and assistance to government agencies to ensure compliance with state and federal guidelines. I serve as the lead over the review and compliance function of SHPO.

Q. On whose behalf was this testimony prepared?

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

Q. State and explain the South Dakota laws that protect archaeological and historic resources in this state.

A. South Dakota Codified Law 1-19A-11.1 - Preservation of historic property – Procedures. The state or any political subdivision of the state may not undertake any project which will encroach upon, damage or destroy any property included in the State Register of Historic Places or National Register of Historic Places.

Q. Have you reviewed the Application and Dakota Range's testimony?

A. I have reviewed the Application and the pre-filed testimony of David Phillips. I have also reviewed the following documents: *Level I Cultural Resources Records Search and Regulatory Review for the Dakota Range I Wind Project (Revised Boundary)* (Appendix M)*, Cultural Resources Monitoring and Management Plan for the Dakota Range I Wind Project* (CRMMP) (Appendix N)*,* and *Level III Archeological Inventory of the Dakota Range I Wind Project Archeological High Probability Areas, Codington and Grant Counties, South Dakota*.

My office also received the report entitled *Reconnaissance Level Architectural Survey of the Dakota Range I Wind, LLC Project, Grant and Codington Counties, South Dakota.* This report was reviewed by Kate Nelson, Restorations Specialist, also from the SHPO.

Q. Has SHPO provided any recommendations to Dakota Range regarding places of historical significance and cultural resources?

A. Yes.

Q. Please describe what those recommendations were.

A. I recommended standard methods for the identification of cultural resources within the project area, which included the following:

1. An official record search from the Archaeological Research Center, which is the official repository for all archaeological information in South Dakota. The record search provides baseline information about previous archaeological surveys conducted in the project area and cultural resources identified as a result of those surveys.

2. Conduct a Level III Intensive Survey to relocate known cultural resources and identify unrecorded cultural resources in the project area.

3. Analyze the visual effects to architectural resources located within one mile of the project boundaries. The one mile buffer is a standard recommendation made for all wind farm projects given the vertical extent of the

project. This is important to consider when attributes such as viewshed are an important element in the significance of the resource.

4. Contact the Tribal Historic Preservation Officers (THPO) in South Dakota. THPOs and /or designated tribal representatives are a recognized source of information regarding places of religious and cultural significance to them.

Q. Did Dakota Range adequately address those recommendations? If not, please explain.

A. Yes.

Q. Do you agree with Dakota Range's conclusions made in the Application and testimony regarding impacts to places of historical significance and cultural resources? If not, please explain.

A. Yes.

Q. Is SHPO waiting for any additional studies to review? If so, please explain what those studies are and what SHPO will ultimately do with those studies.

A. No.

Q. In your opinion, does the Application and Dakota Range's pre-filed testimony as presented to the Commission contain enough information to

properly understand any potential adverse impacts to places of historical significance and cultural resources? If not, please explain.

A. Through the development of the CRMMP for the Dakota Range I Wind Project, Dakota Range has committed to avoid physical impacts to cultural resources, and coordinate with the SHPO to minimize impacts to resources if complete avoidance is not possible.

However, the issue of direct and indirect impacts to pre-historic or pre-contact cultural resources was not specifically addressed in the information provided to my office. I was not involved in Dakota Range's engagement with the Sisseton Wahpeton Oyate (SWO) to identify cultural resources, and I am not aware of any subsequent findings or recommendations made by SWO. Dakota Range will need to provide the Commission with SWO's findings and recommendations, if available.

Q. If Dakota Range changed any turbine locations from those presented in the preliminary layout could that change any of the conclusions Dakota Range made regarding potential impacts to places of historical significance and cultural resources? Please explain.

A. Dakota Range has committed to reviewing unevaluated areas and complete additional Level III surveys in areas identified as high probability areas in accordance with the CRMMP.

Q. Do you have a recommendation for a permit condition, or conditions, the Commission should consider?

A. 1. Not only are cultural resource sites non-renewable, but no two sites are same. Once a resource is damaged or destroyed the information the resource may contain about the history of South Dakota is gone. Therefore, I recommend the following condition:

> "The Applicant agrees to avoid direct impacts to cultural resources that are unevaluated, eligible for or listed in the National Register of Historic Places (NRHP). When NRHP unevaluated, eligible or listed site cannot be avoided, Applicant shall notify the State Historic Preservation Office (SHPO) and the Commission of the reasons that complete avoidance cannot be achieved in order to coordinate minimization and/or treatment measures."

2. An unanticipated discovery plan is designed to provide step by step guidance when human remains and/or cultural resources are inadvertently discovered during construction activities. On site employees, contractors or subcontractors, who may not be trained in cultural resources, may be the individuals who initiate the plan. Therefore, I recommend the following condition:

> **"**The Applicant agrees to follow the unanticipated discovery plan outlined in the document entitled "Cultural Resources Monitoring and Management Plan for the Dakota Range I Wind Project."

3. Places of religious and cultural significance are often comprised of related locations for which the connections may not be obvious to those outside of the culture that holds them significant. It stands to reason that the appropriate individuals to determine which properties are or are not of religious and cultural significance to American Indian tribes is a representative designed by the tribe. Therefore, I recommend the following condition:

> "The Applicant agrees to consult American Indian tribes in the identification and assessment of the project's impacts to cultural resources that may be of religious and cultural significance to their tribe."

Q. Does this conclude your testimony?

A. Yes.

PAIGE HOSKINSON OLSON
Pierre, SD 57501

Education

1998-2001	Master of Arts, Anthropology University of Montana, Missoula, MT Major: Cultural Resource Management Minor: Archaeology
1989-1995	Bachelor of Arts University of Montana, Missoula, MT Major: History Minor: Political Science
1985-1989	Whitehall High School, Whitehall, MT

Professional Experience

January 2007 - Present — Archaeological Review and Compliance Coordinator, South Dakota State Historical Society - State Historic Preservation Office (SHPO), 900 Governors Drive, Pierre, SD

- Assess impact of projects on historic properties and ensure those properties are taken into consideration during planning and implementation of project in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended and South Dakota's state preservation law, South Dakota Codified Law 1-19A-11.1.
- Assess the eligibility of properties for listing on the National Register of Historic Places in accordance with the criteria developed by the National Park Service.
- Review archaeological survey reports and documentation submitted by federal, state and contracting archaeologist to determine if proper methodology and standards established by state and federal government are met.
- Negotiate with and assist agencies in developing legal agreements to mitigate effects to historic properties, such as memorandums of agreement.
- Negotiate with and assist agencies in developing legal agreements to provide for alternative review and compliance procedures, such as programmatic agreements.
- Provide technical assistance to government and tribal officials, contactors, and the general public concerning federal and state laws.
- Participate in consultation meetings to discuss project effects on historic properties with federal, state and tribal officials.
- Develop effective public information programs about state and federal preservation laws and archaeology.
- Ensure a database of all projects submitted for review is maintained and accurate for reports and future federal funding requests.
- Monitor changes in the interpretation of federal and state rules and regulations.
- Provide work direction and training for review and compliance program staff to ensure project are reviewed in an accurate, consistent and timely manner.
- Supervise student interns and volunteers in various projects.
- Site Manager for Fort Pierre Chouteau National Historic Landmark.
- Prepare and write comprehensive plans to manage cultural resources in South Dakota and update guidelines to ensure historic properties are identified and protected.
- Manage contracts focused on archaeology.
- Coordinate annual Archaeology Camp for twenty school age children.

- Participate in State Hazard Mitigation Group.
- Participated as a member of the Social Cultural Economic Technical Team for the development of the Missouri River Ecosystem Restoration Plan.

June 2002 – January 2007

Historic Archaeologist, South Dakota State Historical Society - State Historic Preservation Office, 900 Governors Drive, Pierre, SD

- Assessed impact of projects on historic properties and ensure those properties are taken into consideration during planning and implementation of project in accordance with Section 106 of the National Historic Preservation Act and South Dakota's state preservation law, South Dakota Codified Law 1-19A-11.1.
- Assessed properties eligibility for listing on the National Register of Historic Places in accordance with criteria established by the National Park Service.
- Reviewed archaeological survey reports and documentation submitted by federal, state and contracting archaeologist to determine if proper methodology and standards established by the state and federal government are met.
- Negotiated with and assisted agencies in developing legal agreements to mitigate effects to historic properties, such as memorandums of agreement.
- Negotiated with and assisted agencies in developing legal agreements to provide for alternative review and compliance procedures, such as programmatic agreements.
- Provided technical assistance to government officials, contactors, and the general public concerning federal and state laws and compliance requirements under Section 106 of the National Historic Preservation Act.
- Maintained a database of all projects submitted for review.
- Supervised student interns in various projects.
- Site Manager for two National Historic Landmarks owned by the state.
- Updated state guidelines for cultural resource surveys and survey reports specifically for Section 106 review and compliance.
- Managed contracts focused on archaeology.
- Coordinated Archaeology/ Preservation Month.

April 2001- June 2002

Historic Preservation Specialist, South Dakota State Historical Society - State Historic Preservation Office
900 Governors Drive, Pierre, SD

- Functioned as West River Coordinator for National and State Register of Historic Places Programs, Certified Local Government program and historic preservation grant program.
- Apply National Register Criteria to make preliminary determinations of eligibility for listing properties on the National Register of Historic Places.
- Prepared and edited in house National and State Register Nominations.
- Surveyed commercial and residential districts to update existing National Register nominations.
- Furnished technical advice and grant management services to local historic preservation organizations and the general public.
- Acted as contact for GIS Technical Advisory Group.
- Used GoeExplorer III for data collection and ArcView/Mapit to create accurate maps.
- Consulted on review and compliance issues under state preservation law.

January 2000 – April 2001

Archival Technician, National Park Service, Grant-Kohrs Ranch National Historic Site, PO Box 790, Deer Lodge, MT

- Functioned as field archaeologist observing ground disturbing activities and making

onsite assessments for work associated with Natural Resource Damage Assessment.

- Acted as liaison between NPS personnel and University of Montana field research crews.
- Worked closely with Natural Resource Management Division to protect cultural and natural resources.
- Oversaw groundwater, soil, vegetation and range management research occurring at the Grant-Kohrs Ranch.
- Provided relevant information to University of Montana field crews to comply with state and federal laws.
- Drafted necessary documents involving Section 106 compliance for the Montana State Historic Preservation Office.
- Attended and represented the Grant-Kohrs Ranch at Natural Resource Damage Assessment meetings.
- Gathered financial information for Natural Resource Damage Assessment cost recovery.
- Maintained Administrative Record for Grant-Kohrs Ranch damage assessment.
- Worked with confidential and sensitive legal material.
- Completed a two-month detail in Atlanta, Georgia working directly with NPS Natural Resource Damage Assessment staff.

January 2000 – May 2001 — Thesis Project, Bureau of Land Management, Fort Missoula Road, Missoula, MT

- Updated Cultural Resource Inventory for abandoned mining town of Coloma.
- Surveyed and recorded approximately 149 structures and features related to mining activities.
- Used GeoExplorer II for data collection to map structures and features.
- Documented current condition of structures and features using appropriate Bureau of Land Management forms and photographs.
- Completed literature search and develop comprehensive history of Coloma.
- Researched and compiled annotated bibliography.
- Supervised documentation of archaeology sites by volunteers.

February 2000 – May 2000 — Intern, Montana State Historic Preservation Office, Helena, MT

- Performed record searches and entered archaeology site data using Oracle databases: Cultural Resource Information System, Cultural Resource Annotated Bibliography System, and Project, Eligibility and Effect Reports System.
- Compiled information to complete narrative and physical descriptions for nomination of historic district.
- Completed National Register of Historic Places nomination for Slayton Mercantile, Lavina, Montana.
- Surveyed and evaluated historic structures located within historic district for nomination as National Historic Landmark.
- Reviewed and prepared site files to be assigned Smithsonian Numbers.

Field Schools and Volunteer Experience

April 2014 — Natural Resource Conservation Service, Pierre Field Office, Pierre, SD

- Assisted NRCS Archaeologist in three archaeological inventories for the placement of pipelines and tanks.
- Inventory included walking transects to identify historic and prehistoric resources.

October 1999 – Bureau of Land Management, Fort Missoula Road, Missoula, MT

November 1999

- Assisted BLM Archaeologist in archaeological inventory for timber sale and land exchange.
- Walked 30 meter transects to identify historic and prehistoric artifacts and features.
- Identified and recorded prehistoric and historic sites

July 1998 — University of Montana Field School, Prehistoric Campsite
Department of Anthropology, Missoula, MT

- Laid out, excavated, and screened soil from excavation units.
- Conducted block style excavations.
- Mapped vertical and horizontal stratigraphy.
- Point plotted artifacts and established vertical provenience.
- Maintained detailed excavation notes.

August 1998 - December 1998 — University of Montana Field School, Historic Structure at Fort Missoula
Department of Anthropology, Missoula, MT

- Laid out, excavated, and screened soil from excavation units.
- Conducted block style excavations.
- Mapped vertical and horizontal stratigraphy.
- Point plotted artifacts and established vertical provenience.
- Maintained detailed excavation notes.

Training

July 2015 — *The Section 106 Advanced Seminar*
Advisory Council on Historic Preservation
Pierre, SD

July 2015 — *Section 106 Essentials*
Advisory Council on Historic Preservation
Pierre, SD

June 2014 — *Working in Indian Country*
Larry D. Keown
Rapid City, SD

May 2014 — *Current Archaeological Prospection Advances for Non-Destructive Investigations in the 21st Century*
National Park Service, Midwest Archeological Center
Aztalan State Park., Aztalan, WI

September 2012 — *Archaeological Damage Investigation and Assessment; Archaeological Violation Investigation Class*
Martin E. McAllister
Pierre, SD

August 2010 — *National Register/ National Historic Landmark Workshop*
National Park Service
Virginia City, NV

June 2008 — *Section 106 Essentials*
Advisory Council on Historic Preservation, Pierre, SD

April 2008	Native American Sensitivity Training Curley Youpee, Russell Eagle Bear and Ben Rhodd Pierre, SD
May 2007	*Identification and Management of Traditional Cultural Places* National Preservation Institute, Claudia Nissley Seattle, WA
February 2006	National Environmental Policy Act (NEPA) Training Federal Highway Administration Pierre, SD
November 2005 - December 2005	Native American Awareness Training Albert White Hat, Dorothy LeBeau, Wayne Evans, and Craig Howe Pierre, SD
August 2005	*Shenandoah-Dives Mill HAER Documentation and Historic Structure Assessment Workshop* San Juan Historical Society Silverton, CO
September 2004	*Section 106: How to Negotiate and Write Agreements* National Preservation Institute, Claudia Nissley Honolulu, HI
September 2004	*Integrating Cultural Resources in NEPA Compliance* National Preservation Institute, Claudia Nissley Honolulu, HI
July 2003	*Archaeological Law Enforcement Class* Archaeological Resource Investigations, Martin McAllister, Wayne Dance and John Fryar Pierre, SD
September 2002	*Section 106 for Practitioners* National Preservation Institute, Tom King Seattle, WA
July 2001	*Introduction to ArcView GIS Version 3.1* Kadrmas, Lee and Jackson Pierre, SD

Publications

A Cultural Site Evaluation Coloma, Montana, 2000. Missoula: University of Montana Press, 2001.

"Creations in Stone: Petroforms in East River SD", South Dakota History. Vol. 35, No. 4 (Winter 2005): 347-362.

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. EL18-003

IN THE MATTER OF THE APPLICATION BY DAKOTA RANGE I, LLC AND DAKOTA RANGE II, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT COUNTY AND CODINGTON COUNTY, SOUTH DAKOTA, FOR THE DAKOTA RANGE WIND PROJECT

Direct Testimony of David Lawrence
On Behalf of the Staff of the South Dakota Public Utilities Commission
May 4, 2018

Q: State your name and occupation.

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

Q: State your business address.

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

Q: By whom are you currently employed?

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

Q: Please state your educational and professional background.

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

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

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

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

A: I am a State-Certified General Appraiser.

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

A: I have a wide range of appraisal experience and geographical competency across South Dakota and neighboring states including property types such as residential, commercial, ranch and farm. I've been fortunate in my appraisal career to have worked across the diverse market areas of South Dakota, including East and West River. Most of my appraisal experience is in right-of-way, linear and energy projects. I have provided appraisals for right-of-way acquisitions, condemnation, and damage property cases. I have managed the appraisal process for several recent energy and large-scale linear projects in South Dakota including Keystone L.P., Keystone XL and the Dakota Access pipelines. As part of my practice, I provide appraisal services for damaged property and diminution value studies. These assignments have ranged from measuring the impacts of a high-voltage transmission line on residential property values, to analyzing the impacts of the 2011 Missouri River flood on residential and agricultural property values in Union County. In the last nine years, I've completed several studies analyzing the impacts of underground pipelines on agricultural land values in Montana, South Dakota, Minnesota, and Nebraska. I have extensive experience in South Dakota developing damage studies and their relationship to properties values. I've developed South Dakota impact studies on the Keystone Phase I, Keystone XL, NuStar, SDIP, Northern Border, Lewis & Clark, Magellan, Rockies Express, and MDU pipelines. The scope of work for these projects, included sales analysis studies, site impact studies, and highest and best use studies across

South Dakota. My various impact studies have relied upon survey-based research with hundreds of South Dakota market participants impacted by an energy project, and sales research in every county which the projects occupy. My experience with impact studies across the state has given me the competency and knowledge to correctly research and apply the methodology for credible analysis.

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

A: Yes. I have submitted written testimony in Docket 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.

Q: On whose behalf was this testimony prepared?

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

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

A: The purpose of my testimony is to (1) assist the Commission in understanding valuation principles and techniques and how they can be appropriately applied to estimate value impacts from the Dakota Range Wind Project and other wind energy projects in South Dakota and (2) assist the Commission in understanding the information presented by Dakota Range in regards to potential value impacts on South Dakota real property.

Q: Are you aware of any studies that have been conducted in South Dakota that properly support and address the potential impacts of wind farms on real property Value?

A: As of the effective date of my direct testimony, I'm not aware of any study that properly addresses the potential value impacts, if any, on real property in South Dakota from a wind farm, turbine, tower or wind project.

Q: What exhibits have you reviewed in this docket?

A: I have read the documents below for the Dakota Range docket.

-Direct Testimony of Michael MaRous
-Exhibit 1, Market Impact Analysis
-Exhibit 2, Impact of Industrial Wind Turbines on Residential Property Assessments in Ontario 2012
-Exhibit 3, Impact of Industrial Wind Turbines on Residential Property Assessment in Ontario 2016
-Exhibit 4, Effects of Wind Turbines on Property Values in Rhode Island
-Exhibit 5, The Effects of Wind Turbines on Property Values in Ontario
-Exhibit 6, Relationship between Wind Turbines and Residential Property Values in Massachusetts.
-Appendix L to the Application, LBNL Study, The impact of Wind Power Projects on Residential Property Values in the United States

Q: In your opinion, does Dakota Range's valuation expert, Mr. MaRous meet the criteria to be a real property appraiser in South Dakota?

A: Yes. Mr. MaRous has indicated that he has applied for a temporary practice permit with the Appraisal Certification Program for the assignment with Dakota Range. Mr. MaRous' qualifications show extensive appraisal experience with different property types including energy and wind projects, and competency in this type of appraisal work.

Q: In your opinion, do the studies and testimony of the applicant adequately reflect the potential impact to the market value of properties in the vicinity of the proposed Dakota Range project?

A: It is my opinion the studies and testimony presented by Dakota Range provide a good starting point to gauge the potential impacts a wind tower, turbine or wind project can have on real properties values in South Dakota; however, the studies presented have limitations that need to be considered for their applicability to South Dakota.

First, the Market Impact Analysis presents limited market evidence from South Dakota to gauge the potential value impacts a wind project can have on real property values. Only one sale, from White, S.D. is analyzed and is located over four miles from a wind tower. Second, most of the studies (Exhibits 2-6) present statistical analysis of a large, well-defined residential dataset from other market areas that are not necessarily comparable to South Dakota (Ontario, Canada; Rhode Island; Ridgetown, Canada; and Massachusetts). Third, the studies presented as Exhibits 2 & 3, are developed to assist with Canadian assessment valuations for the purpose of taxation, and are not necessarily applicable to South Dakota. Fourth, the studies do not reveal a consistent consensus among the authors about potential impacts of wind towers, turbines, and wind projects on property values:

- Exhibit 2, page 3 of 163, states, "*The 2012 CVA study also found there is no statistically significant impact on sale prices of residential properties in these market areas resulting from proximity to an IWT.*"
- Exhibit 3, page 7 of 39, states, "*MPAC concluded that 2016 Current Value Assessments of properties located within proximity of an IWT are assessed at their current value and are equitably assessed when compared to the assessments of properties that are not in proximity to IWTs*."
- Exhibit 4, page 4 of 29, states, "*Our principle finding is that the best estimate is that there is no price effect, and we can say with 90% level of confidence if there is a price effect, it is roughly 5.2% or less*. *Thus, while we cannot conclude for sure that there is no effect on housing prices, there is no statistical evidence of a large, adverse effect.*"
- Exhibit 4, page 7 of 29, states, "*Fortunately, better studies have been carried out recently. Heintzelman and Tuttle (2012) examine impacts of wind farms in three counties of Upstate New York using over 11,000 transactions and a specification that treats distance as a single continuous variable. They do find some significant price effects from proximity, though they are not consistent across counties. Their results imply that a newly built wind farm within a half mile of a property can decrease value by 8-35%.*"
- Exhibit 5, pages 26-27 of 42, states, "*while the results indicate a general lack of significantly negative effects across the properties examined in this study, this does not preclude any negative effects from occurring on individual properties. In fact, a recent appraiser's report on the impacts of*

Melancthon's wind turbines (Lansink 2012) found that the values of five specific properties in close proximity to turbines declined by up to 59%. While the set of properties examined in this study may not be representative of all open-market sales in close proximity to the turbines …., it provides evidence that values of specific properties may be negatively impacted, which supports the claims made by a number of local residents."

- Exhibit 6, page 3 of 49, states "*The results of this study do not support the claim that wind turbines affect nearby home prices*."
- Appendix L, page 209 of 222, states, "*Across all model specifications, we find no statistical evidence that home prices near wind turbines were affected in either the post-construction or post-announcement/preconstruction periods*. *Therefore, if effects do exist, either the average impacts are relatively small (within the margin of error in the models) and/or sporadic (impacting only a small subset of homes)."*

What is particularly noteworthy about the studies cited above, is that some of the conclusions indicate there could well be a potential value impact to properties near a wind project. In light of each of the above studies, a reader could conclude the issue is unanswered. That is why it is essential to have credible market evidence from South Dakota to determine the effects of wind projects on real property values.

Q: Is it is your opinion the studies presented by Dakota Range are directly applicable to South Dakota?

A: It is my opinion that any conclusions presented about the potential impacts of wind projects in South Dakota need to be supported by credible market evidence from South Dakota, in addition to evidence from other applicable markets. The information provided by Dakota Range lacks research to answer questions about potential value impacts in South Dakota.

Q: Can you explain some of the limitations to a statistical study that uses the hedonic regression method that have been presented by Dakota Range?

A: To estimate the value of real property using the hedonic mathematical equation, property characteristics or independent variables are identified that contribute to market value such as view, shape, topography, location, and utility. By including proximity or view of a wind energy project or wind tower as a variable in the regression, the appraiser can better estimate the negative or positive impact the wind energy project or tower will have on the value of the property. The hedonic analysis has been an accepted methodology in the appraisal profession for years; however, it has limitations. One significant weakness of hedonic analysis was pointed out in the winter 2012 edition of the Appraisal Journal. In the article James Chalmers, PhD states, "(hedonic analysis)…*does not rule out the possibility that some individual properties are significantly affected nor provide any insight into the conditions shared by those individual properties that make them vulnerable to transmission line impacts."* In my experience with damages studies, I have found

Chalmers' statement to be valid in analyzing properties affected by an energy project. To truly gauge a project's impact, the methodology needs to address more than just a mathematical analysis of a large data set from different market areas around the United States. The study needs to address a case-by-case analysis with sale evidence from specific and surrounding market areas that would be applicable to the impacted properties.

Q: What is the methodology that is required for a case-by-case study beyond a hedonic method?

A: The general approach of this study would identify and examine a population of arm's length transactions involving properties within a wind energy project area in South Dakota. The general steps for the study would be: 1) Identify properties affected by a South Dakota wind energy project since the project first became operational; 2) Organize the properties into common ownership and property types; 3) Research the chain of title for each property ownership from the first operational date of the wind project to current effective date of the study; 4) Study the title history to identify transfers in ownership that appear to be arm's length and qualify per South Dakota's definition of fair market value; 5) Conduct site inspections and interview buyers and sellers to establish the sales qualify as arm's length transactions, and if so, verify transaction details and gather information on terms of the sales, participant motivation and value effect of the wind project, if any; 6) For each sale, collect and verify data on comparable property sales not within the proximity of a wind energy project for comparison (unaffected sales); 7)

Conduct survey-based research with market participants as an alternative to statistical price analysis to estimate the potential impacts from a wind energy property; 8) Analyze the survey-based research, interview data and the market data to reach a conclusion in regards to the effect of the wind energy project or wind tower on the value of the applicable property types; 9) Prepare a work file of the research to support the analyses and conclusions; 10) Prepare a study report summarizing the research and findings. The study would include individual sale analysis for properties types affected by wind energy projects, including farm and ranch, residential, and rural residential.

Q: Did Dakota Range provide this type of study with the Market Impact Analysis prepared by Mr. MaRous, as described above?

A: While the Market Impact Analysis provides additional insight with case-by-case examples in Iowa, Minnesota and Illinois, the studies do not provide a qualified market sale from South Dakota that has been impacted by a wind project, tower or turbine. The study does include one example from South Dakota; however, I do not see the reasoning in using a sale that is over four miles from a wind tower as a comparable sale to measure the potential impacts from a wind project. In addition, there seems to be some inconsistencies with the sales data identified in the Market Impact Analysis that raises concerns about the applicability of the research. Some examples of concern are:

1. The sale price is not reported accurately. The Market Impact Analysis lists the 19937 473rd Avenue sale price as $169,500. The Brookings County

records & Brookings County MLS show the 19937 473rd Avenue sale price as $167,500.

2. The Market Impact Analysis does not provide any discussion about the proximity to the high-traffic Interstate corridor along the west property boundary.
3. The Market Analysis lists 5705 Rathum Loop as having a crawl space. Brookings County shows 5705 Rathum Loop as having a finished ¾ basement with 800 square feet of finish in the lower level.
4. 19937 473rd Avenue is located on a gravel road and in rural setting 13 miles north of Brookings. 5705 Rathum Loop is on the east edge of Brookings on a solid surface road and would be considered within the City of Brookings real estate market.

If the facts upon which the conclusions are based are inaccurate, the conclusions may be inaccurate. A Market Impact Analysis requires a stronger sales population from South Dakota to provide credible market evidence.

Q: Did you fact-check the data used in the other paired sales provided in the Market Impact Analysis similar to Brookings County No. 1 sale? (Freeborn No.1, Handcock No.1, Macon No. 1, & Logan No.1)

A: No, I did not. However, I did find the statement on page 22 of Exhibit 1, for the Macon County residential paired sale, most peculiar: *"The broker stated that the turbine being installed proximate to the property is a possible reason for the quick*

sale at a higher price, so having a turbine close to this property potentially had a positive effect on the sale."

Q: Do you agree with the relevancy of relying on interviews with South Dakota Assessors to support impacts on real property values near wind towers, turbines or wind projects?

A: I work with many assessors across South Dakota daily, and they are great at what they do, which is assessing mass real property for the purpose of fair and equal taxation. Assessors are not focused on assessing the individual market values of properties nor the influences a property can have from different market conditions. For example, agricultural property for assessment in South Dakota is valued based on a soil productivity rating. This rating or multiplier is applied to the property's production capabilities to determine the assessed value. The assessment process does not consider conditions that could impact individual value, whether positive or negative, such as a transmission line, wind tower, mineral rights or payments paid to landowners from a wind tower lease. Mass appraisal techniques are used for assessing thousands of properties in the county for taxation, not determining if an individual property shows a negative or positive influence from an externality. Assessor interviews are not substantively valid in determining the negative impacts from a wind project.

Q: Do county assessors and credentialed appraisers have the same educational and experience requirements in South Dakota?

A: No, they do not. Assessors are not credentialed appraisers in South Dakota. County assessors are part of the state's Property Tax Division which is responsible for overseeing the tax system. To be hired as a county assessor, there are no qualifications or experience requirements in appraisal. The Department of Revenue does require the county assessor to attend training classes conducted by the state within one year of being hired, but these requirements are completely different from the criteria to become a credentialed appraiser in South Dakota.

Q: What claims did the Applicant make regarding market sales from South Dakota that have been impacted by a wind tower, turbine, or wind project?

A: The Applicant made the following claims regarding market sales in South Dakota:

- Exhibit 1, Market Impact Analysis, Page 11, states "*The only sale found in South Dakota that is located in the general market area of a wind farm, based on data research from the entire state, was a residence within four miles to the Buffalo Ridge Wind Farms in nearby Brookings County.";*
- MaRous Testimony, Page 4, Lines 6 - 12, states "*I reviewed sales transactions in seven northeastern counties in South Dakota to try to identify matched paired sales to use for comparison…. However, of the sales reviewed, only one rural residential property sale was near a wind farm, and that property, located in Brookings County, South Dakota, was nearly four*

miles away from a turbine. As a result, the sale was not close enough to a wind turbine to use in a proximate/not proximate paired sales comparison."; and

- Exhibit 1, Market Impact Analysis, Page 27, states *"I was unable to discover any sales of South Dakota farmland in which the transaction included a wind turbine …"*

Q: Are you aware of any market sales of real property in South Dakota that have sold near a wind tower, turbine or wind project?

A: Yes. Arm's length sales influenced by wind projects do exist in East River South Dakota. In an afternoon, here is what my research assistant and I found for sale evidence in Brookings County. This is not an exhaustive search of the South Dakota counties with wind projects, nor has a complete sales analysis been developed. Our research was limited to using the internet at my office and the Brookings County website as a research tool:

- **Sale BK1** Elkton, S.D. -- 2003 ranch acreage with eight acres. Listing price $218,000. Sale price $183,000. Arm's length sale managed by broker. Encompassed by 14 wind turbines circling the property. Tower #1 1,200 +/- feet to the east. Tower #2 5,000 +/- feet to the northeast. Tower #3 3,800 +/- feet to the north. Tower #4 665 +/- feet to the north. Tower #5 4,300 +/- feet to the northwest. Tower #6 5,000 +/- feet to the northwest. Tower #7 800 +/- feet west. Tower #8 2,700 +/- feet west. Tower #9 4,500 +/- feet southwest. Tower #10 3,500 +/- feet southwest. Tower #11 3,600 +/- feet southeast. Tower #12 750 +/- feet southeast. Tower #13 2,400 +/- feet southeast. Tower #14 4,000 +/- feet southeast.

- **Sale BK2** Toronto, S.D. – 1998 1.5 Story acreage with 10 acres. Purchased for $234,900. Listed for $339,900 six years later after completion of nearby wind project. Reduced listing price to $279,000 after market exposure and

no offers. Final sale price of $235,000. Arm's length sale managed by broker. Encompassed by 16 wind turbines. Tower #1 890 +/- feet northwest. Tower #2 1,700 +/- feet northwest. Tower #3 2,700 +/- feet northwest. Tower #4 3,600 +/- feet northwest. Tower #5 4,600 +/- feet northwest. Tower #6 5,400 +/- feet southwest. Tower #7 4,500 +/- feet southwest. Tower #8 3,800 +/- feet southwest. Tower #9 2,800 +/- feet southwest. Tower #10 2,400 +/- feet south. Tower #11 2,100 +/- feet southeast. Tower #12 2,500 +/- feet southeast. Tower #13 3,600 +/- feet southeast. Tower #14 4,500 +/- feet. Tower #15 5,800 +/- feet southeast. Tower #16 7,000 +/- feet southeast. Sale verification confirmed with Brian Gatzke, Northern Plains Appraisal in Brookings. Interview with seller indicated the sale terms were negatively impacted by the proximity to wind towers. Buyer paid a reduced price because of the proximity of the turbines and negotiated with seller not to sign a wind tower lease on adjacent farmland owned by seller within proximity to the residence. See sale BK2.5.

- **Sale BK2.5** Elkton, S.D. – 16.95 acres of tillable cropland with a soil productivity rating of 86. Sold for $50,000 or $2,950 per acre. 16 wind turbines surround the farmland. No wind turbines located on the property. Tower #1 750 +/- feet northwest. Tower #2 1,600 +/- feet northwest. Tower #3 2,500 +/- feet northwest. Tower #4 3,500 +/- feet northwest. Tower #5 4,500 +/- feet northwest. Tower #6 5,400 +/- feet southwest. Tower #7 4,500 +/- feet southwest. Tower #8 3,750 +/- feet southwest. Tower #9 2,700 +/- feet southwest. Tower #10 2,400 +/- feet south. Tower #11 1,900 +/- feet south. Tower #12 2,300 +/- feet southeast. Tower #13 3,500 +/- feet southeast. Tower #14 4,400 +/- feet. Tower #15 5,700 +/- feet southeast. Tower #16 6,700 +/- feet southeast. Sale verification confirmed with Brian Gatzke, Northern Plains Appraisal in Brookings. Interview with seller indicated they had to cancel wind lease agreement per negotiation with buyer of sale BK2. Arm's length sale managed by broker.

- **Sale BK3** Elkton, S.D. – 1918 Two-story acreage with 14.28 acres. Listing price $189,900. Sale price $175,000. Arm's length sale managed by broker. Surrounded by 17 wind turbines. Tower # 1 2,000 +/- feet north. Tower #2 2,800 +/- feet northwest. Tower #3 3,600 +/- feet northwest. Tower #4 4,200 feet +/- northwest. Tower #5 4,300 +/- feet southwest. Tower #6 3,700 +/- feet southwest. Tower #7 2,700 +/- southwest. Tower #8 2,200 +/- feet southwest. Tower #9 1,500 +/- feet south. Tower #10 1,900 +/- feet southeast. Tower #11 3,400 +/- feet southeast. Tower #12 8,500 +/- southeast. Tower #13 7,400 +/- feet southeast. Tower #14 6,400 +/- feet east. Tower #15 4,000 +/- feet east. Tower #16 2,100 +/- northeast. Tower #17 875 +/- feet northeast.

- **Sale BK4** Toronto, S.D. – 1989 Ranch acreage with 13 acres. Listing price $569,900. Sale price $530,000. Arm's length sale managed by broker. Nine wind turbines located south and east. Tower #1 10,500 +/- feet east.

Tower #2 9,200 +/- feet east. Tower #3 7,700 +/- feet southeast. Tower #4 6,500 +/- feet southeast. Tower #5 5,400 +/- feet southeast. Tower #6 4,100 +/- feet southeast. Tower #7 3,100 +/- feet southeast. Tower #8 2,400 +/- feet southeast. Tower #9 1,800 +/- feet south, southeast.

- **Sale BK5** Elkton, S.D. – 1936 Two-story with 6.95 acres. Purchased for $215,000. Sold four years later for $190,000. $25,000 less than previous purchase price or depreciation of approximately -11.6%. Both sales were advertised and managed by a broker. Four turbines located east, north and west. Tower #1 2,000 +/- feet northeast. Tower #2 3,600 +/- feet north. Tower #3 745 +/- feet west. Tower #4 2,700 +/- feet west.

- **Sale BK6** White, S.D. – 80 acres of productive cropland. Sold at public auction for $340,000 or $4,250 per acre. According to the auction flyer, there were 66.8 tillable acres per FHA maps. Property has a wind energy road easement across property to access turbine located just east of the northeast corner. Road access easement payment of $2,400 per year. There is no wind tower on the property; however, eight turbines surround the farm. Tower #1 200 +/- feet east. Tower #2 2,000 +/- feet northwest. Tower #3 7,900 +/- feet northwest. Tower #4 800 +/- feet west. Tower #5 3,300 +/- feet west. Tower #6 5,000 +/- feet west. Tower #7 4,400 +/- feet southwest. Tower #8 1,300 +/- feet southwest.

- **Sale BK7** Elkton, S.D. – 1992 ranch acreage with 13.35 acres. Sold for $180,000. Thirteen wind turbines surround the property. Tower #1 1,800 +/- feet north. Tower #2 2,500 +/- feet northeast. Tower #3 3,300 +/- feet northeast. Tower #4 4,200 +/- feet northeast. Tower #5 5,200 +/- feet northeast. Tower #6 6,700 +/- feet east. Tower #7 8,500 +/- feet east. Tower #8 7,900 +/- feet southeast. Tower #9 6,000 +/- feet southeast. Tower #10 3,900 +/- feet southeast. Tower #11 3,000 +/- feet southeast. Tower #12 1,700 +/- feet southeast. Tower #13 1,100 +/- feet south. Preliminary review of the Warranty Deed indicates an arm's length sale.

- **Sale BK8** Elkton, S.D. – 158 acres of productive cropland. Sale price $493,750 or $3,125 per acre. Arm's length sale. Seller partitioned two, one-acre tracts with two wind towers from the 160-acre quarter. Seller retained wind energy lease and access rights by easement. Buyer purchased cropland encumbered with two wind towers and access road crossing the north half of property. Fourteen wind turbines surround the property, including two wind turbines directly located within the property boundaries. Tower #1 2,000 +/- feet northeast. Tower #2 3,500 +/- feet northeast. Tower #3 5,300 +/- feet northeast. Tower #4 7,300 +/- feet northeast. Tower #5 5,800 +/- feet east. Tower #6 7,000 +/- feet east. Tower #7 4,400 +/- feet east. Tower #8 2,500 +/- feet southeast. Tower #9 780 +/- feet southeast. Tower #10 6,300 +/- feet southeast. Tower #11

1,500 +/- feet southeast. Tower #12 560 +/- feet south. Tower #13 & #14 are located within the north half of the 160-acre quarter.

- **Sale BK9** Elkton, S.D. – 152 acres of productive cropland. Sale price $958,000 or $6,302 per acre. Arm's length sale. Sale encumbered by two wind turbines with a wind tower lease. Thirteen wind towers surrounding the property. Tower #1 1,500 +/- feet north. Tower #2 1,700 +/- feet northwest. Tower #3 2,500 +/- feet northwest. Tower #4 4,000 +/- feet northwest. Tower #5 2,700 +/- feet west. Tower #6 4,800 +/- feet southwest. Tower #7 770 +/- feet south. Tower #8 3,500 +/- feet south. Tower #9 2,000 +/- feet south. Tower #10 2,900 +/- feet southeast. Tower #11 2,400 +/- feet southeast. Tower #12 2,200 +/- feet northeast. Tower #13 3,400 +/- feet northeast.

- **Sale BK10** Elkton, S.D. – 482 acres of productive cropland and small area of pasture land. Sale price of $1,720,000 or $3,568 per acre. Arm's length sale. Sale included a wind energy lease and wind easement for one tower. Seventeen wind turbines surround the property. Tower #1 2,900 +/- feet northwest. Tower #2 1,900 +/- feet northwest. Tower #3 990 +/- feet north. Tower #4 800 +/- feet north. Tower #5 900 +/- feet north. Tower #6 1,200 +/- feet northeast. Tower #7 1,900 +/- feet northeast. Tower #8 800 +/- feet east. Tower #9 4,500 +/- feet northeast. Tower #10 1,700 +/- feet east. Tower #11 1,600 +/- feet southeast. Tower #12 5,100 +/- feet east. Tower #13 7,100 +/- feet east. Tower #14 5,500 +/- feet southeast. Tower #15 4,200 +/- feet southeast. Tower #16 275 +/- feet south. Tower #17 1,500 +/- feet west.

- **Sale BK11** Elkton, S.D. – 224 acres of productive cropland. Sale price $1,428,137 or $6,375 per acre. Arm's length sale. No wind towers within property boundaries; however, ten wind turbines in the vicinity. Tower #1 4,500 +/- feet west. Tower #2 3,200 +/- feet west. Tower #3 2,200 +/- feet southwest. Tower #4 1,700 +/- feet southwest. Tower #5 3,800 +/- feet south. Tower #6 2,100 +/- feet south. Tower #7 3,000 +/- feet southeast. Tower #8 3,500 +/- feet south. Tower #9 4,300 +/- feet south. Tower #10 3,000 +/- feet south.

In addition to using the county website to search sales in Brookings County, I used the internet to research auction listings and below are my findings.

- **Sale BK 12,** Elkton, S.D. – Located just east of the South Dakota/Minnesota border. 161.92 pasture acres currently advertised for upcoming 2018 public auction. 109.30 acres of CRP expiring in fall of 2018. Two wind turbines on the property with annual wind lease payment. Wind lease payments for 2017 at $13,011, 2016 at $12,880, 2015 at $12,438 and 2014 at $12,360.

Two wind and access easements encumber the property. Seven wind towers surround the farm. Tower #1 100 +/- feet west. Tower #2 2,000 +/- feet west. Tower #3 2,900 +/- feet northeast. Tower #4 900 +/- feet east. Tower #5 2,900 +/- feet southeast. Tower #6 1,800 +/- feet south. Tower #7 1,700 +/- feet southwest.

- **Sale JR 13**, Wessington Springs, S.D. – 800 acres of cropland and pasture land. Sold at public auction in four separate tracts. Tracts 1, 2 & 3 sold to one buyer for $1,560,000 or $3,250 per acre. Tracts 1, 2 & 3 included 480 acres with 439 tillable acres. Tract 4 sold to another buyer for $896,000 or $2,800 per acre. Tract 4 included 320 acres of rough pasture. Tract four was encumbered by a wind tower easement and wind tower lease payment. Aerial shows a transmission line crossing from northwest to southeast. 50-year lease terms with 1% increase per year, with 41 years remaining. Broker interview stated tract 4 sold for a premium because of the wind lease payments.

Exhibit_DAL-2 provides an aerial map of the above referenced sales. These sales do not constitute a study to support a conclusion, are in the preliminary stages of development, and require a scope of work as previously described in my testimony. As demonstrated by the research, it seems there is credible market evidence in South Dakota that can answer the questions about the potential impacts of wind projects on South Dakota real property values.

Q: What is your opinion about the potential impacts of a wind project in South Dakota based upon your initial research?

A: The sales I've identified in South Dakota are too limited and unverified to support a conclusion on potential impacts from a wind project. The limited market evidence did raise concerns, as it shows there could be potential issues for residential properties in proximity to a wind project. Also, I find the wind lease payments reported with sale BK12 and JR13 to be a potential benefit to the property because of the income stream. These hypotheses would need to be

supported with further market sale evidence, interviews, verification and research. The point of the sales illustrations isn't an attempt to draw unsupported conclusions from limited research; they are to show that there is market evidence in South Dakota that will answer the questions about potential impacts on property values in the vicinity of a wind project.

Q: Are you suggesting that it would be necessary to conduct a market study to include all operating wind projects in South Dakota?

A: If the commission wants a comprehensive study applicable to all of South Dakota, I recommend the thirteen wind projects be included in the analysis. However, if research identifies a strong set of sales data within a region of South Dakota, it might not be necessary to extend the study to the thirteen operating wind projects in South Dakota.

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

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

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

A: Cost depends on the scope of work agreed to with the client and the wind projects identified for the study. In South Dakota, a comprehensive study of this type would be required to have an extensive level of quality and research that could withstand scrutiny from courts and peer review, as well as assure the public that

due diligence has been done to answer the questions about impacts on property values.

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

A: I had several discussions about this with Staff. Unfortunately, it was impossible to properly conduct a study in the time provided by statute. As I stated previously, it would take six months to complete an accurate study. This would not include the time it would take to contract for services, conduct discovery and do necessary investigation, prepare testimony, and participate in an evidentiary hearing.

Q: Does this conclude your testimony?

A: Yes.

Qualification & Resume
David A. Lawrence MAI SRA AI-RRS SR/WA

4820 E. 57th St. Sioux Falls, SD, 57108
O 605.782.5300 / C 605.376.3781
david@dalappraisal.com

Summary of Experience

David Lawrence is a designated member of the Appraisal Institute and the International Right of Way Association. Real property appraisal experience includes residential, commercial, land development, easement rights, retail, farm, ranch, and linear and infrastructure projects.

Licenses & Certifications

- South Dakota Certified General Real Property Appraiser – Certificate No. 1034
- South Dakota Real Estate Broker Associate – Certificate No. 14125
- Nebraska Certified General Real Property Appraiser – Certificate No. 2018004R
- Minnesota Certified General Real Property Appraiser – Certification No. 40499441

Appraisal and Real Estate Experience

2006 to Present
-Owner and President of DAL Appraisal & Land Services Inc., a real property consulting and valuation firm. Appraisal discipline includes real property with a focus on residential, commercial and agricultural property types.

2008 to 2012
-Real Property Appraiser with William D. Otto Spence Real Estate. Duties include research, development and reporting of appraisal reviews, market impact studies, damage issues and appraisals for Federal Land Acquisitions. (Principle: William D. Otto Spence MAI SR/WA CCIM MS)

2006 to 2015
-Real Property Appraiser with RJ Hobson Agency. Duties include research, development and reporting of residential, agricultural and commercial appraisal reports. (Principle: Bill Hobson, MAI retired 2015)

Education

B.A. Business Administration
Western State Colorado University

Professional Affiliations & Development

- Appraisal Institute SRA Designated Member – North Star Chapter Minneapolis
- Appraisal Institute MAI Designated Member – North Star Chapter Minneapolis
- Appraisal Institute Professional Development Program – Appraisal Litigation
- Appraisal Institute Professional Development Program –Conservation Easements
- Appraisal Institute – Leadership Development & Advisory Council 2014, 2015 & 2016 D.C.
- *Appraisal Institute – Candidate for AI-GRS Designation*
- FHA/HUD Approved Appraiser – FHA Connection ID MJH926
- Appraisal Institute Member – North Star Chapter 2006 to Present
- IRWA – International Right of Way Association Member – 2007 to Present
- IRWA – International Right of Way SR/WA Designated Member
- PAASD – Professional Association of Appraisers of South Dakota Member
- PAASD – Elected Board Member 2008 to Present. President 2014.
- IRWA – Chapter 72 Regional Pipeline Committee – 2012 to 2014
- RASE – Sioux Empire Association of Realtors – Member 2006 to Present
- Realtor Associate – National Association of Realtors – Member 2006 to Present

Professional Education and Development

Pro Ed Professional Education

- Fundamentals of Appraisal
- Sales Comparison Approach for Single Family
- Cost Approach for Single Family
- Income Approach for Small Income Properties
- Uniform Standards of Professional Practice & Ethics
- Residential Report Writing

Appraisal Foundation

- 15 Hour National USPAP
- State Investigator Training Level II
- State Investigator Training Level III
- 2018 USPAP Update Course
- USPAP Instructor Certification Course

Appraisal Institute

- 400G Certified General Highest & Best Use
- 401G Certified General Sales Comparison Approach
- 402G Certified General Cost Approach
- 403G Certified General Income Part I
- 404G Certified General Income Part II
- 405G Certified General Report Writing and Case Studies
- 300GR Real Estate Finance, Statistic, and Valuation Modeling
- Business Practice & Ethics
- Residential Market Analysis & Highest and Best Use

- Residential Report Writing and Case Studies
- Residential Site Valuation & Cost Approach
- Residential Sales Comparison Approach and Income Approaches
- 601RED Advanced Residential Applications and Case Studies Part I
- 604RED Advanced Residential Report Writing Part II
- 806 Introduction to FHA Appraising
- 802 REO Appraisal: Appraisal of Residential Property Foreclosure
- 715GRE Condemnation Appraising: Principles & Applications
- Uniform Appraisal Standards for Federal Land Acquisitions
- Appraising Distressed Commercial Real Estate
- 510 Advanced Sales Comparison and Cost Approach
- 540 Advanced Writing and Valuation Analysis
- 700 GRE The Appraiser as an Expert Witness: Preparations & Testimony
- 705 GRE Litigation Appraising: Specialized Topics & Applications
- 510 Advanced Income Capitalization
- 550 Advanced Applications
- The Lending World in Crisis
- Real Estate Damage Economics and Statistics
- Complex Litigation Appraisal Case Studies
- Gas Station Valuation: Real, Property, and Intangible Aspects
- Regression Analysis
- UAD After Affects: Efficiency vs. Obligation
- Residential Review Theory
- Valuation of Conservation Easements
- IRS Valuation of Donated Real Estate & Conservation Easements
- Using Spreadsheet Programs in Real Estate Appraisals
- General Review Theory
- Do's and Don'ts of Litigation Support
- Uniform Appraisal Standards of Federal Land Acquisition 2014
- Using Technology to Measure and Support Assignment Results
- Wind Turbine Effects on Value
- Contamination and the Valuation Process
- FHA Appraising for Valuation Professional
- Effective Report Writing
- Yellow Book Changes (USFLA) Overview for Appraisers
- Case Studies in Complex Valuation
- Subject Matter Expert Round Table

Ted Whitmer

- Advanced Comprehensive Workshop
- Attacking & Defending in Appraisal Litigation

Professional Appraisers Association of South Dakota – PAASD

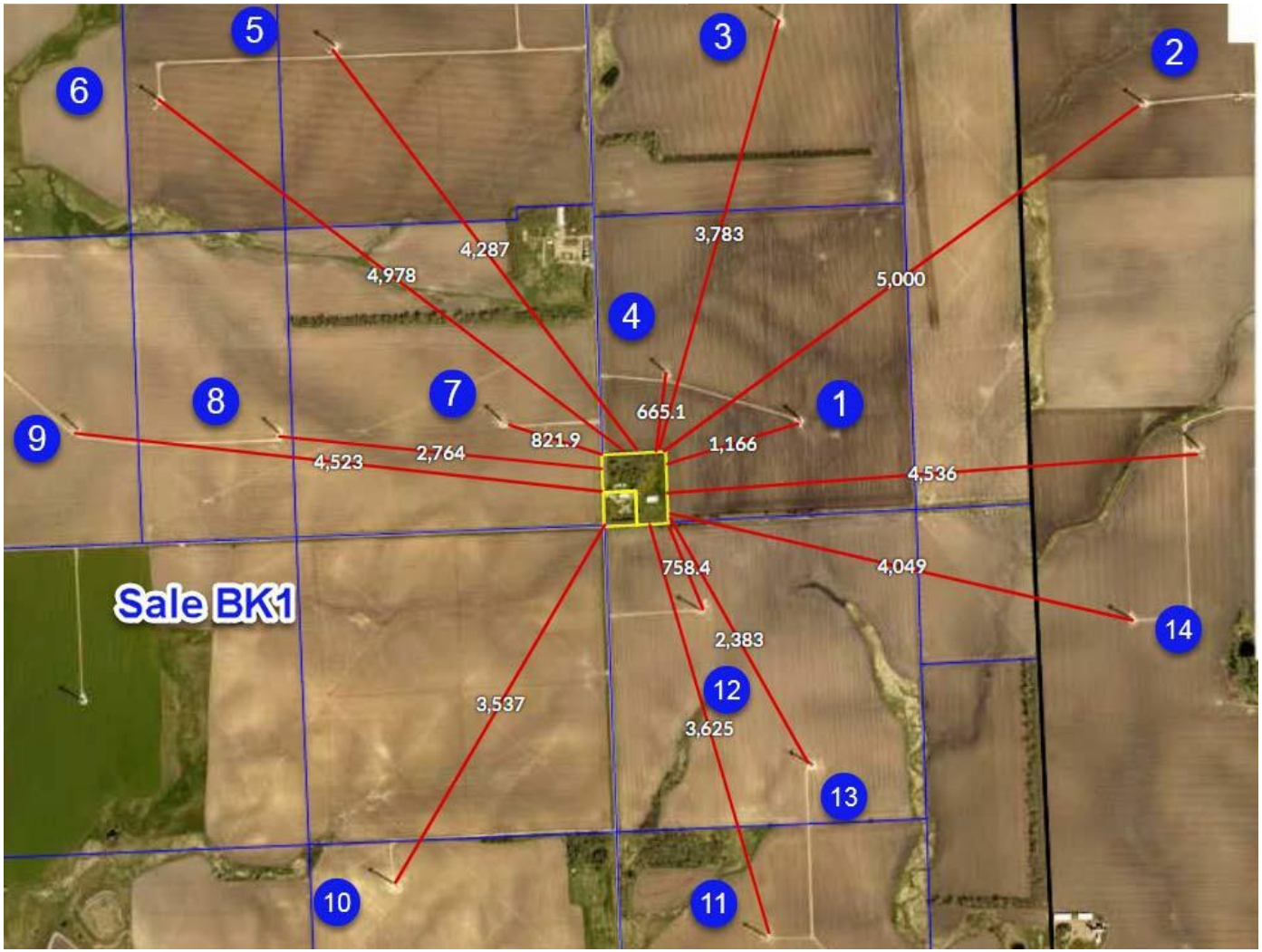
- What Every Certified Appraiser Needs to Know
- Training Course for Supervising Appraisers
- Fannie Mae UAD Compliance
- Builder Cost in Residential Construction
- Loss Prevention for Real Estate Appraisers
- Appraisal Desk & Field Review Form Reports
- Training Course for Supervising Appraisers
- Building Design & Construction
- Fannie Mae's Form Reports & the UAD
- Appraising Rural Residential Homes
- Intro to Partial Rights and Damages Issues in Condemnation

International Right of Way Association

- 104 Practice for the ROW Professional
- 200 Principle of Real Estate Negotiations
- 409 Easement Valuation
- 203 Alternate Dispute Resolution
- 803 Eminent Domain Law
- 403 Reviewing Appraisals in Eminent Domain
- 800 Principle of Real Estate Law
- 205 Bargaining Negotiations
- 801 United State Land Titles
- 700 Intro to Property Management
- 400 Appraisal of Real Property
- 900 Principles of Real Estate Engineering
- Lessons Learned on Linear Projects
- ROW Options on Native American Lands
- Complex ROW Scheduling and Cost Estimating
- Valuation of 1800 miles of Railroad ROW
- Environmental Issues with Transmission Lines
- 802 Legal Aspects of Easements
- 600 Environmental Awareness

Federal Highway Administration

- Appraisal Review for Federal-Aid Highway Programs
- Appraisal for Federal-Aid Highway Programs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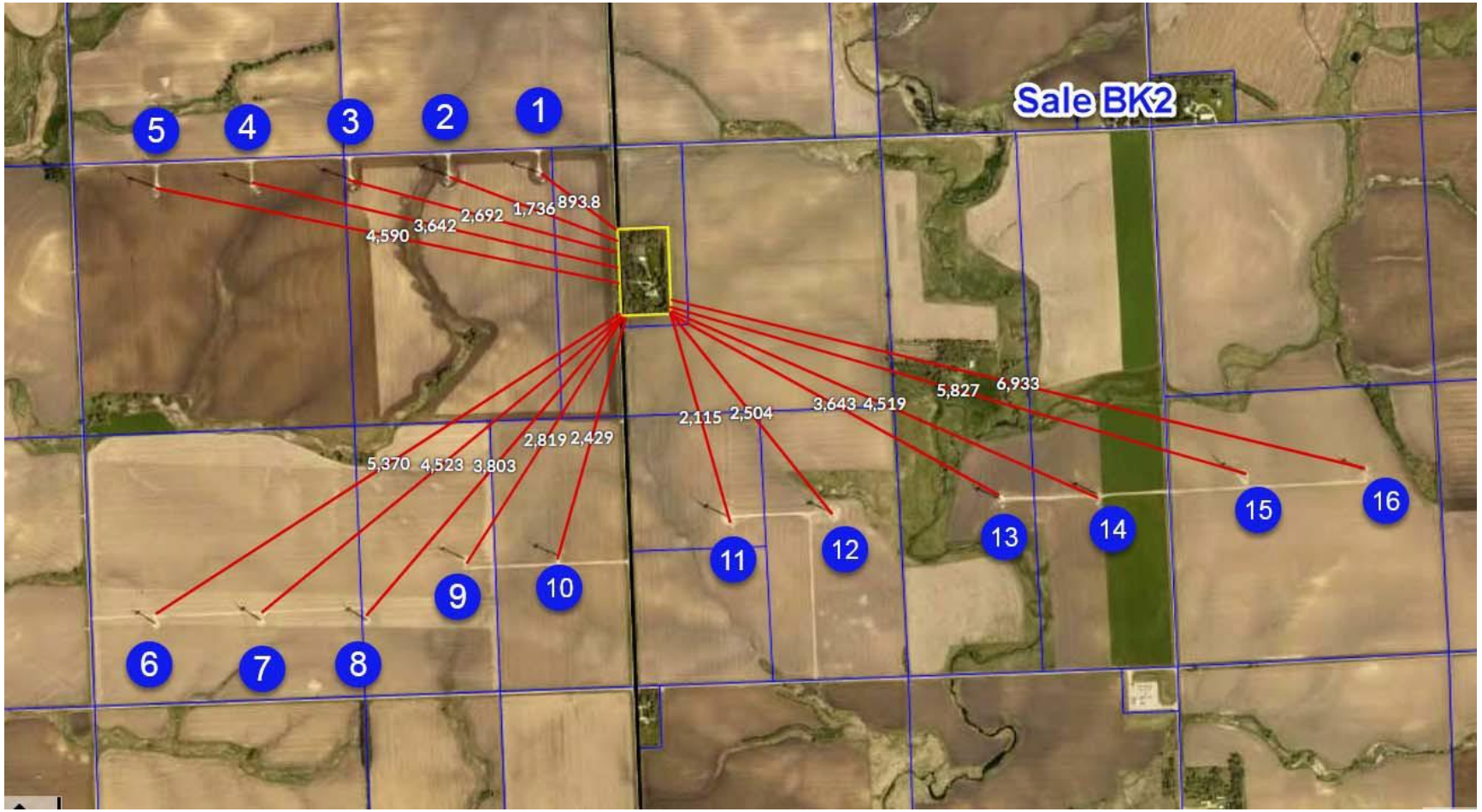
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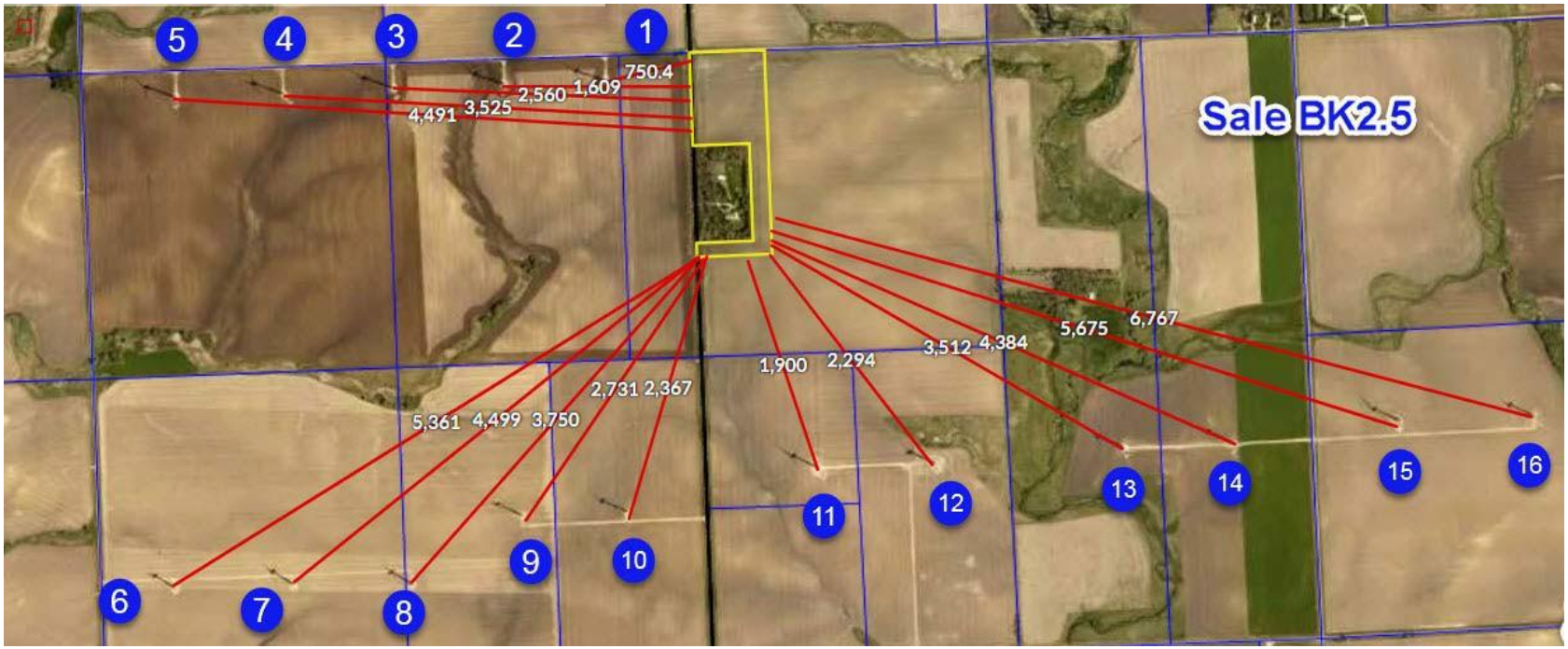
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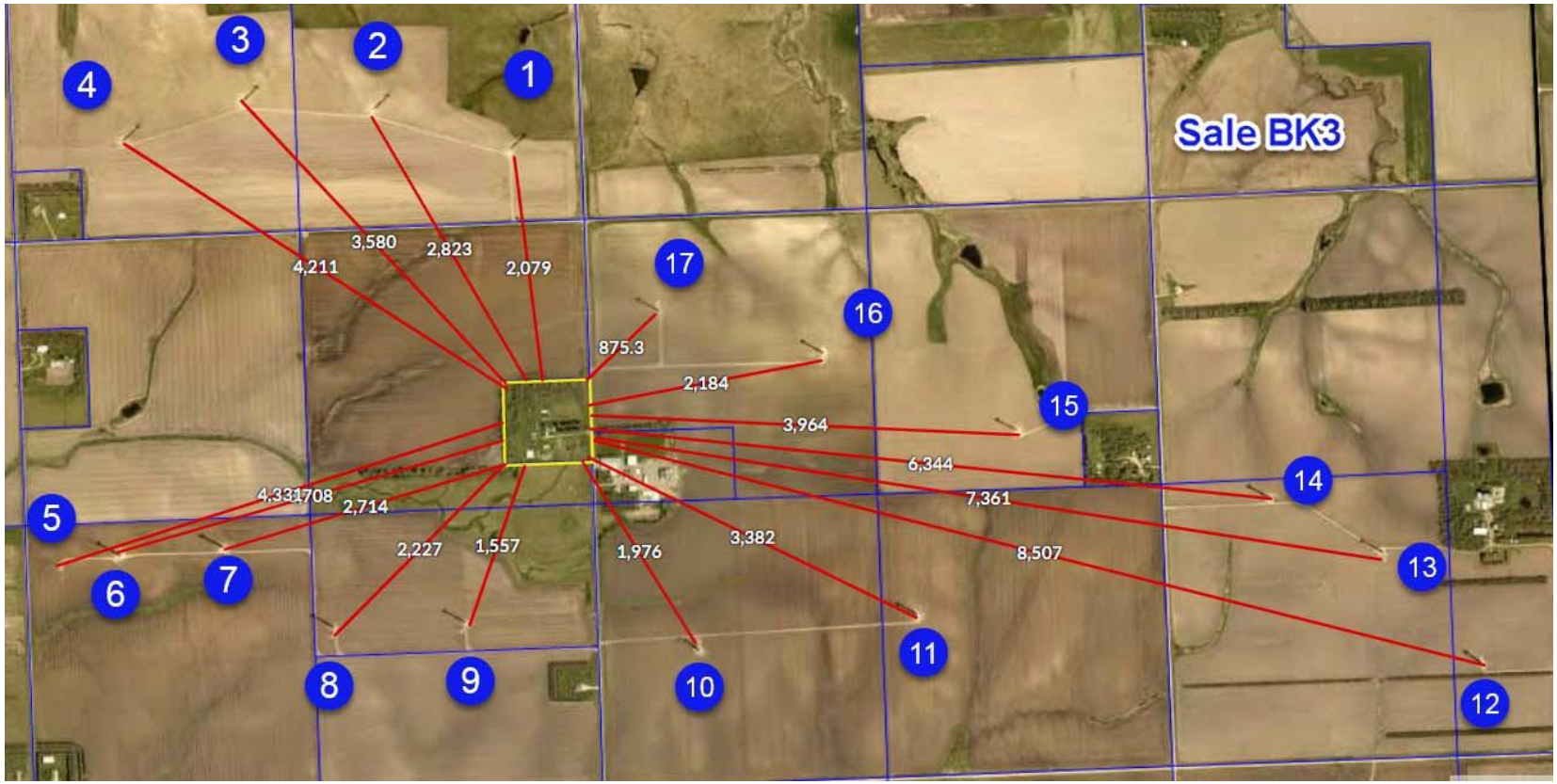
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6,344
7,361
8,507
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3,382


Sale Bk4
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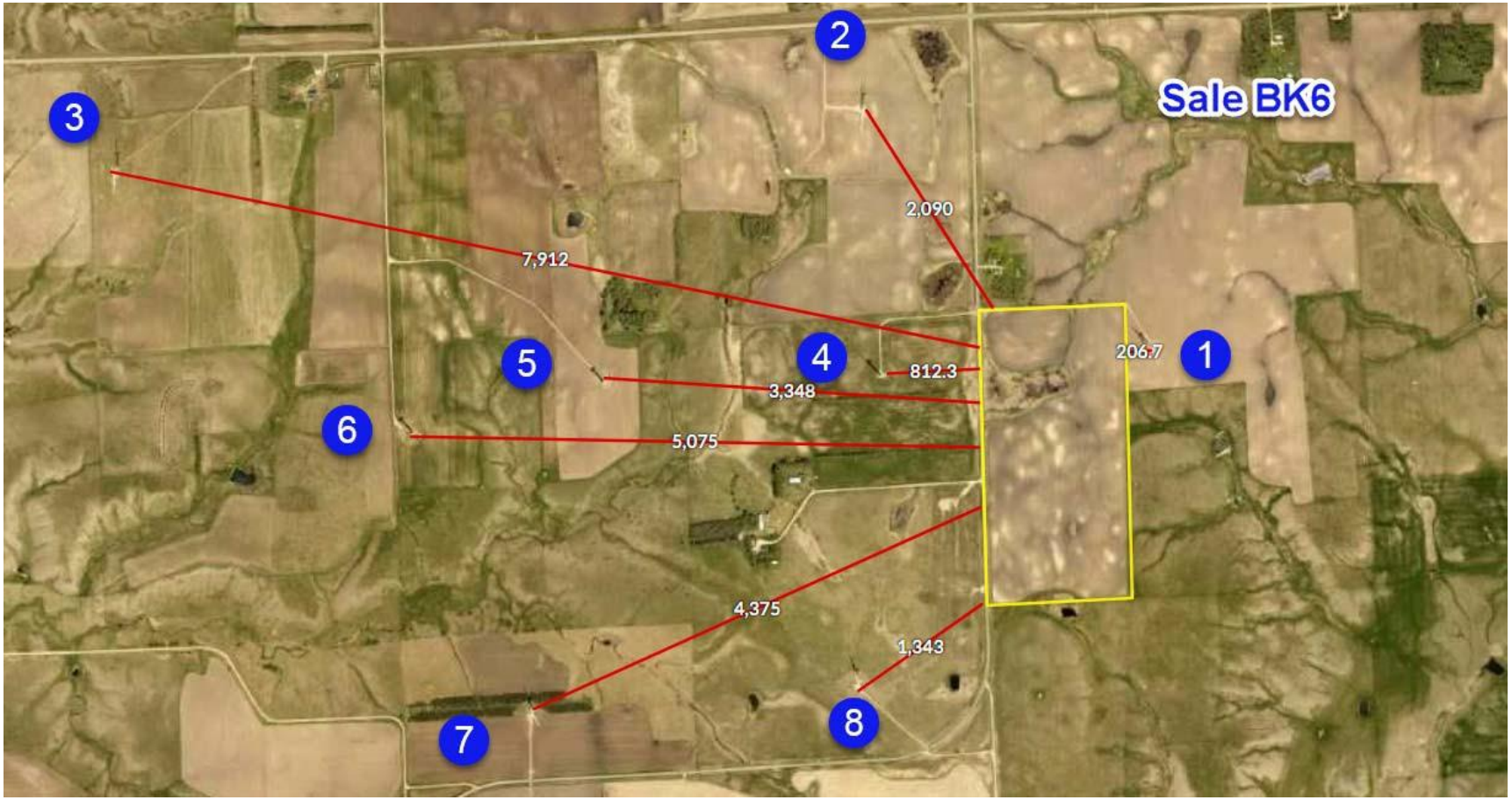
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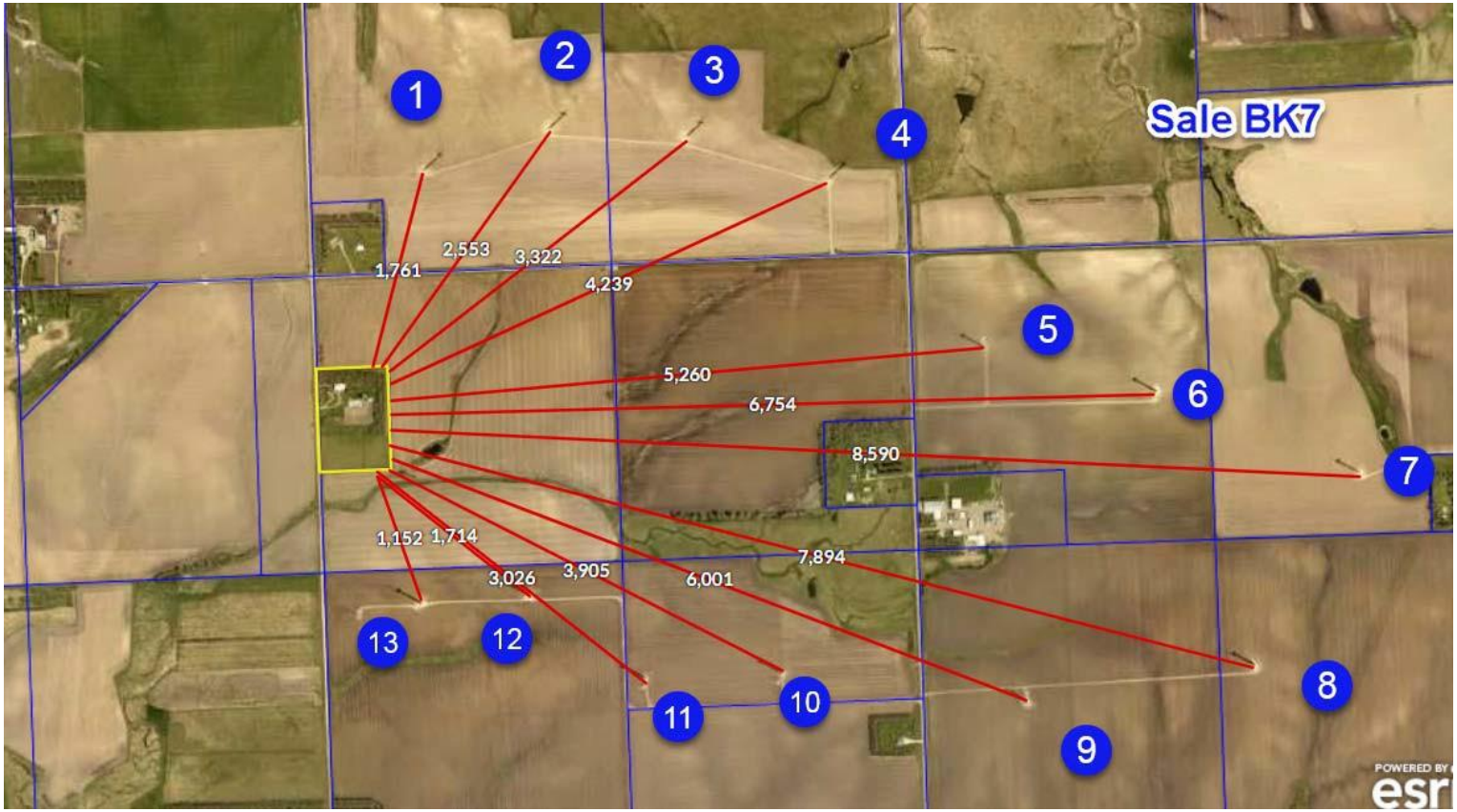
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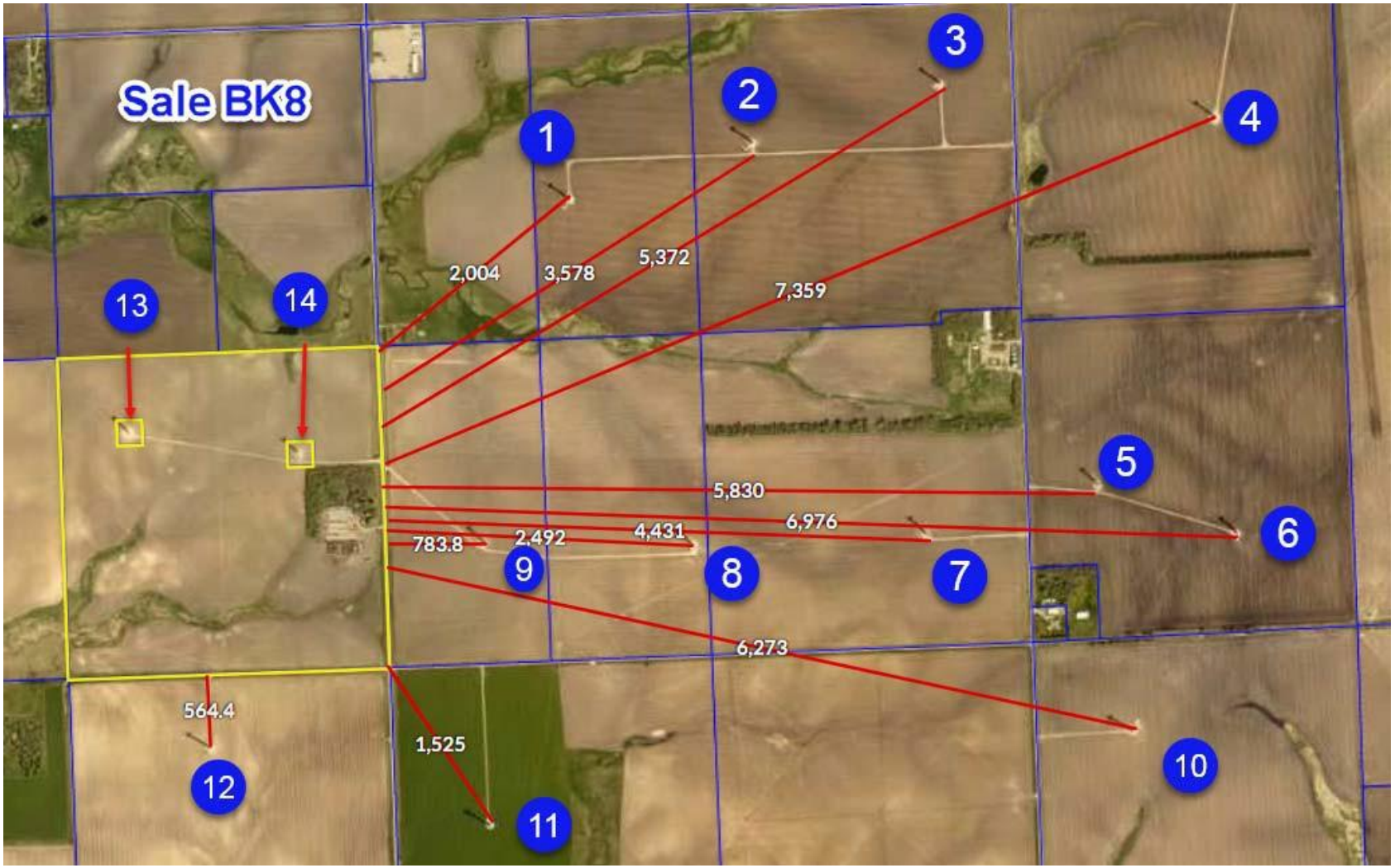
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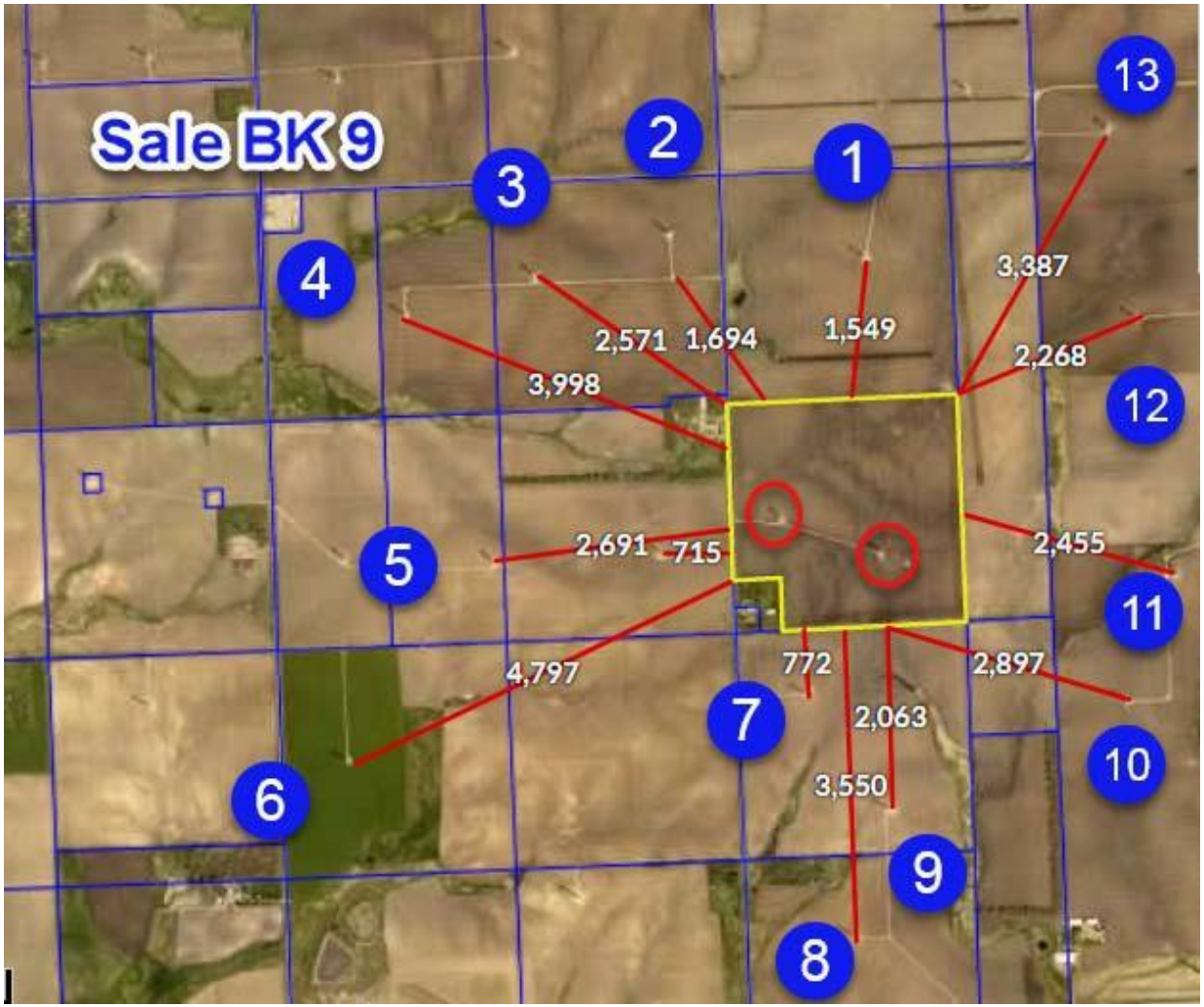
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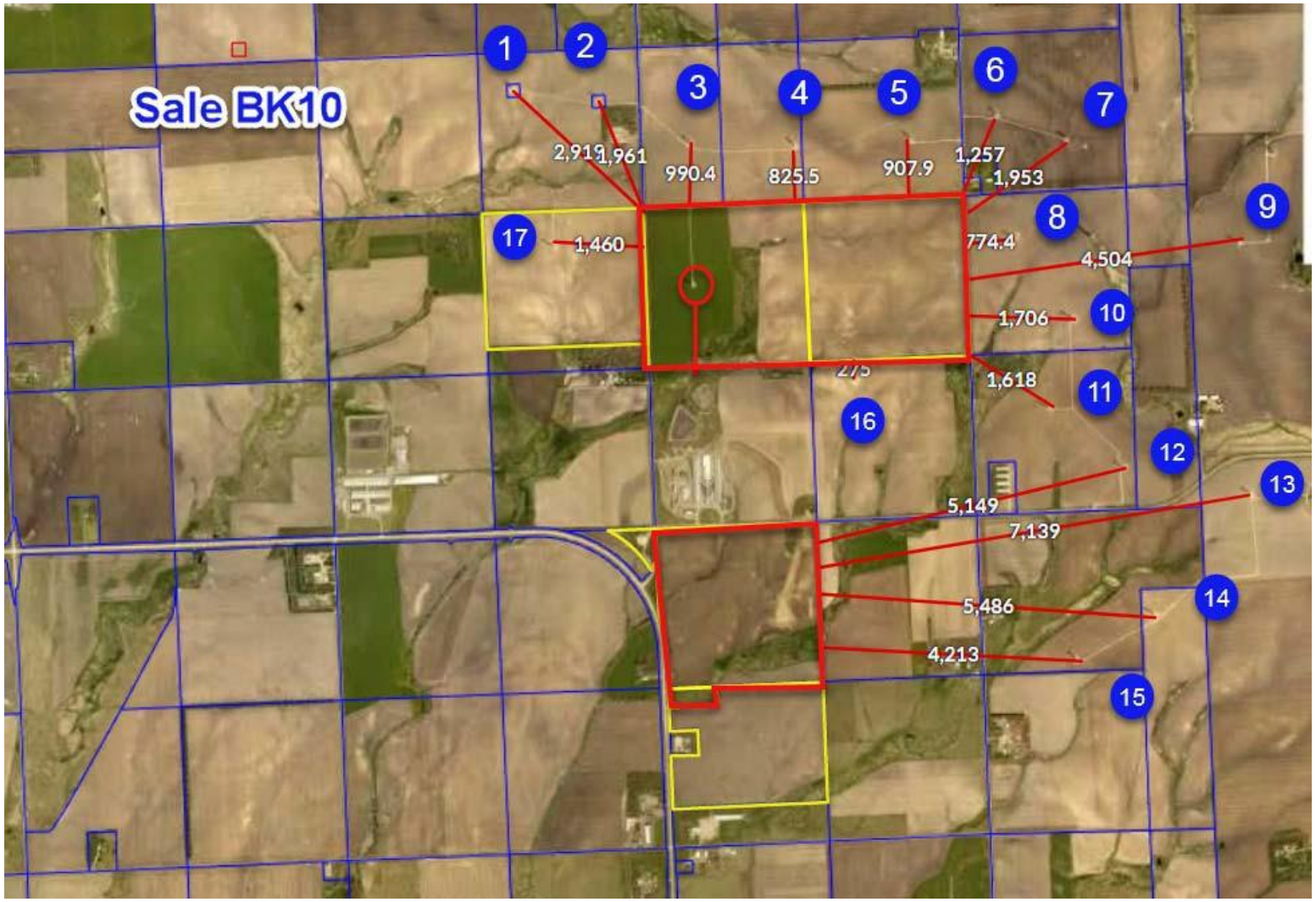
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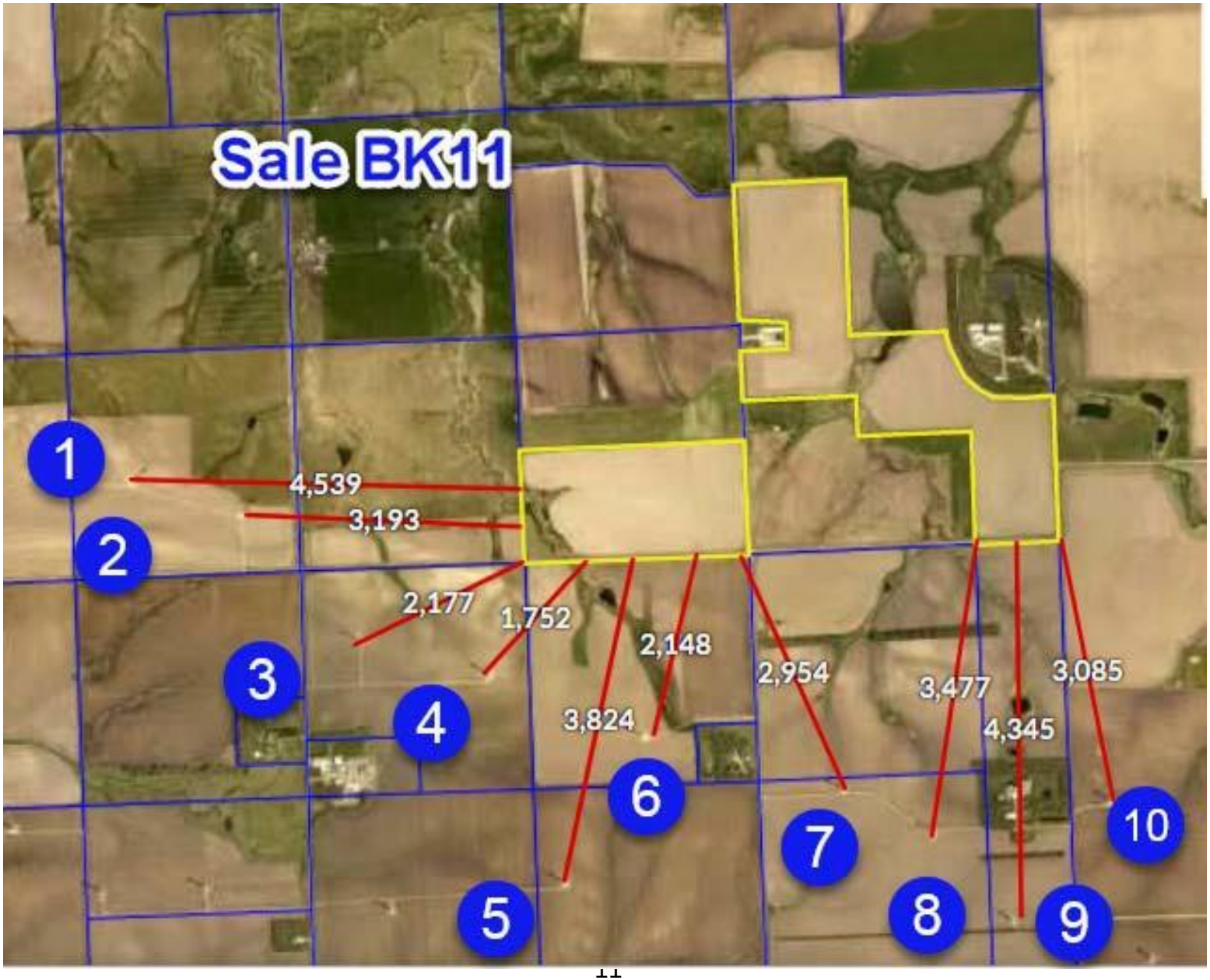
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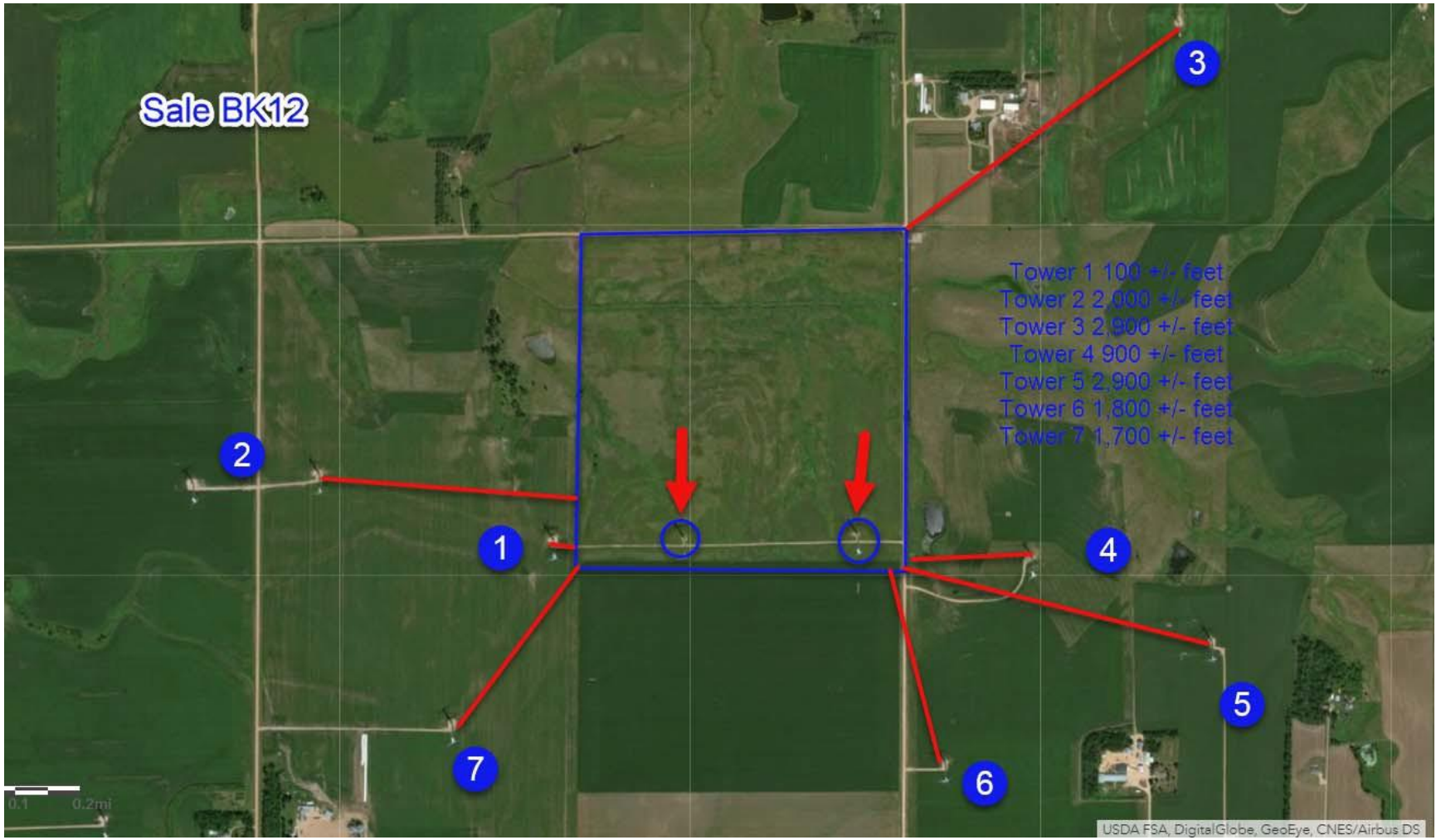
Sale BK12
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Tower 2 2,000 +/- feet
Tower 3 2,900 +/- feet
Tower 4 900 +/- feet
Tower 5 2,900 +/- feet
Tower 6 1,800 +/- feet
Tower 7 1,700 +/- feet
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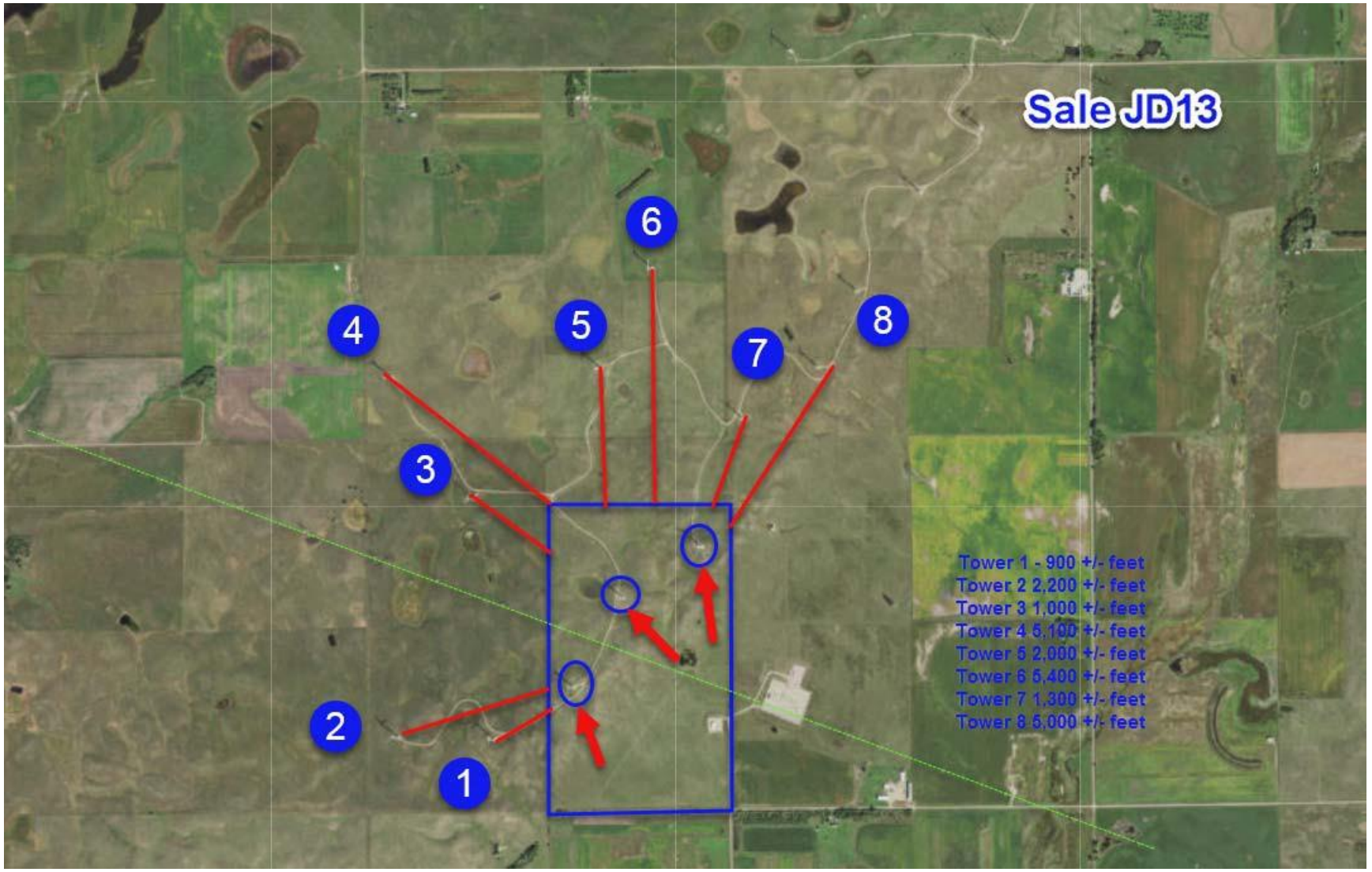
Sale JD13
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Tower 1 - 900 +/- feet
Tower 2 2,200 +/- feet
Tower 3 1,000 +/- feet
Tower 4 5,100 +/- feet
Tower 5 2,000 +/- feet
Tower 6 5,400 +/- feet
Tower 7 1,300 +/- feet
Tower 8 5,000 +/- feet

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET EL18-003

IN THE MATTER OF THE APPLICATION BY DAKOTA RANGE I, LLC AND DAKOTA RANGE II, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT COUNTY AND CODINGTON COUNTY, SOUTH DAKOTA, FOR THE DAKOTA RANGE WIND PROJECT

Direct Testimony of David M Hessler
On Behalf of the Staff of the South Dakota Public Utilities Commission
May 4, 2018

Q. Please state your name and business address.

A. My name is David M. Hessler. The address of my company's administrative offices is 38329 Old Mill Way, Ocean View, DE 19970, and my personal office is located at 1012 W Las Colinas Dr., St. George, UT 84790.

Q. Mr. Hessler, by whom are you employed and in what capacity?

A. I have been employed for over 27 years by Hessler Associates, Inc., as Vice President and a Principal Consultant. Hessler Associates, Inc. is an engineering consulting firm that specializes in the acoustical design and analysis of power generation and industrial facilities of all kinds, including wind energy projects.

Q. Please describe your educational background and your professional experience?

A. I received my Bachelor of Science in Mechanical Engineering (B.S.), 1997, *Summa cum Laude*, at the A. James Clark School of Engineering, University of Maryland, College Park, MD, and a Bachelor of Arts (B.A.), 1982, at the University of Hartford, Hartford, Connecticut. I am a registered Professional Engineer (P.E.) in the Commonwealth of Virginia and I am a member of the Institute of Noise Control Engineering (INCE). My professional specialization is the measurement, analysis, control and prediction of noise from both fossil fueled and renewable power generation facilities. I have been the principal acoustical designer and/or test engineer on hundreds of power station projects all over the

world and on roughly 70 industrial scale wind energy projects. My resume is also attached for reference as Exhibit_DMH-1.

Q. Have you ever testified as an expert witness before any court or administrative body? If so, what was the nature of your testimony?

A. Yes, on a number of occasions. For example, I have provided both written and extensive oral testimony before the Ohio Energy Facility Siting Board on behalf of the Applicant in support of the Buckeye Wind Farm project in Champaign County, OH. I prepared the noise impact assessment study for that project and testified with regard to that study. On another occasion I testified before the Wisconsin Public Service Commission on behalf of Clean Wisconsin, Inc., a non-profit environmental advocacy organization, with regard to the proposed Highland Wind Farm project in St. Croix County, WI where I was tasked with reviewing and evaluating the validity of the Applicant's noise assessment study for that project. A further listing of all cases where I have testified is included in Exhibit_DMH-1.

Q. What is the purpose of your testimony in this case?

A. I have been asked by the Staff of the South Dakota Public Utilities Commission to review and evaluate the adequacy of the noise assessment study carried out by Epsilon Associates, Inc. in support of the Dakota Range Wind Project, to consider any public comments on the project regarding noise, and to review and comment on, as appropriate, any testimony relevant to noise issues filed by or on behalf of the Applicant.

Q. What materials have you reviewed in this matter?

A. I have reviewed the "Sound Level Modeling Report" prepared by Epsilon Associates, Inc. and included in the permit Application submitted by Dakota Range Wind and the testimony of Mr. Robert O'Neal the author of this study. I have also read the written comments of Mr. George L. Holborn submitted during a public input hearing on March 21, 2018.

Q. Can you please summarize your overall opinion of the sound level modeling report submitted on behalf of the project?

A. In general, the quality of the work and noise modeling is perfectly satisfactory and consistent with good industry practice. I agree with the modeling methodology and would use the same software and make all the same assumptions myself. However, the study is entirely focused on simply determining whether the project will comply with the noise provisions relating to wind energy facilities contained in the Grant and Codington County Zoning Ordinances, both of which essentially limit the sound emissions from wind energy projects to no more than 50 dBA at "off-site residences", rather than assessing or addressing in any way the potential for an adverse community reaction to project noise.

Q. Does the noise limit of 50 dBA contained in the Grant and Codington County Zoning Ordinances automatically protect the community from disturbance or annoyance due to noise from wind turbines?

A. No. My experience testing and observing the community reaction to completed wind turbine projects in rural settings like this indicates that, although very commonly seen in many local noise ordinances, a limit of 50 dBA is too high to ensure that a wind project will have only a minimal or acceptable impact. When such a sound level actually occurs at a residence, whether participating or not, there is a distinct possibility of complaints and dissatisfaction.

Q. According to the Dakota Range noise study, is a sound level of 50 dBA predicted at any residences?

A. No, which I am pleased to see.

Q. Since you believe a sound level of 50 dBA is too high, would you recommend a lower noise limit for this project?

A. Yes, I believe the community would be better served and protected with a 45 dBA noise limit as a definite maximum at non-participating residences and as an earnest design goal at participating residences. I would add that even this noise limit would not guarantee that no one would be bothered by project noise. In fact, I generally recommend limiting the average sound level from a wind project to 40 dBA at non-participating residences as an ideal design goal, because at that point the sound level is so low in absolute terms that complaints or issues

with noise become quite rare. It is important to clarify that both of these suggested limits are considered to be long-term averages measured over a period of a week or more and not instantaneous or short-lived maxima.

Q. Is your suggested long-term average sound level of 45 dBA at residences currently being met?

A. According to the modeling results presented in the report, my recommended long-term average limit of 45 dBA would be met at all residences whether participating or not. Moreover, the model predictions include a unilaterally applied 2 dB uncertainty factor that has been added to the maximum turbine sound power level, meaning that the predictions are somewhat conservative. At the same time, it must be understood that wind turbine sound levels commonly fluctuate within a range of about +/- 5 dBA and sometimes vary up to roughly +/- 10 dBA depending on wind and atmospheric conditions, so a 2 dB design margin is not as significant as it might seem.

Q. Is your suggested ideal design goal of 40 dBA at non-participating residences currently being met?

A. No, but that is not unusual. 40 dBA is a very low sound level that requires very large set back distances that are only usually practical at remote or very sparsely populated sites. In this case, the model results indicate that 13 non-participating residences would be in the 41 to 44 dBA range. However, if the 2 dB explicit

design margin were subtracted, it would leave only 2 non-participants above 40 dBA - and then only by 1 and 2 dBA.

Q. What would you surmise from these predicted sound levels?

A. In general, I would consider the very limited number of non-participants over 40 dBA and the fact that a level of 45 dBA or less is conservatively predicted at all residences a favorable situation in the sense that I would anticipate very few complaints about noise from this project based on the community reactions to operating projects that I have personally observed during compliance tests.

Q. Have you reviewed the comments about possible adverse health effects due to low frequency noise submitted by George Holborn?

A. Yes. Mr. Holborn brings up the important issue of possible disturbance and discomfort from inaudible low frequency noise and references the work of the Australian acoustician Steven Cooper. The A-weighted sound level limits discussed above relate to audible “swishing” noise but Cooper, in his paper “Subjective perception of wind turbine noise – The stereo approach” presented at the Acoustical Society of America meeting this past December, presents fairly compelling evidence that completely inaudible pressure pulsations are perceptible to certain individuals as disturbing sensations. In a controlled double blind laboratory experiment people with known sensitivity to low frequency wind turbine noise were able to accurately perceive when a recording of inaudible

wind turbine sound measured inside a home at an existing project was randomly played, while others in a control group essentially noticed or felt nothing.

Q. Have you ever done any field work yourself investigating complaints about low frequency wind turbine noise?

A. Yes. As a part of a team of researchers, I participated in an investigative survey at a site in Wisconsin where a number of families had abandoned their homes due to disturbance from what was described as low frequency noise. We spoke with the residents and measured sound levels in the rooms and specific locations where they said the noise was the worst in the middle of night with the project operating. I heard nothing but complete silence, I felt nothing and I could not understand what these people were complaining about. This experience directly parallels Cooper's where, in the Master Resource interview (2/1/18) cited by Mr. Holborn, Cooper states "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."

Q. What is your general opinion on this matter now?

A. Prior to this recent work by Cooper I was puzzled by these kinds of complaints and saw nothing in any measurements that I've ever taken of wind turbines that could explain them. Nor did I find anything in the work other investigators that I felt credibly established a cause and effect relationship. In fact, the preponderance of the evidence suggests that wind turbines produce only a

miniscule amount of low frequency sound that is dramatically below the threshold of perception. However, Cooper's experimental results now convince me that a minority of people do have a sensitivity to the minute pressure pulsations associated with the blade passing frequency, which is typically extremely low; less than 1 Hz. The question is: how small or large is this minority? My sense is that it is very small because out of the many, many wind turbine projects that currently exist all over the world this kind of complaint, to my knowledge, has only arisen as a serious issue at a small handful. If a large or even moderate segment of the population had this sensitivity, such complaints would be commonplace and every project would be overwhelmed by this problem. Consequently, I think there is a small risk with any proposed project that some nearby residents could be seriously disturbed by this aspect of the wind turbine's sound emissions.

Q. Do you believe that the Commission should require a sound test once the project is operational to verify that it is actually producing the predicted sound levels?

A. No, I don't think such a survey is warranted as a firm prerequisite in this instance because the expected sound levels at non-participating residences are so far below the Grant and Codington County Zoning Ordinance limit of 50 dBA that a violation of that limit is highly unlikely. However, it would advisable for the Commission to reserve the right to require a verification/investigative survey if serious and on-going complaints should arise from any party, participating or not.

Q. Please provide your recommendation for a permit condition the Commission should consider.

A. Because the Applicant already expects that the Project will generate sound levels below 45 dBA at all residences, I think it would be reasonable to make this performance of condition of the operating permit. More formally, I would suggest the following condition: The Project, exclusive of all unrelated background noise, shall not generate a long-term average sound pressure level, as measured over a period of at least one week and/or under all integer wind speeds from cut in to full power, of more than 45 dBA at any occupied residence, irrespective of participation status. Should any serious and on-going complaints about noise arise, and there is reason to believe that the 45 dBA limit is not being met at any residence, the Commission shall require the Project Owner to engage a qualified acoustical engineering firm to carry out a verification field survey to quantify the Project-only sound level at the complaint location(s) and determine if it is in compliance with this condition. If the long-term average level exceeds 45 dBA then the Project Owner shall operate the offending turbine(s) in a low noise mode sufficient to bring the average sound level at the complaint location(s) down to 45 dBA or less or take whatever other steps are necessary to rectify the situation.

Q. Does this conclude your testimony?

A. Yes.

CURRICULUM VITAE

DAVID M. HESSLER

Title:	Principal Consultant, Vice-President Hessler Associates, Inc.
Professional Affiliations:	Professional Engineer (P.E.), Commonwealth of Virginia Member Institute of Noise Control Engineering (INCE) National Council of Acoustical Consultants (NCAC)
Education:	Bachelor of Science in Mechanical Engineering (B.S.), 1997 *Summa cum Laude* A. James Clark School of Engineering University of Maryland, College Park, MD Bachelor of Arts (B.A.), 1982 University of Hartford, Hartford, CT
Employer:	Hessler Associates, Inc. 3862 Clifton Manor Place Haymarket, VA 20169 Years in present position: 26

Current Job Description: Acoustical engineer specializing in the prediction, assessment and mitigation of environmental noise from new and existing power generation and industrial facilities. Typical tasks include:

- Field measurement studies of existing ambient sound levels in the vicinity of proposed project sites
- Computer noise modeling of new facilities prior to construction
- Environmental impact assessments for new projects
- Noise mitigation design studies of new facilities
- Verification measurements of completed facilities
- Diagnostic studies of facilities with existing noise problems
- Design and specification of noise mitigation measures
- Educational lectures on noise issues for private corporations
- Expert witness testimony

General Experience: As an outside consultant to nearly all the major power industry EPC contractors, developers and OEM's, have been the principal acoustical designer of over 400 power plants and industrial facilities worldwide ranging from a 3900 MW power station in Saudi Arabia to numerous combustion turbine combined cycle plants to refineries and wind turbine projects. Typically, the focus of the work on these projects was to anticipate potential noise impacts at sensitive receptors near the project and recommend practical noise abatement measures to avoid them. In addition, extensive verification measurements in and around the completed power plants and wind farms have been performed to confirm that the design recommendations have been successfully executed.

Wind Turbine Experience: Over the past 14 years have performed noise impact evaluations and siting optimization studies for roughly 70 large wind turbine projects in

the United States and Canada, involving nearly all current makes and models of wind turbines. Have developed test protocols and conducted long-term field measurement surveys of numerous newly completed wind projects to evaluate compliance with applicable permit conditions, to investigate complaints and/or to verify the accuracy of pre-construction noise modeling. Have carried out field tests of wind turbine sound power level in strict accordance with the IEC 61400-11 test methodology. Have carried out field measurement studies of operating wind turbines to evaluate their low frequency sound emissions, nacelle noise sources and radial directivity characteristics. Have testified as an expert witness at permitting hearings for proposed wind projects. Attended six bi-annual Wind Turbine Noise conferences.

Recent Papers and Publications:

"Wind Turbine Noise", Chapter 7 *Measuring and Analyzing Wind Turbine Sound Levels*, Multi-Science Publishing Co., Brentwood, Essex, UK, Jan. 2012. Comprehensive book on all aspects of wind turbine noise. Each chapter written by a recognized expert in that subject.

Teleseminar "Wind Turbine Siting and Best Practices", National Regulatory Research Institute (NRRI), Invited speaker, Jan. 2012.

"Best Practices Guidelines for Assessing Sound Emissions from Proposed Wind Farms and Measuring the Performance of Completed Projects", Prepared for the Minnesota Public Utilities Commission under the auspices of the National Association of Regulatory Utility Commissioners (NARUC), Oct. 2011.

"Accounting for Background Noise when Measuring Operational Noise from Wind Turbines", Fourth International Meeting on Wind Turbine Noise, Rome, Italy, Apr. 2011.

"Recommended noise level design goals and limits at residential receptors for wind turbine developments in the United States", *Noise Control Engineering Journal*, J.59 (1), January-February 2011.

"Wind tunnel testing of microphone windscreen performance applied to field measurements of wind turbines", Third International Meeting on Wind Turbine Noise, Aalborg, Denmark, June 2009.

"Experimental study to determine wind-induced noise and windscreen attenuation effects on microphone response for environmental wind turbine and other applications", *Noise Control Engineering Journal*, J.56, July-August 2008.

Expert Witness Cases:

Before the Washington State Energy Facilities Siting Board (EFSEC) on behalf of Bechtel and the Cherry Point Cogeneration Project, Bellingham, WA, 2003. Permitting support for a proposed combined cycle power plant facility.

Before the Public Service Commission of West Virginia on behalf of the Longview Power Project near Morgantown, WV, 2006. Permitting support for a proposed coal-fired power plant facility.

Before the Pennsylvania Department of Environmental Protection on behalf of Waste Management and the Alliance Sanitary Landfill in Taylor, PA, 2006. Support in defending against a Class Action Lawsuit brought by neighbors of the landfill.

Before the Office of the Attorney General of New York on behalf of the Hudson Valley Community College Cogeneration (Diesel) Plant. Support in defending against a Class Action Lawsuit brought by neighbors.

Before the Hanover County (VA) Board of Supervisors on behalf of Martin Marietta Materials and the Doswell Quarry, 2008. Permitting support for a proposed quarry expansion.

Before the New Hampshire Site Evaluation Committee on behalf of Granite Reliable Power, LLC, 2008. Docket No. 2008, July 2008. Permitting support for a proposed wind turbine project in Northern New Hampshire.

Before the Public Utilities Commission of Ohio, Ohio Power Siting Board on behalf of EverPower Renewables and the Buckeye Wind Project, 2008. Permitting support for a proposed wind turbine project in Ohio.

Before the Wisconsin Public Service Commission on behalf of Clean Wisconsin with regard to the proposed Highland Wind Farm in Forest, WI. Docket No. 2535-CE-100. Engaged as an independent expert to evaluate the Applicant's sound studies and the testimony of opposition groups.

Before the Public Utilities Commission of Ohio, Ohio Power Siting Board on behalf of EverPower Renewables and the Buckeye II Wind Project, 2012. Permitting support for a proposed wind turbine project in Ohio.

Before the Maine State Government Energy, Utilities and Technology Committee on behalf of Patriot Renewables and the Beaver Ridge Wind Project, 2014. Peer review of operational sound testing by others.

BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

DOCKET NO. EL18-003

IN THE MATTER OF THE APPLICATION BY DAKOTA RANGE I, LLC AND DAKOTA RANGE II, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT COUNTY AND CODINGTON COUNTY, SOUTH DAKOTA, FOR THE DAKOTA RANGE WIND PROJECT

Surrebuttal Testimony of David Lawrence
On Behalf of the Staff of the South Dakota Public Utilities Commission
June 8, 2018

Q: State your name.

A: My name is David Lawrence.

Q: Did you provide Direct Testimony in the Docket on May 4, 2018?

A: Yes.

Q: Did you conduct any further market research since your Direct Testimony on May 4, 2018?

A: Yes. In response to Mr. MaRous' direct testimony indicating there was only one sale in South Dakota near a wind project, I performed research in Brookings County to identify sales that have been influenced by a wind tower, turbine or wind project. My preliminary research identified thirteen arm's length transfers in the proximity of a wind tower. Of these thirteen sales, six sales were rural residential properties, and seven sales were agricultural properties. With the time requirements of my direct testimony, hearings and preliminary research, I was not able to investigate and verify the Brookings sales research before the filing deadline. Since submission of my Direct Testimony, I have taken the opportunity to study the Brookings sales research. A summary of the research is found in the addendum of my testimony, identified as Exhibit 1.

Q: Can you briefly describe the scope of work that was applied to the Brookings County sales?

A: Due to time constraints of the June 12, 2018 hearing, I was not able to perform a complete case-by-case analysis for the thirteen sales identified. I did prioritize the residential sales BK1, BK2, BK3, BK4, BK5 and BK7. For these sales I performed a site inspection, interview analysis, and a sales analysis. The remaining sales were analyzed with site inspections and interviews. I set out on May 23, 2018 to begin my field research and inspect each property with particular emphasis on examining the proximity of a wind tower and how the tower proximity relationship can influence rural properties. Inspections were done from the public roadway for sales BK1, BK2.5, BK6, BK7, BK9, BK10, BK11 and BK12. In five cases the property owner was present, and I was able to complete an on-site inspection with sales BK2, BK3, BK4, BK5, and BK8. I did not have time to drive to Jerauld County, and relied on high resolution aerial images for sale JD13 and a telephone participant interview. In addition to the BK sales, I visited several rural residential and agricultural properties in the market area influenced by a wind tower. These inspections allowed me to evaluate the influences a wind tower can have on the different property types in the market area of Brookings County. After completing the field work, the next step was to interview as many of the participants in the transaction as possible. I knew a buyer's name and address, and/or a broker involved with the transaction from preliminary research I accomplished at the beginning of May. Given the name and address, I was able to search for phone numbers. Unfortunately, finding a working phone number for participants is becoming more difficult, but I was able to talk

with about twenty participants by phone or in person. The objective of the interview analysis was to verify terms of the sale and to inquire whether the sale and/or subsequent use of the property were in any way affected by the proximity of a wind tower. A set of scripted questions were asked in such a manner that no bias or preconceived notions were projected during the interview. Based on the recorded legal documents, site inspections, and information gathered, a detailed description of BK1, BK2, BK3, BK4, BK5 and BK7 was developed for the sales analysis. The next step was to develop data on property sales that were similar in time, location and property type to each of the BK sales, but not in proximity to a wind tower. The methodology of the analysis is similar to the sales comparison approach in the appraisal process. To identify this research, I used the Brookings County MLS, Beacon and aerial images to confirm that each comparable sale was unaffected by a wind tower, turbine or wind project. Then each of these sales were summarized in terms of physical characteristics and qualitatively analyzed for differences. The uninfluenced sales were compared to the BK influenced sale for analysis. The final step was to analyze the information collected for each transaction and draw conclusions with respect to the effect, if any, of the proximity of the wind tower on the transaction or on use of the property. The summary of BK1, BK2, BK3, BK4, BK5 and BK7 can be found in Exhibit 1. As mentioned previously, I did not have sufficient time to complete a thorough analysis with each of the thirteen individual sales. My scope of work did not include: 1) a sales analysis for sales BK6, BK8, BK9, BK10, BK11, BK12 and JD13; 2) a site visit for JD13; 3) a review of the chain of title for each property ownership since the project first became operational; 4) a site visit and additional verification for the

comparable sales identified with MLS; 5) an analysis of the history of the wind project(s) in Brookings County, such as installation date, tower characteristics, project capacity, project construction, operational history etc. and 6) supplemental research in the other thirteen South Dakota counties with operating wind projects.

Q: What are the results of your additional market research?

A: The results of the market research are provided in the addendum and identified as Exhibit 1. The research is presented in the following order:

1. Transaction Summary Table -- sales BK1, BK2, BK3, BK4, BK5, and BK7
2. Transaction Summary Table -- sales BK6, BK8, BK9, BK10, BK11, BK12 & JD13
3. Interview Summary Table
4. Individual Sales Analysis -- sales BK1, BK2, BK3, BK4, BK5 & BK7

Q: What are your general conclusions about the research you completed?

A: Based on my research within the Brookings County market, the evidence supports the presumption there have been no adverse effects on the selling price of rural residential properties in proximity to a wind tower, turbine or wind project. However, the interview and site analysis support the presumption that proximity to a wind tower could influence the property owner's bundles of rights, such as the right to quiet enjoyment. Given the responses from market participants, there is a relationship between the distance from a turbine and the effects on value perceived by individual property owners who live in proximity to wind towers. Wind tower noise is the number one reason cited by market participants for a perceived impact on value; however, the sales data suggests otherwise. More specifically, the Brookings County research for rural residential properties suggests: 1) there was no discernible adverse impact on the selling prices in Brookings County that

could be supported for sales BK1, BK2, BK3, BK4, BK5 and BK7; 2) Interviews with buyers of properties near wind towers were unanimous to report the proximity of the wind tower did not influence the price they paid; 3) In six of six rural residential sales, the market data was consistent, even though the site inspection observed influences of noise and view obstructions within the property boundaries.

Although I did not complete a sales analysis for the agricultural sales, the research supports the presumption there have been no adverse effects on the selling price of agricultural properties in proximity to and within the boundaries of the property with a wind tower. During the interview process, participants of agricultural properties were consistent to report the price paid was not affected by a wind tower and in some cases reported a stronger price per acre when the wind payments transferred with the property. The most common issues farmers cited about wind towers is the limitation of aerial spraying, poor reclamation, and compaction issues after the installation of the towers, possible yield loss due to the inability to plant straight rows and the difficulties associated with working around the towers during planting and harvest. Without comparison of the sales evidence with the interview evidence, the agricultural analysis is determined to be inconclusive; however, all agricultural participants were consistent to report there was no adverse effect to the price paid because of the presence of a wind tower. The summary of my research is limited to Brookings County and supported by analyzing six rural residential sales, seven agricultural sales, and twenty market participant interviews.

Q: What is your response to the research and analysis completed for the Brookings County?

A: I would caution the commissioners or any reader of my testimony that the above research is only a small representation of 1 of 14 counties in South Dakota where there is an operating wind project. With an assignment of this nature, I would typically have a multi-county or tri-state research area with a sales population of at least fifteen sales for a case-by-case analysis (per property type) with participant interviews of more than thirty. While the research is consistent with the NBNL study and Mr. Marous' research, a pool of six rural residential and seven agricultural sales is a limited population upon which to base conclusive results. Brookings County represents only seven percent of the study area that is available in South Dakota for research of the impacts of wind projects on real property values. Nevertheless, the research reported in my testimony provides a useful starting point from which to consider the facts of a particular situation, and does not rule out that an individual property could be adversely impacted from the presence of a wind tower, turbine, or wind project.

Q: Mr. Mauersberg attaches the Brookings County 2015 Property Value Survey to his Rebuttal Testimony (Exhibit 1), and Mr. MaRous concurs with the study in his testimony. Do you agree with the methodology and results of the study?

A: No, I do not agree. I have read the Brookings County 2015 Property Value Survey developed by Prevailing Winds, LLC and the results of the study could be misleading. Moreover, 1) it does not follow the accepted appraisal methodology for a study of this

type; 2) the data was developed by Prevailing Winds, LLC, who is an advocate for wind energy in South Dakota. The purpose of a study of this nature is to promote and maintain a high level of public trust in the development and reporting of such results. There is no way to ascertain if the assignment was developed with impartiality, objectivity, and independence. Personal interests and bias surround the author of the study; 3) As previously discussed in my Direct Testimony on page thirteen, assessment value is not market value. Assessment value can be higher or lower than market value. I have difficulty understanding the correlation in using assessment value trends to measure the impacts on market value from a wind project. Mass appraisal techniques are used for assessing thousands of properties in the county for taxation, not determining if an individual property shows a negative or positive influence from an externality such as a wind tower.

Q: Does this conclude your testimony?

A: Yes.

Exhibit 1:

Rural Residential Transaction Summary Table						
Transaction Reference	**Property Type**	**Physical Evidence of Effects**	**Interview Evidence of Effects**	**Sales Evidence of Effects**	**Consistency of Sale Evidence with Interview Evidence**	**Overall Conclusion**
BK1	Rural Residential	Yes	None	None	Consistent	No measurable effects
BK2	Rural Residential	Yes	None	None	Consistent	No measurable effects
BK3	Rural Residential	Yes	None	None	Consistent	No measurable effects
BK4	Rural Residential	Yes	None	None	Consistent	No measurable effects
BK5	Rural Residential	*None*	None	None	Consistent	No measurable effects
BK7	Rural Residential	Yes	None	None	Consistent	No measurable effects

****Turbines were not in operation during the site visit of BK5. Winds light and variable. ****

Ag Transaction Summary Table						
Transaction Reference	**Property Type**	**Physical Evidence of Effects**	**Interview Evidence of Effects**	**Sales Evidence of Effects**	**Consistency of Sale Evidence with Interview Evidence**	**Overall Conclusion**
BK2.5	AG	None	None	**Not Developed**	Inconclusive	None apparent per interview
BK6	AG	None	None	**Not Developed**	Inconclusive	None apparent per interview
BK8	AG/Res	None	None	**Not Developed**	Inconclusive	None apparent per interview
BK9	AG	None	None	**Not Developed**	Inconclusive	None apparent per interview
BK10	AG	None	None	**Not Developed**	Inconclusive	None apparent per interview
BK11	AG	None	None	**Not Developed**	Inconclusive	None apparent per interview
BK12	AG	None	None	**Not Developed**	Inconclusive	None apparent per interview
JD13	AG	None	None	**Not Developed**	Inconclusive	None apparent per interview

****Sales analysis not developed due to time constraints****

Interview Summary Table			
Interview Reference	**Property Type**	**Participant**	**Interview Summary Comments**
BK1	Residential	Broker	Can be noisy. Limits potential buyers . Doesn't seem to affect price.
BK2	Residential	Buyer	Did not affect purchase decision. Don't like the noise. Flicker effect certain times of the day. Blade broke and threw fragments near the house. Sounds like a continual swooshing sound when it's windy.
BK2 BK2.5	Res/AG	Seller	Satisfied with price. Could feel vibrations inside the house. Glad not to be living near wind towers. Had to give up a wind lease option to sell the house.
BK2.5	AG	Buyer	No affect on purchase price of BK2.5. Own & lease farmland with wind towers. Live in proximity to wind towers. Noisy. Poor reclamation after construction of towers; compaction & loss of yields. Difficult to farm around towers. Currently have farmland under contract with towers.
BK3	Residential	Broker	Some buyers won't look at home near wind towers. However, there is demand for acreages in the market and it doesn't seem to affect the price.
BK3	Residential	Buyer	The towers sound like jet planes when you are working in the yard. But paid the same, even though they don't like the noise.
BK4	Residential	Buyer	Some noise, but doesn't bother me. Paid the same. Happy with purchase.
BK4	Residential	Seller	Got tired of the annoying noise. Decided to sell. We thought it would effect the value; but it didn't matter to the buyer. Glad to not be living next to wind towers.
BK4	Residential	Broker	Though sellers initally expressed concerns about the turbines affecting the price, it took only four months to sell a high-end rural home. Agent doesn't think there was any effect on the price.
BK5	Residential	Broker	Really noisy. Distracts some buyers. Limited acreages in the market. Doesn't seem to be a negative effect on the price. Distance from Brookings is more of a concern to buyers than the wind towers.
BK5	Residential	Buyer	Can be noisy, but didn't matter to us when we purchased the home. Paid the same. No issues.
BK6	AG	Broker	Sales and manages properties with wind towers. Doesn't seem to affect the price or ability to get market rents. There are issues with towers. Can't aerial spray. Breaks up the land; can't plant straight rows. Some guys like them; some don't. It really comes down to a personal decision.
BK7	Residential	Buyer	No affect on value. Property value has increased. Proximity to towers doesn't matter. Little bit of noise when working in the yard. No affect to animals. No concerns or issues.
BK8	AG	Buyer	No issues or concerns. Cattle don't care about the noise. Purchased the land on a CFD and paid market price with towers located on the quarter and no wind payment. No difference in price to me.

Interview Summary Table (continued)			
Interview Reference	**Property Type**	**Participant**	**Interview Summary Comments**
BK9	AG	Buyer	Has over 47 towers located on various ground. Lives near towers, too. Issues with lightning strikes and shattered blades. The company does not clean up well. Good wind payments. Have some towers that pay $12,000/year. Increases land value with wind payments. No affect with land without payments. People who complain are not getting the payments. Just purchased another 152 acres with a wind tower with no payment. Doesn't affect the price as long as you can farm it and there are no affects with yields.
BK12	AG	Broker	Managed auction with wind payments from two towers. Pasture land sold to adjoining land owner. Wind payments $12,373 per year. Property sold in 2018 for $616,000. Wind payments alone are approximately a 2% return and you still can lease or use the property. Believes sale price was positively influenced by the wind payments. No issues with pasture land; have had some issues with tillable ground. Can't plant straight rows, no aerial spraying and can't hunt around the towers. You can hear them run if you are near a tower. Payments offset the hassles with towers.
JD13	AG	Broker	Managed a pasture land auction with towers. Wind lease with 43 years remaining and a 1% annual increase. Land sold for a 10%-15% premium according to auctioneer. Some restrictions because of the towers. You can't shoot around them. Noisy and limits aerial applications.
BKGH	Residential	Seller	Trying to sell a house within the proposed project area. Currently listed on MLS. Had an offer on the property, but believes the disclosure of the proposed wind project near the property ended the deal.
BKDJ	Residential	Owner	Built retirement home prior to the wind project. Towers within 1,000 ft of property on all sides. Noisy. Shadow and flicker effect during certain times of the day. Have to deal with constant noise. Some days louder than others, depending of direction on the wind. Believes the towers are effecting his ability to sell the property.
BKBB	Residential	Owner	Purchased home prior to the wind project. There are periods of the day when there is a shadow effect depending on the angle of the sun. Best way to describe it is like a camera flash. The curtains in the house have to be closed during the flicker times. The flash scares the horses. The red lights, light up the night sky and destroy star gazing. The house was listed for sale and most potential buyers drove away when they saw how close the towers are to the house. The wind company over promised and under delievered.

SALES ANALYSIS BK1		
	SALE No.	BK1
	STATE	South Dakota
	COUNTY	Brookings

Property Characteristics:

Highest & Best Use:	Rural Acreage
Land Size:	8 Acres
Improvements:	2003 Ranch modular design
Finished Area:	2,356 S.F. GLA, 300 S.F. Lower Level
Garage:	Attached 2-Stall
Features:	Treed shelter belt. (2) Pole buildings 40x96 & 34x50
Access:	Gravel road linkage

Sales Analysis Data:

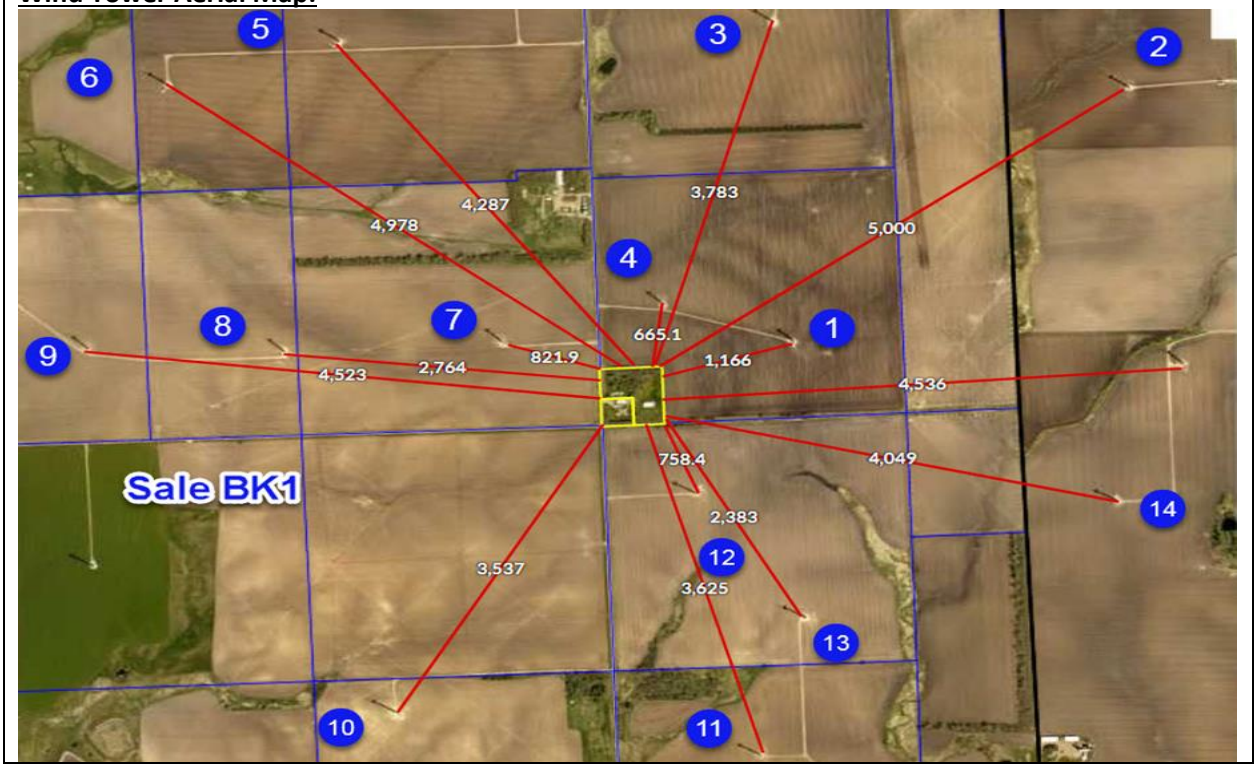
Date of Sale:	January 28, 2016
Market Exposure:	MLS
Listing Price:	$218,000
Sale Price:	$183,000
Verification:	Deed; Beacon; Interview with Broker
Type:	Arm's Length Sale
DOM:	153

Wind Project:

Project:	Buffalo Ridge
Turbine Type:	Gamesa G87 2.0 MW
Hub Height/Rotor Diameter:	78/87 meters
Height from Ground:	399 feet
Wind Tower Property Notes:	Encompassed by 14 wind turbines circling the property. Tower #1 1,200 +/- feet to the east. Tower #2 5,000 +/- feet to the northeast. Tower #3 3,800 +/- feet to the north. Tower #4 665 +/- feet to the north. Tower #5 4,300 +/- feet to the northwest. Tower #6 5,000 +/-

feet to the northwest. Tower #7 800 +/- feet west. Tower #8 2,700 +/- feet west. Tower #9 4,500 +/- feet southwest. Tower #10 3,500 +/- feet southwest. Tower #11 3,600 +/- feet southeast. Tower #12 750 +/- feet southeast. Tower #13 2,400 +/- feet southeast. Tower #14 4,000 +/- feet southeast.

Wind Tower Aerial Map:



Appreciation Analysis:

(Influenced by Tower) Sale 1 Bk1:	October 30, 2009	$166,000
(Influenced by Tower) Sale 2 BK1:	January 28, 2016	$183,000
	6.24 Years	$23,000
BK1 Appreciation:	**$3,685/Year**	**1.64%/Year**
(Uninfluenced) Sale 1 486th:	December 7, 2004	$133,000
(Uninfluenced) Sale 2 486th:	October 11, 2013	$145,000
	9.25 Years	$12,000
486th Appreciation:	**$1,298/Year**	**.98%/Year**
(Uninfluenced) Sale 213th:	August 10, 2013	$266,000
(Uninfluenced) Sale 213th:	May 24, 2018	$290,903
	4.62 Years	$24,906
213th Appreciation:	**$5,390/Year**	**2.02%/Year**

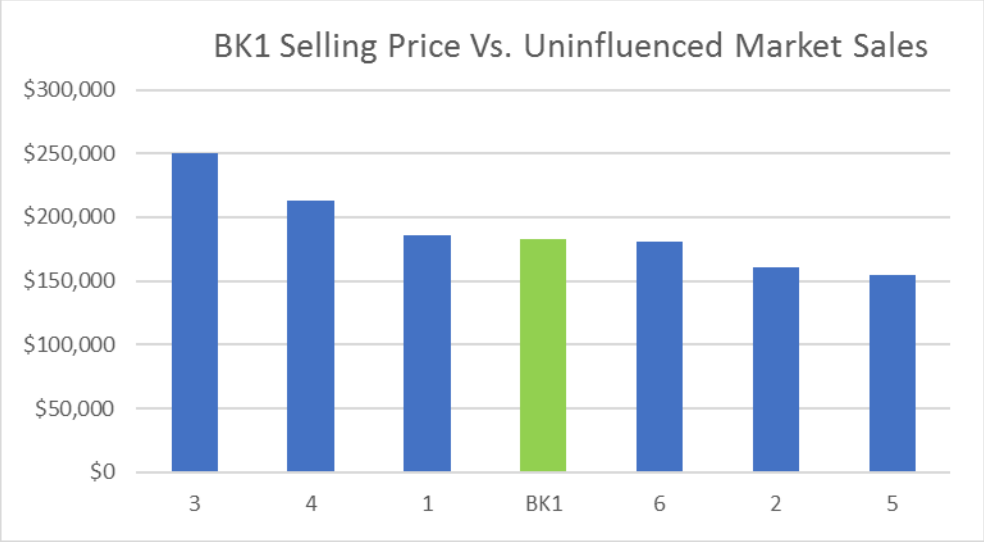
Conclusion:	Sale BK1 has market appreciation within the range of the market sales that are not influenced by a wind tower, turbine or wind project.

Site Analysis:	
Site Visit Conducted by:	David Lawrence
Site Visit Date:	May 23, 2018
View Obstruction:	Wind towers within view of residence
Noise Analysis:	Operational & blade noise present during site visit.
Interview Analysis:	
Interview Conducted by:	David Lawrence
Party Interviewed:	Broker
Interview Date:	May 28, 2018

Interview Notes with Broker:	This is the second time the broker has sold the property. The property sold within 150 days. The broker made sure to include pictures of the wind towers in the photos so potential buyers would be aware of the proximity. The broker stated that some potential buyers did not like the proximity of the wind turbines, while other potential buyers didn't care. There were more issues with the manufactured home design than concern for the wind towers. Broker stated the buyers liked the majestic beauty of the towers and there was no detrimental effect on the selling price because of the proximity of the wind towers.

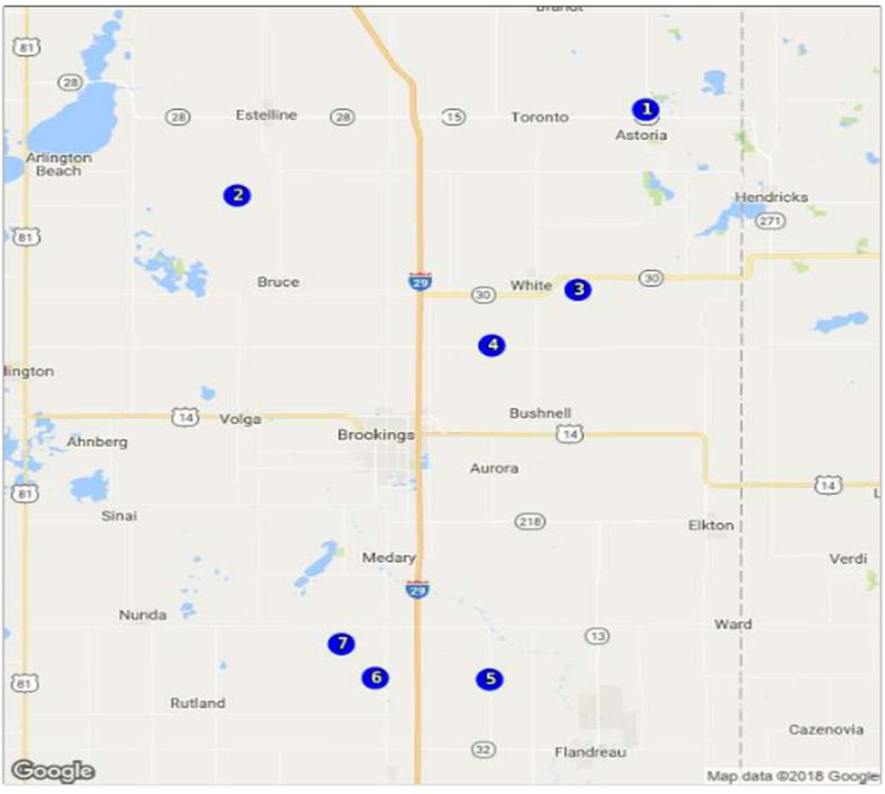
Interview Notes with Buyer:	The owner was not available during the site visit. I left a voice mail message; the owner did not return my phone call.

Market Sales Analysis:



Sales Analysis BK1									
Sale No.	Location	Sale Date	Price	Year/E.A.	GLA	Acres	Style	Outbuildings	Overall Analysis
BK1	Elkton	2016	$183,000	2003	2,356	8	Ranch	Pole Buildings	
1	Astoria	2015	$186,000	1910	1,472	14	Story1/2	Outbuildings	**Comparable**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Superior(-)*	*Similar (=)*	*Similar(=)*	
2	Bruce	2015	$161,000	1952	1,134	6.44	Ranch	1-car garage	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Similar(=)*	*Similar(=)*	*Inferior (+)*	
3	White	2015	$250,000	2010	1,518	22.48	Ranch	Barn/Guest House	**Superior**
			Adjustments:	*Superior(-)*	*Inferior (+)*	*Superior(-)*	*Similar(=)*	*Superior(-)*	
4	Aurora	2016	$213,000	1910	1,140	12.37	Story 1/2	Pole Building/Barn	**Comparable**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Superior(-)*	*Similar(=)*	*Similar(=)*	
5	Colman	2015	$155,000	1979	1,568	3.13	Ranch	Quonset/Garage	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior(+)*	*Inferior(+)*	*Similar(=)*	*Inferior(+)*	
6	*Colman*	*2015*	*$180,400*	*1961*	*2,240*	*10*	*Ranch*	*Barn/Outbuildings*	**Comparable**
			Adjustments:	*Similar(=)*	*Similar(=)*	*Similar(=)*	*Similar(=)*	*Similar(=)*	

Sale Location Map:



Legend	
1. 19367 483RD AVE, Astoria, SD 57213(13-122)	5. 22603 476th Ave., Flandreau, SD 57028(14-156)
2. 19851 464th Avenue, Bruce, SD 57220(15-394)	6. 47023 226th Street, Colman, SD 57071(15-368)
3. 20383 480TH AVE, White, SD 57276(15-434)	7. 22409 468th Avenue, Colman, SD 57017(15-39)
4. 47594 207th St, Aurora, SD 57002(16-467)	

Market Sales Analysis Conclusion:	Seven sales are from the market without the influence of a wind tower. All transactions have similar highest and best use and are bracketed by the market sales. Sales one, four and six have stronger similarities for comparison and bracket the range of BK1. The market evidence suggests the selling price was not affected by the proximity of the wind towers.

Overall Conclusion:	An interview analysis, site observation, and sales analysis were completed for BK1. The research and data suggest the proximity of the wind towers did not influence the selling price. Sale BK1 sold in 2009 and then resold in 2016 with a market appreciation rate within the range of other uninfluenced sales not in the proximity of a wind tower. Even though there are visual & noise effects observed during the site visit, the interview and market data suggest the proximity of the wind towers has not negatively influenced sale BK1.

SALES ANALYSIS BK2		
	SALE No.	BK2
	STATE	South Dakota
	COUNTY	Brookings

Property Characteristics:

Highest & Best Use:	Rural Acreage
Land Size:	10 Acres
Improvements:	1998 Story 1/2 design
Finished Area:	1,850 S.F. GLA, 1,004 S.F. Lower Level
Garage:	Attached 1-Stall
Features:	Treed shelter belt. Shed, storage building & hobby building
Access:	Paved highway linkage

Sales Analysis Data:

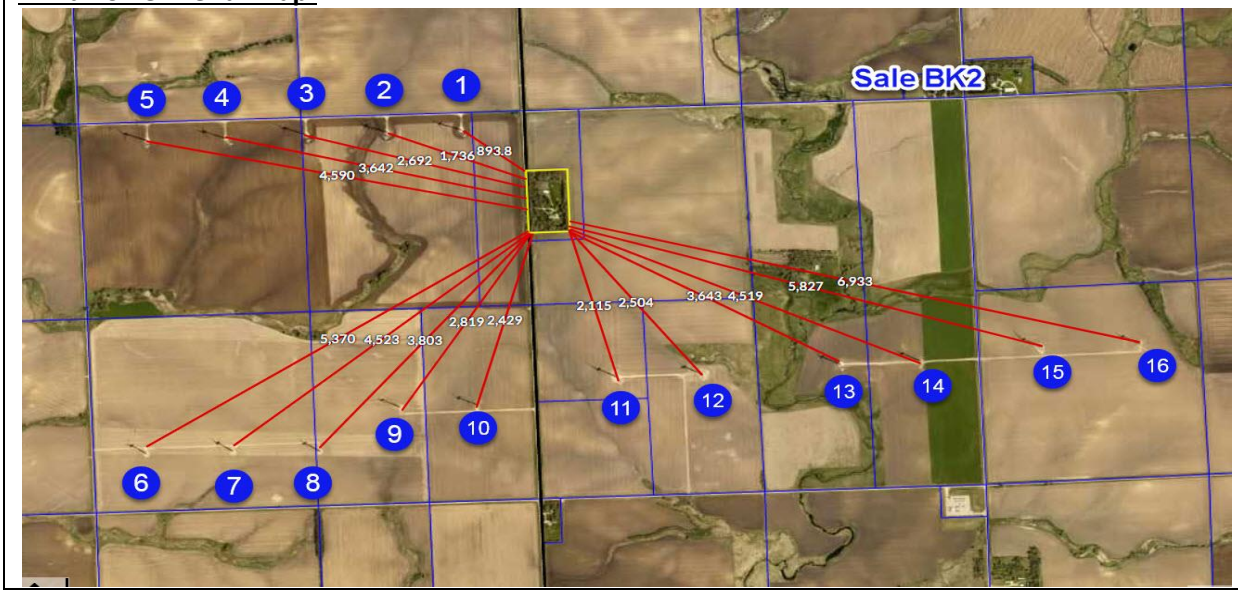
Date of Sale:	March 14, 2011
Market Exposure:	MLS
Listing Price:	$339,000
Sale Price:	$235,000
Verification:	Deed; Beacon; Interview with Buyer & Seller
Type:	Arm's Length Sale

Wind Project:

Project:	Buffalo Ridge
Turbine Type:	Gamesa G87 2.0 MW
Hub Height/Rotor Diameter:	78/87 meters
Height From Ground:	399 feet
Property & Wind Tower Notes:	Encompassed by 16 wind turbines. Tower #1 890 +/- feet northwest. Tower #2 1,700 +/- feet northwest. Tower #3 2,700 +/- feet northwest. Tower #4 3,600 +/- feet northwest. Tower #5 4,600 +/- feet northwest. Tower #6 5,400 +/- feet southwest. Tower #7 4,500 +/- feet southwest. Tower #8 3,800 +/- feet southwest. Tower #9 2,800 +/- feet southwest. Tower #10 2,400 +/- feet south. Tower #11 2,100 +/- feet southeast.

	Tower #12 2,500 +/- feet southeast. Tower #13 3,600 +/- feet southeast. Tower #14 4,500 +/- feet. Tower #15 5,800 +/- feet southeast. Tower #16 7,000 +/- feet southeast.

Wind Tower Aerial Map:



Site Analysis:

Site Visit Conducted by:	David Lawrence
Site Visit Date:	May 23, 2018
View Obstruction:	Wind towers within view of residence
Noise Analysis:	Operational & blade noise present during site visit.

Interview Analysis:

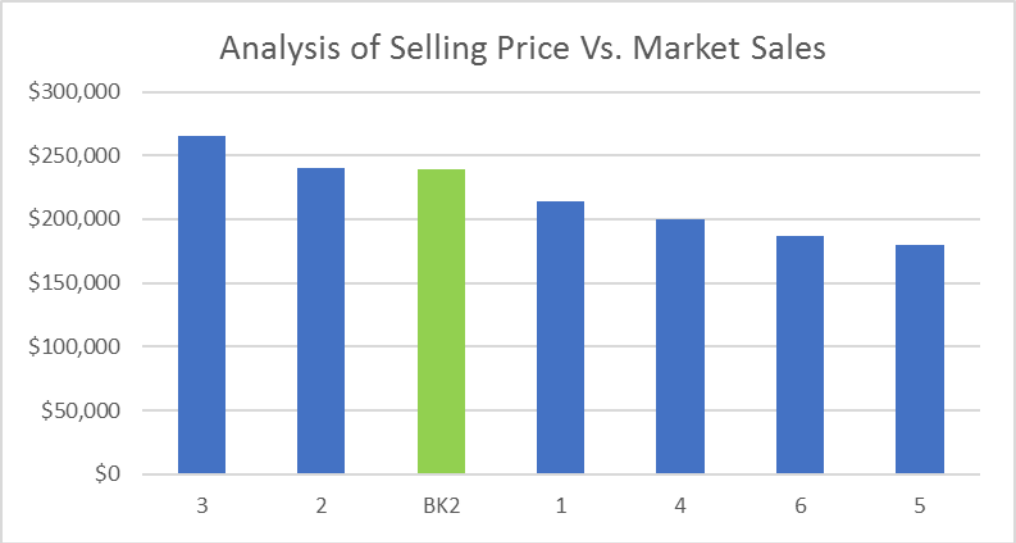
Interview Conducted by:	David Lawrence
Party Interviewed:	Buyer & Seller
Interview Date Buyer:	May 28, 2018
Interview Date Seller:	April 11, 2018

Interview Notes with Buyer:	The home was purchased with the assistance of a real estate agent. Towers were in place at the time of purchase. Turbines surrounding the property didn't affect purchase decision or price paid; although they would prefer not to have them. Some flicker effect and noise. Haven't noticed any health effects. When they purchased the home, there was an encumbrance on the title for a wind easement they had to work with the seller to clean up before closing.

Interview Notes with Seller:	(Interview performed by Northern Plains Appraisal) Sellers desired their privacy and would only allow an interview with NPA. Seller stated when they sold the house, they couldn't get the listing price of $339,000, the price was lowered and sold it for what they could. They also owned the adjoining land around the home. The buyer did not

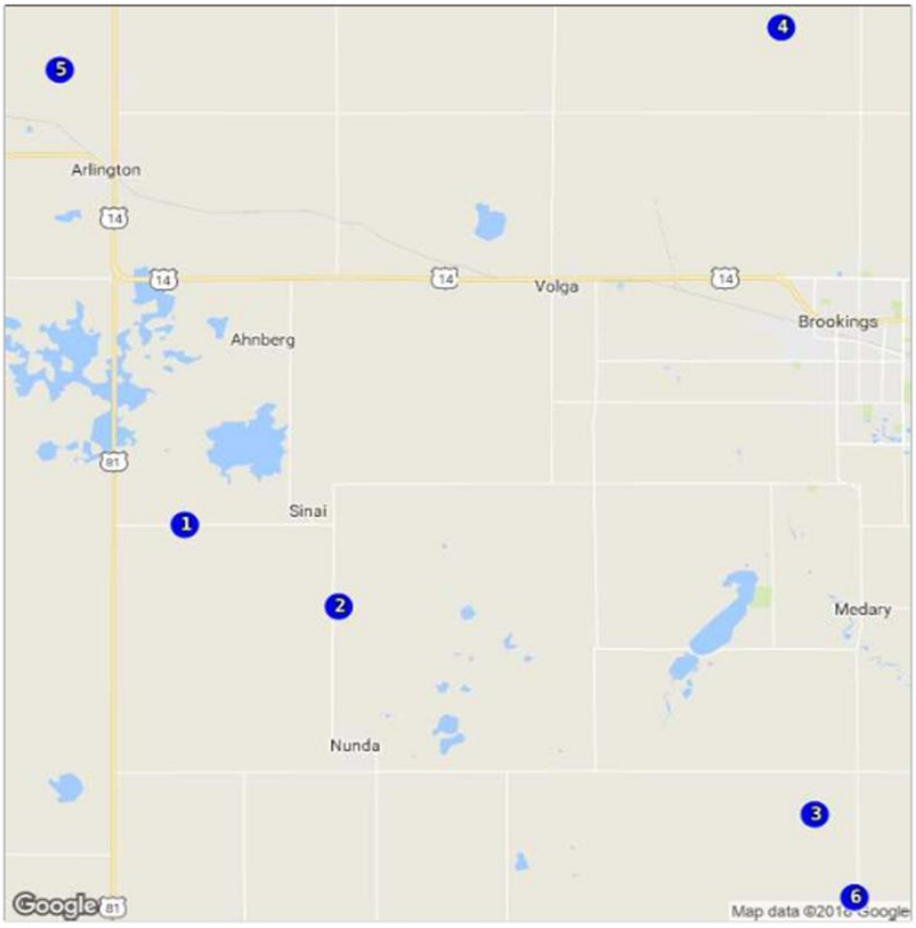
	want any wind towers near the house and therefore had a condition of sale not to sign a wind lease. Seller stated it was difficult to find a buyer, but they were satisfied with the purchase price. Seller stated you could feel the vibrations in the air and towers create issues with the body. They are glad they do not live around wind towers.

Market Sales Analysis:



Sales Analysis BK2									
Sale No.	**Location**	**Sale Date**	**Price**	**Year/E.A.**	**GLA**	**Acres**	**Style**	**Outbuildings**	**Overall Analysis**
BK2	**Toronto**	**2011**	**$239,000**	**1998**	**1,850**	**10**	**Story 1/2**	**Shed/Storage Bld**	
1	Arlington	2009	$214,000	2007	1,748	13	Ranch	Barn/Shed/2car	**Comparable**
			Adjustments:	*Similar(=)*	*Similar(=)*	*Similar(=)*	*Similar (=)*	*Similar(=)*	
2	Volga	2012	$240,000	1983	1,784	4.5	Ranch	Shed/Pole	**Comparable**
			Adjustments:	*Similar(=)*	*Similar(=)*	*Inferior(+)*	*Similar(=)*	*Similar(=)*	
3	Colman	2009	$265,000	2006	1,500	9.88	Ranch	Barn/2Car/Shed	**Superior**
			Adjustments:	*Superior (-)*	*Inferior (+)*	*Similar(=)*	*Similar(=)*	*Superior(-)*	
4	Brookings	2011	$200,000	1949	1,344	9.75	Story1/2	Barn/Shed	**Inferior**
			Adjustments:	*Inferior(+)*	*Inferior (+)*	*Similar(=)*	*Similar (=)*	*Similar(=)*	
5	Arlington	2011	$180,000	1917	1,510	11.79	Story1/2	2cGarage/Sheds	**Inferior**
			Adjustments:	*Inferior(+)*	*Inferior(+)*	*Similar(=)*	*Similar(=)*	*Similar(=)*	
6	*Volga*	*2011*	*$187,000*	*1954*	*1,491*	*5*	*Story1/2*	*Outbuildings*	**Inferior**
			Adjustments:	*Inferior(+)*	*Inferior(+)*	*Inferior (+)*	*Similar(=)*	*Similar(=)*	

Sale Location Map:



Legend	
1. 45674 217th St, Arlington, SD 57002(09-653)	4. 46922 205TH ST, Brookings, SD 57006(11-219)
2. 45916 219TH ST, Volga, SD 57071(12-313)	5. 45279 206TH ST, Arlington, SD 57212(11-307)
3. 22406 470th Ave, Colman, SD 57017(09-852)	6. 22609 471ST AVE, Colman, SD 57017(11-511)

Market Sales Analysis Conclusion:	The analysis uses six sales from the Brookings market with similar highest and best use. All sales are without the influence of a wind tower in proximity to the property. Sales one and two are the most similar sales and bracket the selling price of the subject. The remaining sales provide further market support of the selling range of market substitutes. After analyzing the elements of comparison, sale BK2 is within the range of the uninfluenced market sales. The data suggests the wind towers did not negatively influence the selling price.

Overall Conclusion:	An interview analysis, site visit, and sales analysis have been completed for BK2. During the site visit, wind tower noise was present on the on the property. The buyer interview indicated this was not a factor during

	the buying process. There are inconsistencies between the seller interview and the buyer interview; however, the sales data and the buyer's interview comments are consistent. The evidence suggests the proximity of the wind towers did not negatively influence the purchase price.

SALES ANALYSIS BK3		
	SALE No.	BK3
	STATE	South Dakota
	COUNTY	Brookings

Property Characteristics:

Highest & Best Use:	Rural Acreage
Land Size:	14.28 Acres
Improvements:	1918 Story 1/2 design
Finished Area:	2,208 S.F. GLA
Garage:	Attached 2-Stall
Features:	Treed shelter belt. Shed, storage building
Access:	Paved highway linkage

Sales Analysis Data:

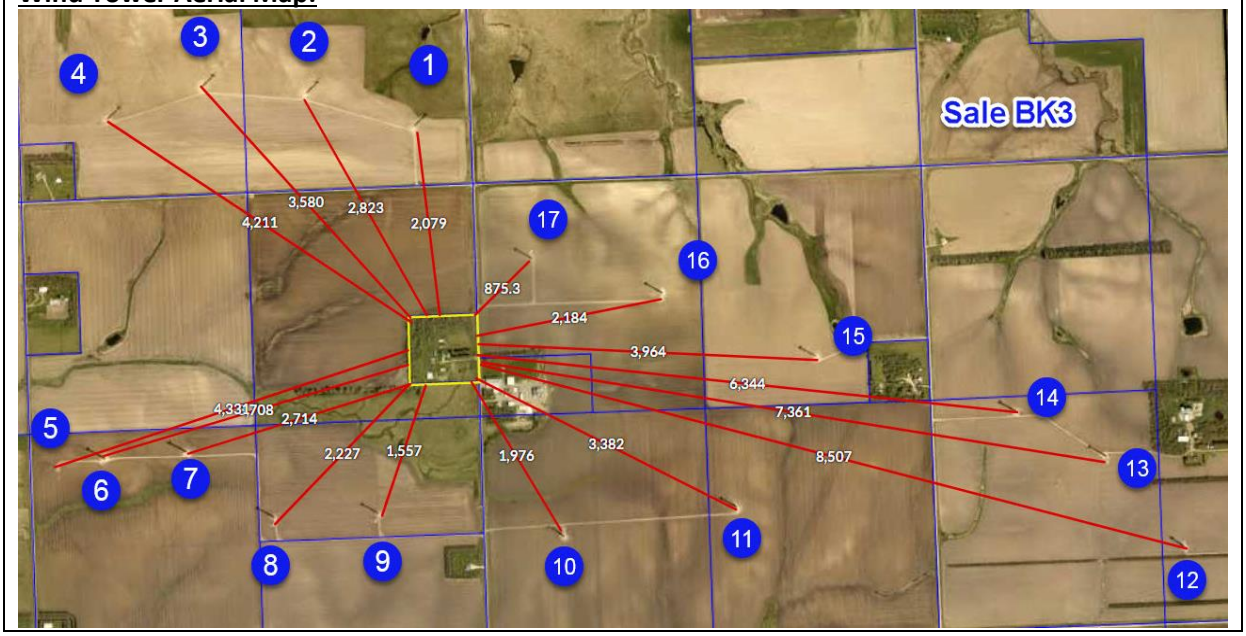
Date of Sale:	December 06, 2011
Market Exposure:	MLS
Listing Price:	$189,000
Sale Price:	$175,000
Verification:	Deed; Beacon; Interview with Buyer & Agent
Type:	Arm's Length Sale

Wind Project:

Project:	Buffalo Ridge
Turbine Type:	Gamesa G87 2.0 MW
Hub Height/Rotor Diameter	78/87 meters
Height From Ground:	399 feet
Wind Tower Property Notes:	Tower # 1 2,000 +/- feet north. Tower #2 2,800 +/- feet northwest. Tower #3 3,600 +/- feet northwest. Tower #4 4,200 feet +/- northwest. Tower #5 4,300 +/- feet southwest. Tower #6 3,700 +/- feet southwest. Tower #7 2,700 +/- southwest. Tower #8 2,200 +/- feet southwest. Tower #9 1,500 +/- feet south. Tower #10 1,900 +/- feet southeast.

	Tower #11 3,400 +/- feet southeast. Tower #12 8,500 +/- southeast. Tower #13 7,400 +/- feet southeast. Tower #14 6,400 +/- feet east. Tower #15 4,000 +/- feet east. Tower #16 2,100 +/- northeast. Tower #17 875 +/- feet northeast.

Wind Tower Aerial Map:



Site Analysis:

Site Visit Conducted by:	David Lawrence
Site Visit Date:	May 23, 2018
View Obstruction:	Wind towers within view of residence
Noise Analysis:	Operational & blade noise present during site visit.

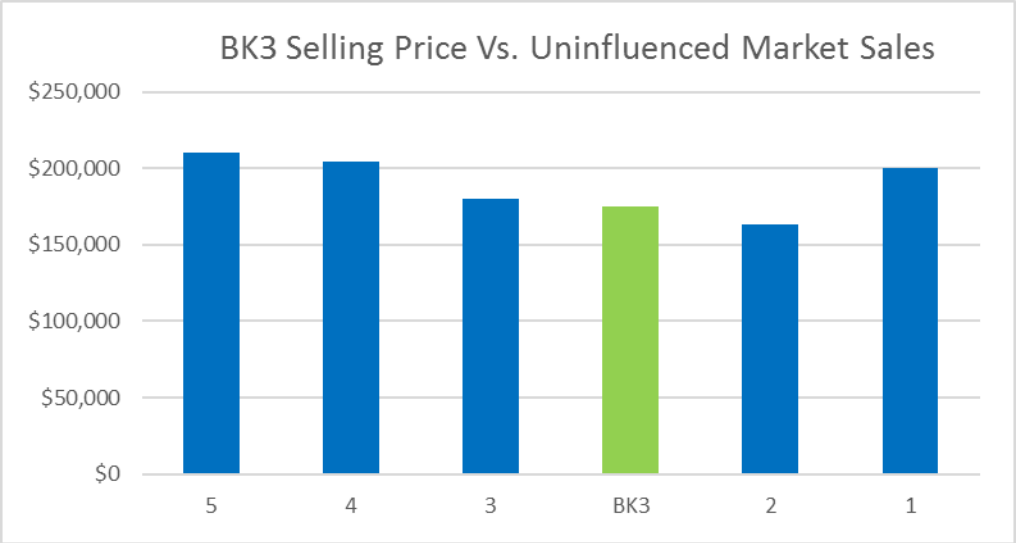
Interview Analysis:

Interview Conducted by:	David Lawrence
Party Interviewed:	Buyer & Agent
Interview Date:	May 23, 2018 (Buyer) May 28, 2018 (Agent)

Interview Notes with Buyer:	The buyer was interested in the property because of the proximity to work. When the agent showed the property, the wind towers were not a factor in their purchase decision. Paid the same even though they do not like the noise and could see the towers from the house. Buyer stated the wind towers could be loud when you are working in the yard.

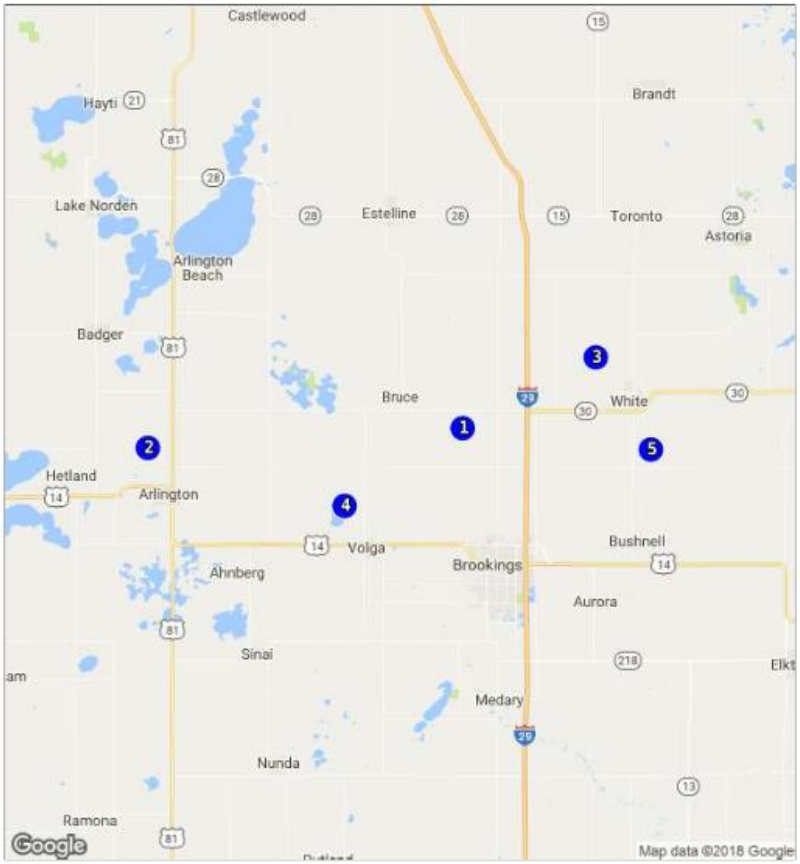
Interview Notes with Agent:	There is high demand for acreages in the Brookings market. Most buyers do not care about the wind towers. Buyers are looking for the features of an acreage. Although there have been potential buyers, some buyers refuse to look at a property near wind towers. The price seems unaffected by properties I've sold near wind towers.

Market Sales Analysis:



Sales Analysis BK3									
Sale No.	Location	Sale Date	Price	Year/E.A.	GLA	Acres	Style	Outbuildings	Overall Analysis
BK3	**Elkton**	**2011**	**$175,000**	**1918**	**2,208**	**14.28**	**Story 1/2**	**Shed/Storage Bld**	
1	Brookings	2011	$200,000	1949	1,344	9.75	Story1/2	Barn/Shed	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Inferior(+)*	*Similar (=)*	*Similar(=)*	
2	White	2009	$163,000	1910	1,762	3.84	Story 1/2	Barn/Shed	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Inferior(+)*	*Similar (=)*	*Similar(=)*	
3	Arlington	2011	$180,000	1917	1,510	11.79	Story1/2	2cGarage/Sheds	**Comparable**
			Adjustments:	*Similar(=)*	*Inferior(+)*	*Similar(=)*	*Similar(=)*	*Similar(=)*	
4	Volga	2011	$204,000	1910	2,294	12.65	Story1/2	Barn/Shed/2car	**Comparable**
			Adjustments:	*Similar(=)*	*Superior(-)*	*Similar(=)*	*Similar (=)*	*Similar(=)*	
5	White	2012	$210,500	1938	2,405	17.12	Story1/2	Shed/Pole	**Superior**
			Adjustments:	*Similar(=)*	*Superior(-)*	*Superior(-)*	*Similar(=)*	*Similar(=)*	

Sale Location Map:



Legend
1. 46922 205TH ST, Brookings, SD 57006(11-219)
2. 45279 206TH ST, Arlington, SD 57212(11-307)
3. 47612 201ST ST, White, SD 57276(09-474)
4. 46306 209TH ST, Volga, SD 57071(11-436)
5. 20608 479th Ave., White, SD 57276(12-315)

Market Sales Analysis Conclusion:	Five sales are analyzed in the sales grid from the market area. All sales are uninfluenced by the proximity of a wind tower. Sales one and two are inferior sales and bracket the lower end of the range. Sale five is superior and brackets the higher end of the range. Sales three and four have stronger similarities. After considering the differences in the elements of comparison, the market evidence indicates the selling price was not negatively influenced by the proximity of the wind towers.

Overall Conclusion:	An interview analysis, site visit and sales analysis has been completed for BK3. Although the buyer commented about the noise and view obstructions, the market evidence is consistent with the interview comments. The evidence suggests the overall purchase price was not negatively influenced by the proximity of the wind tower.

SALES ANALYSIS BK4		
	SALE No.	BK4
	STATE	South Dakota
	COUNTY	Brookings

Property Characteristics:

Highest & Best Use:	Rural Acreage
Land Size:	13 Acres
Improvements:	1989 Story ½
Finished Area:	2,728 SF GLA; 4500 SF Finished (Updated)
Garage:	Attached 3-Stall
Features:	Treed shelter belt. 50x112 & 160x120 Commercial Building
Access:	Gravel road linkage; paved driveway

Sales Analysis Data:

Date of Sale:	November 21, 2013
Market Exposure:	MLS
Listing Price:	$569,000
Sale Price:	$530,000
Verification:	Deed; Beacon; Interview with buyer, seller & agent
Type:	Arm's Length Sale
DOM:	117 days

Wind Project:

Project:	Buffalo Ridge
Turbine Type:	Gamesa G87 2.0 MW
Hub Height/Rotor Diameter:	78/87 meters
Height From Ground:	399 feet.
Property & Wind Tower Notes:	Tower #1 10,500 +/- feet east. Tower #2 9,200 +/- feet east. Tower #3 7,700 +/- feet southeast. Tower #4 6,500 +/- feet southeast. Tower #5 5,400 +/- feet southeast. Tower #6 4,100 +/- feet southeast. Tower #7

	3,100 +/- feet southeast. Tower #8 2,400 +/- feet southeast. Tower #9 1,800 +/- feet south, southeast.

Wind Tower Aerial Map:

Site Analysis:

Site Visit Conducted by:	David Lawrence
Site Visit Date:	May 23, 2018
View Obstruction:	Wind towers within view of residence
Noise Analysis:	Operational & blade noise present during site visit.

Interview Analysis:

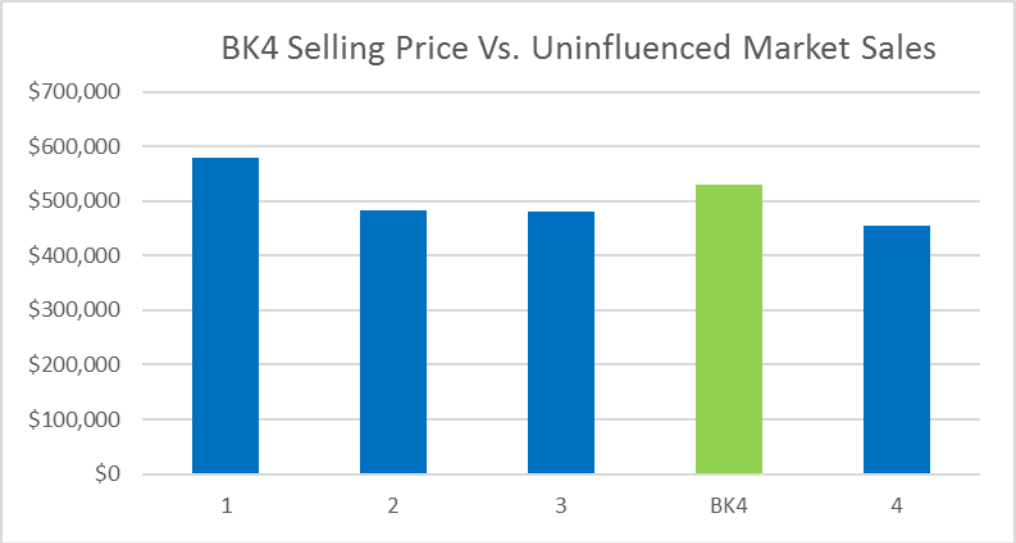
Interview Conducted by:	David Lawrence
Party Interviewed:	Buyer, Seller & Agent
Interview Date Buyer:	May 23, 2018
Interview Date Seller:	May 24, 2018
Interview Date Agent:	May 29, 2018

Interview Notes with Buyer:	Proximity to wind turbines didn't make a difference in the purchase. Paid the same. Purchased property because it had a perfect setup with a remodeled house and two metal buildings. Towers are south of the house, so it doesn't affect the view from the house. The towers make noise and you can hear them in the yard. Doesn't matter, happy with the purchase.

Interview Notes with Seller:	We moved because we were sick and tired of the wind tower noise. We thought it would matter when we sold, but a buyer purchased the house and never mentioned the wind towers. Didn't have any issues with closing or the appraisal. We are happy not to be living next to a wind tower.

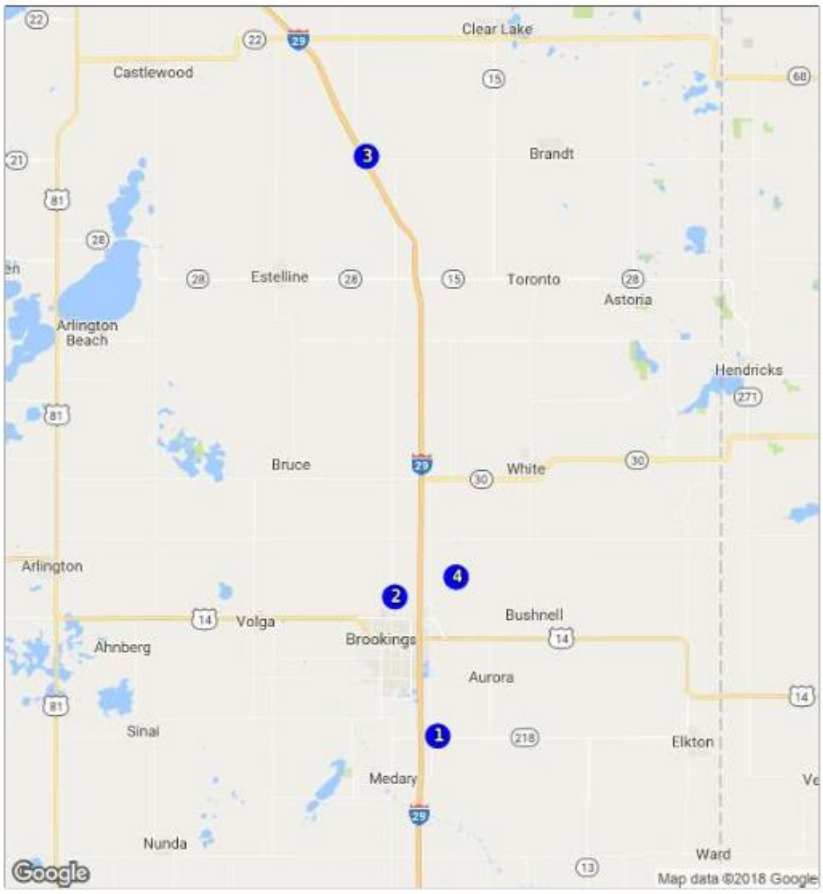
Interview Notes with Agent:	Although the sellers initially expressed concerns about the turbines, and it took four months to sell the property, the agent does not think there was any real effect with potential buyers and she did not hear that from any other realtors regarding this property. The home is an executive home and the market is smaller in that price range according to the agent.

Market Sales Analysis:



Sales Analysis BK4									
Sale No.	**Location**	**Sale Date**	**Price**	**Year/E.A.**	**GLA**	**Acres**	**Style**	**Outbuildings**	**Overall Analysis**
BK4	**Elkton**	**2013**	**$530,000**	**1989**	**2,728**	**13**	**Story 1/2**	**(2) Metal Buildings**	
1	Brookings	2016	$578,264	1920	3,365	39.87	Story1/2	Barn/Shed	**Superior**
			Adjustments:	*Inferior(+)*	*Superior(-)*	*Superior(-)*	*Similar (=)*	*Similar(=)*	
2	Brookings	2015	$482,500	2007	1,726	5	Ranch	Metal Building	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Inferior(+)*	*Similar (=)*	*Inferior(+)*	
3	Esteline	2016	$480,000	2003	2,651	4.99	Story1/2	Metal Buildings	**Inferior**
			Adjustments:	*Similar(=)*	*Similar(=)*	*Inferior(+)*	*Similar(=)*	*Similar(=)*	
4	Aurora	2010	$455,000	1890	3,342	15	Story1/2	Barn/Shed/2car	**Inferior**
			Adjustments:	*Inferior(+)*	*Superior(-)*	*Similar(=)*	*Similar (=)*	*Inferior(+)*	

Sale Location Map:



Legend
1. 47358 SD Highway 324, Brookings, SD 57006(16-276)
2. 1320 W 30TH ST, Brookings, SD 57006(14-381)
3. 46958 188TH ST, Estelline, SD 57234(15-251)
4. 47437 209th St, Aurora, SD 57002(10-196)

Market Sales Analysis Conclusion:	No sales could be found to bracket the selling price within the time of the transaction date; therefore, the sales search was expanded into 2017. Only one sale was found prior to the selling date in 2010. Sales one, two, and three occurred after the selling date in 2015 and 2016 and located near the city of Brookings. According the MLS data, BK4 was the highest sale price in 2013. The sale evidence suggests the selling price was not influenced by the proximity of the wind towers.

Overall Conclusion:	An interview analysis, site visit and sales analysis has been completed for BK4. The buyer's comments are consistent with the sales evidence. All evidence suggests the sale price was not affected by the proximity of the wind towers.

SALES ANALYSIS BK5		
	SALE No.	BK5
	STATE	South Dakota
	COUNTY	Brookings

Property Characteristics:

Highest & Best Use:	Rural Acreage
Land Size:	6.95 Acres
Improvements:	1936 Two-Story Design
Finished Area:	2,160 SF GLA. Basement 864 S.F.
Garage:	Attached 1-Stall
Features:	Treed shelter belt. Shed, storage building. Detached 1-Stall
Access:	Gravel linkage

Sales Analysis Data

Date of Sale:	March 26, 2014
Market Exposure:	MLS
Listing Price:	$219,000
Sale Price:	$190,000 (Previous sale 2010 $215,000)
Verification:	Deed; Beacon; Interview with Buyer
Type:	Arm's Length Sale

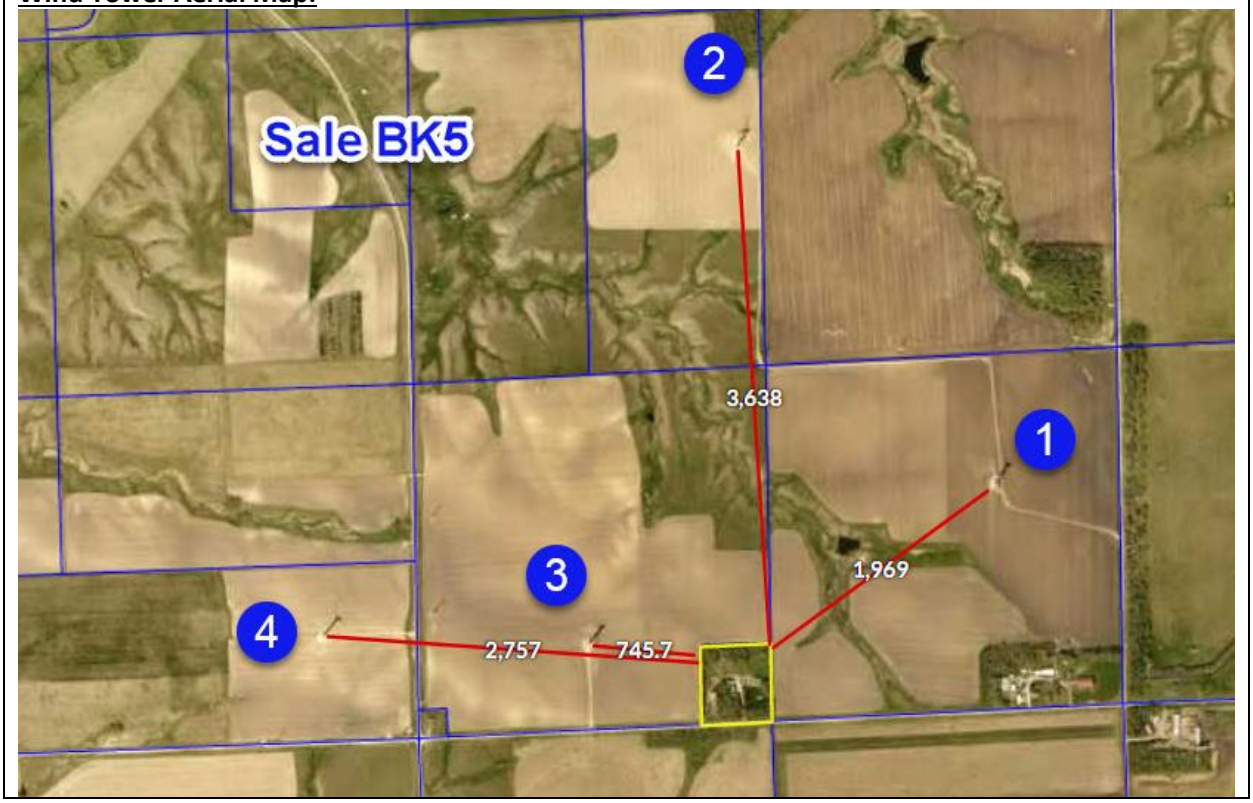
Wind Project:

Project:	Buffalo Ridge
Turbine Type:	Gamesa G87 2.0 MW
Hub Height/Rotor Diameter:	78/87 meters
Height From Ground:	399 feet
Property & Wind Tower Notes:	Four turbines located east, north and west. Tower #1 2,000 +/- feet northeast. Tower #2 3,600 +/- feet north. Tower #3 745 +/- feet west. Tower #4 2,700 +/- feet west.

Site Analysis:

Site Visit Conducted by:	David Lawrence
Site Visit Date:	May 23, 2018
View Obstruction:	Wind towers within view of residence
Noise Analysis:	None at time of site visit. (no wind present)

Wind Tower Aerial Map:



Interview Analysis:

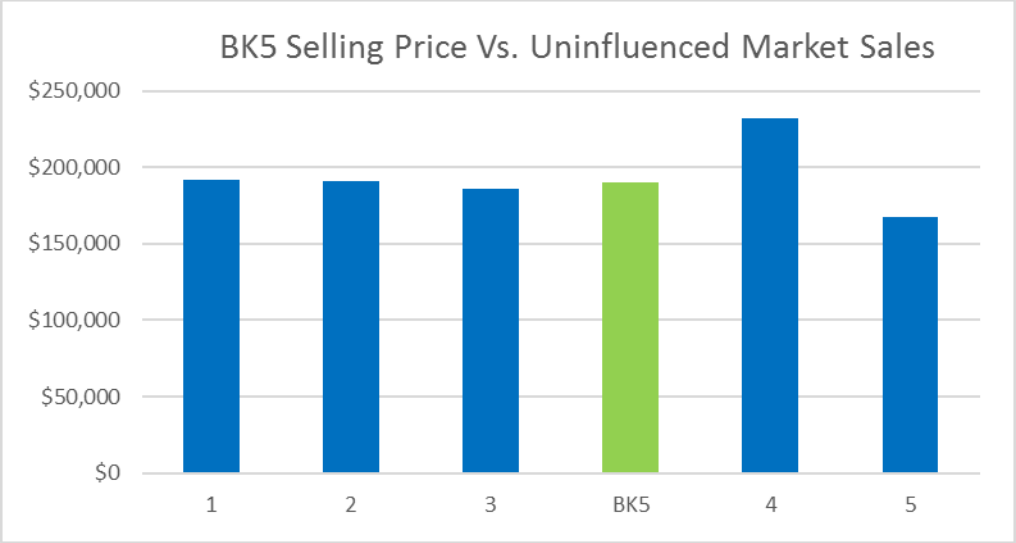
Interview Conducted by:	David Lawrence
Party Interviewed:	Buyer
Party Interviewed:	Agent
Interview Date:	May 23, 2018 (Buyer) May 30,2018 (Agent)

Interview Notes with Buyer:	Property was listed for 3 years and seller had two previous offers fall through; seller was living alone and motivated to sell. Made a good deal. Wind towers can be noisy but didn't matter to us when we bought the home. Really no issues, besides the noise. Doesn't seem to bother wild life, deer come in the yard while the turbines are running.

Interview Notes with Agent:	There are limited acreages within the Brookings market and if the property is in good condition with the features of an acreage, it sells. Lots of buyers looking for acreages. The price was reduced (BK5) because of a dysfunctional floor plan and seller motivations. The floor

	plan eliminated older buyers. Steep stairs. Old house and new house addition with weird layout. During the open house, buyers did not comment about the proximity of the wind towers, even though you can hear them in the yard. Distance from Brookings is what effects the price with acreages, not wind towers. If a property is past the 15-mile mark, price drops considerably. Price/distance relationship. Closer to Brookings prices increase. Acreage buyers are young people with kids. Lots of work to maintain an acreage. If it is too far from town, less buyers. No negative effects on purchase price from wind towers. Buyers did not seem to comment or raise concerns.

Market Sales Analysis:



Sales Analysis BK5									
Sale No.	**Location**	**Sale Date**	**Price**	**Year/E.A.**	**GLA**	**Acres**	**Style**	**Outbuildings**	**Overall Analysis**
BK5	**Elkton**	**2014**	**$190,000**	**1936**	**2,160**	**6.95**	**Story 1/2**	**Shed/Storage Bld**	
1	Flandreau	2014	$191,900	1880	1,950	8.95	Story1/2	Barn/Shed	**Comparable**
			Adjustments:	*Similar(=)*	*Similar(=)*	*Similar(=)*	*Similar (=)*	*Similar(=)*	
2	Volga	2015	$190,600	1918	1,680	15	Story 1/2	Barn/Shed	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Superior(-)*	*Similar (=)*	*Inferior(-)*	
3	Astoria	2014	$186,000	1910	1,472	14	Story1/2	Outbuildings	**Comparable**
			Adjustments:	*Similar(=)*	*Inferior(+)*	*Superior(-)*	*Similar(=)*	*Similar(=)*	
4	Brookings	2013	$232,000	1912	2,075	30.59	Story1/2	Barn/Shed/2car	**Superior**
			Adjustments:	*Similar(=)*	*Inferior(+)*	*Superior(-)*	*Similar (=)*	*Superior(-)*	
5	Nunda	2013	$167,900	1922	1,198	14.63	Story1/2	Shed/Barn/Metal	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior(+)*	*Superior(-)*	*Similar(=)*	*Superior(-)*	

Sale Location Map:

Legend
1. 22603 476th Ave., Flandreau, SD 57028(14-156)
2. 19367 483RD AVE, Astoria, SD 57213(13-122)
3. 612 Wicklow Ln, Brookings, SD 57006(13-312)
4. 22125 457th Ave., Nunda, SD 57050(13-147)
5. 46464 218TH ST, Volga, SD 57071(14-579)

Market Sales Analysis Conclusion:	Five sales uninfluenced by the proximity of wind towers are used for the analysis. The sales have similar highest and best use as acreages in the Brookings rural market. Sale BK5 is bracketed by the market sales. Sales two and five are inferior sales. Sale four is a superior sale. Sales one and three are the most similar. The market evidence suggests the selling price of BK5 was not influenced by the proximity of the wind towers.

Overall Conclusion:	An interview analysis, site visit, and sales analysis have been completed for sale BK5. The buyer's comments indicated the purchase price was influenced by seller motivations and not by the presence of the wind towers. The market data is consistent with the interview analysis and suggests the proximity of the wind towers did not negatively influence the selling price of BK5

SALES ANALYSIS BK7		
	SALE No.	BK7
	STATE	South Dakota
	COUNTY	Brookings

Property Characteristics:

Highest & Best Use:	Rural Acreage
Land Size:	13.35 Acres
Improvements:	1992 Ranch
Finished Area:	1680 SF GLA; 1680 L.L.
Garage:	Attached 2-Stall
Features:	Treed shelter belt. Metal outbuilding
Access:	Gravel road linkage

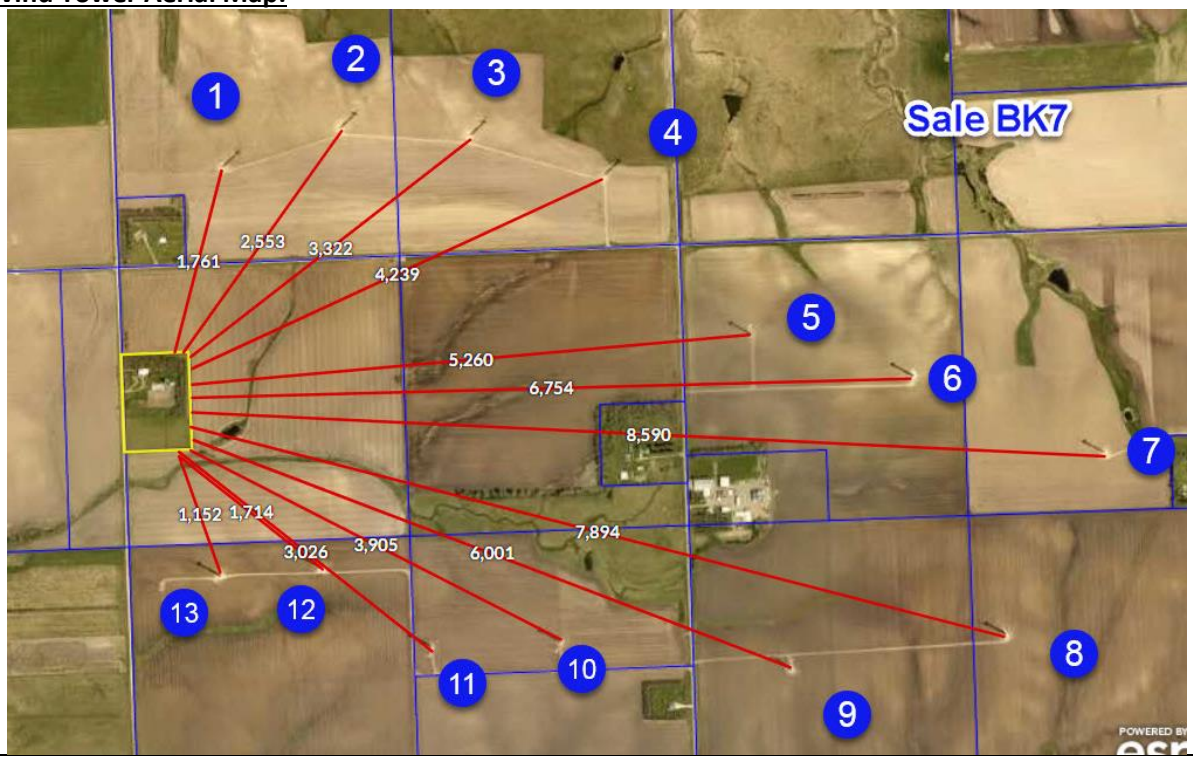
Sales Analysis Data:

Date of Sale:	August 4, 2010
Market Exposure:	Word of mouth
Sale Price:	$180,000
Verification:	Deed; Beacon; Interview with Buyer
Type:	Arm's Length Sale (estate sale, purchased based on appraisal)

Wind Project:

Project:	Buffalo Ridge
Hub Height/Rotor Diameter:	78/87 meters
Height from Ground:	399 feet
Wind Tower Property Notes:	Thirteen wind turbines surround the property. Tower #1 1,800 +/- feet north. Tower #2 2,500 +/- feet northeast. Tower #3 3,300 +/- feet northeast. Tower #4 4,200 +/- feet northeast. Tower #5 5,200 +/- feet northeast. Tower #6 6,700 +/- feet east. Tower #7 8,500 +/- feet east. Tower #8 7,900 +/- feet southeast. Tower #9 6,000 +/- feet southeast. Tower #10 3,900 +/- feet southeast. Tower #11 3,000 +/- feet southeast. Tower #12 1,700 +/- feet southeast. Tower #13 1,100 +/- feet south

Wind Tower Aerial Map:

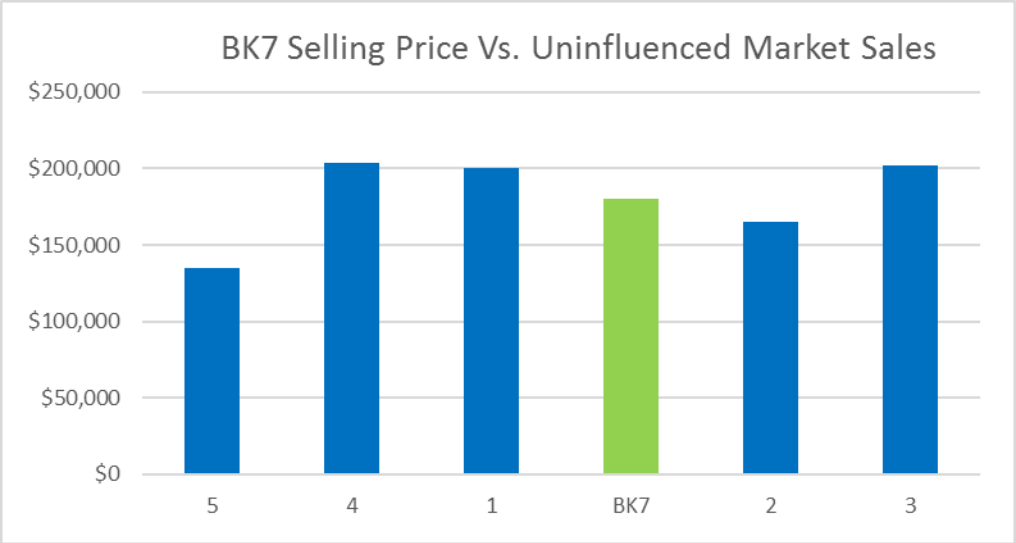


Site Analysis:	
Site Visit Conducted by:	David Lawrence
Site Visit Date:	May 23, 2018
View Obstruction:	Wind towers within view of residence
Noise Analysis:	Operational & blade noise present during site visit.

Interview Analysis:	
Interview Conducted by:	David Lawrence
Party Interview:	Buyer
Interview Date Buyer:	May 30, 2018

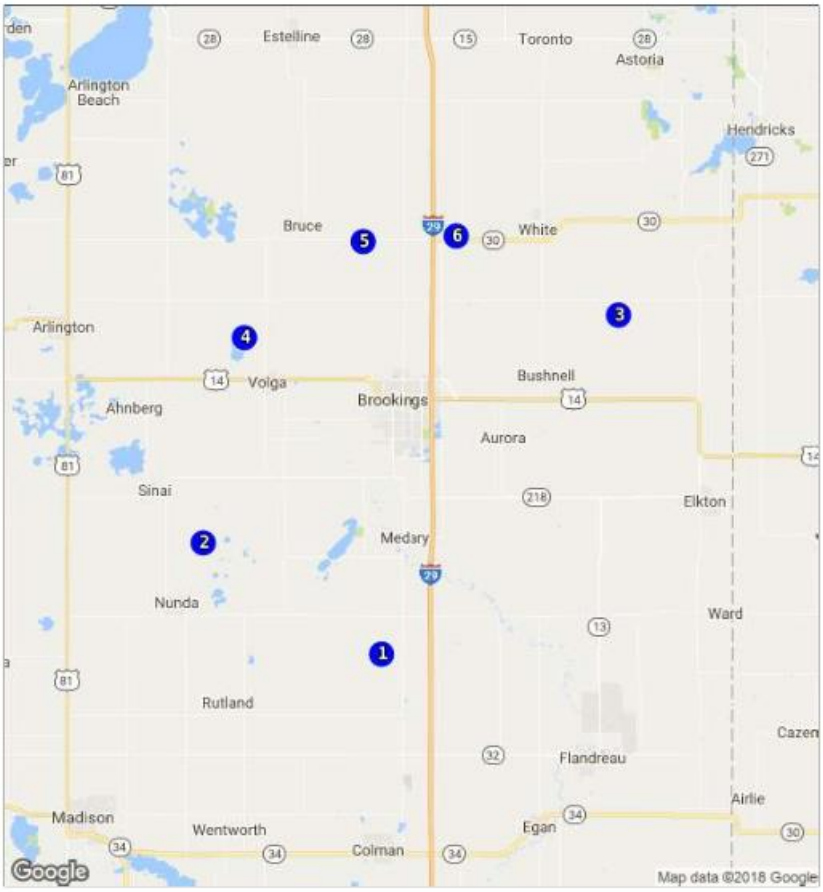
Interview Notes with Buyer:	Property value has increased by at least $75,000 since purchase. No issues or concerns with living near wind towers. There is no effect on the value. No effect to the animals. Can hear a faint “swoosh” noise. No big deal.

Market Sales Analysis:



Sales Analysis BK7									
Sale No.	Location	Sale Date	Price	Year/E.A.	GLA	Acres	Style	Outbuildings	Overall Analysis
BK7	**Elkton**	**2010**	**$180,000**	**1992**	**1,680**	**13.35**	**Ranch**	**Outbuild/2Car**	
1	Volga	2011	$200,000	2005	1,232	10	Ranch	Barn/2Car	**Superior**
			Adjustments:	*Superior(-)*	*Inferior(+)*	*Superior(-)*	*Similar (=)*	*Similar(=)*	
2	Colman	2009	$165,000	2001	910	22.03	Ranch	None	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior (+)*	*Superior(-)*	*Similar (=)*	*Inferior(-)*	
3	White	2010	$202,000	1967	1,304	12.78	Ranch	Metal Building/Shed	**Superior**
			Adjustments:	*Similar(=)*	*Inferior(+)*	*Similar(=)*	*Similar(=)*	*Superior(-)*	
4	Volga	2011	$204,000	1910	2,294	12.65	Story1/2	Barn/Shed/2car	**Superior**
			Adjustments:	*Similar(=)*	*Superior(-)*	*Similar(=)*	*Similar (=)*	*Superior(-)*	
5	Brookings	2010	$135,000	1974	1,288	7.5	Ranch	Shed/2Car	**Inferior**
			Adjustments:	*Similar(=)*	*Inferior(+)*	*Inferior(+)*	*Similar (=)*	*Inferior(+)*	

Sale Location Map:

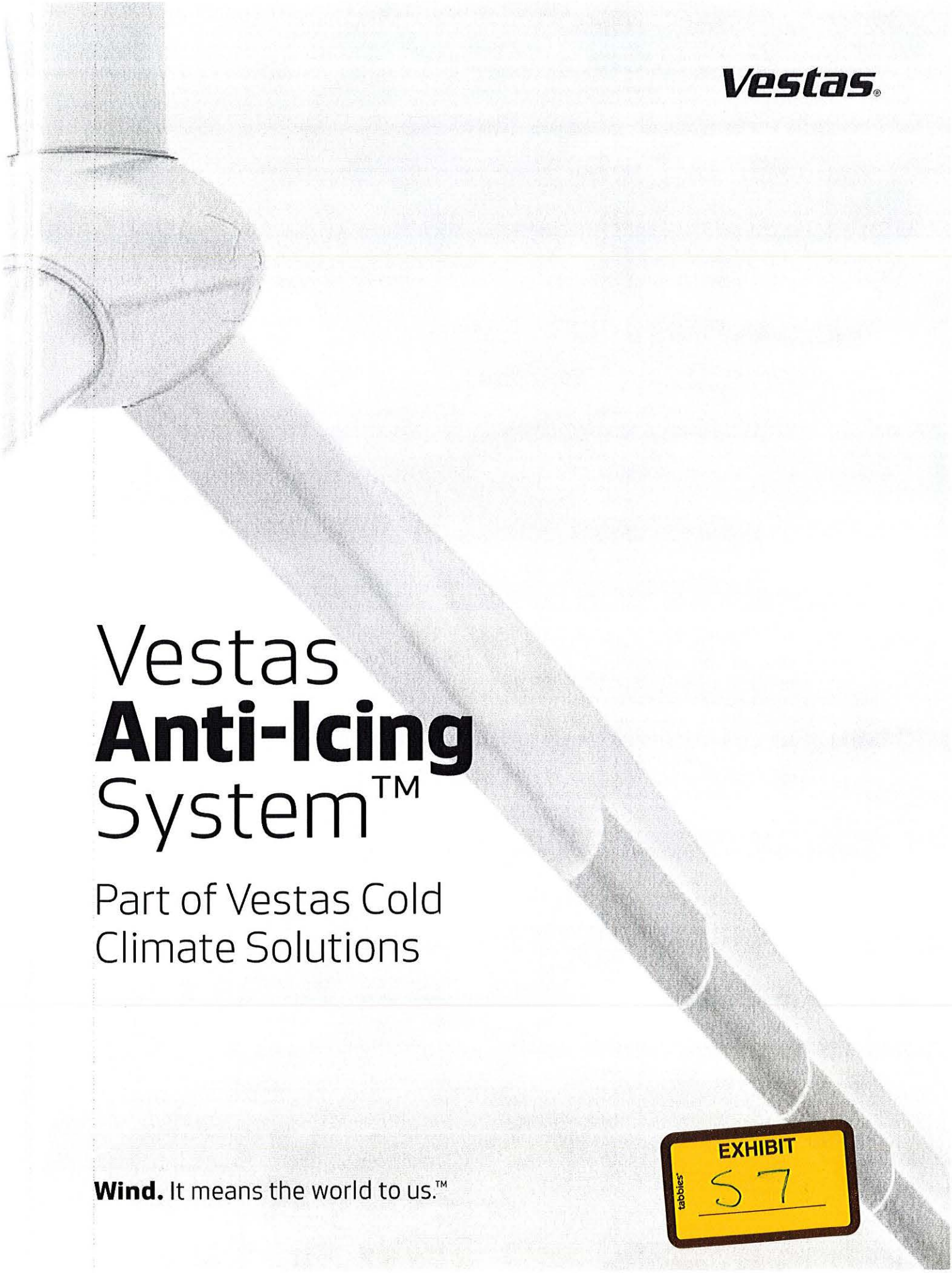


Legend	
1. 47005 225th St., Colman, SD 57017(09-595)	4. 46306 209TH ST, Volga, SD 57071(11-436)
2. 21935 461ST AVE, Volga, SD 57071(11-226)	5. 20456 469TH Ave, Brookings, SD 57006(09-581)
3. 20787 482ND AVE, White, SD 57276(10-599)	6. 47318 SD Highway 30, Brookings, SD 57006(10-430)

Market Sales Analysis Conclusion:	Six sales are utilized in the grid that is not influenced by the proximity of a wind tower. All sales share in highest and best use as a rural acreage and sold around the same time as BK7. After analyzing the elements of comparison, the market sales bracket the selling price of BK7 and suggest the selling price has not been negatively affected by the proximity of the wind tower.

Overall Conclusion:	An interview analysis, site observation, and sales analysis were completed for sale BK7. The market sales and buyer interview comments are consistent. The evidence suggests wind towers have not negatively impacted the selling price of BK7.

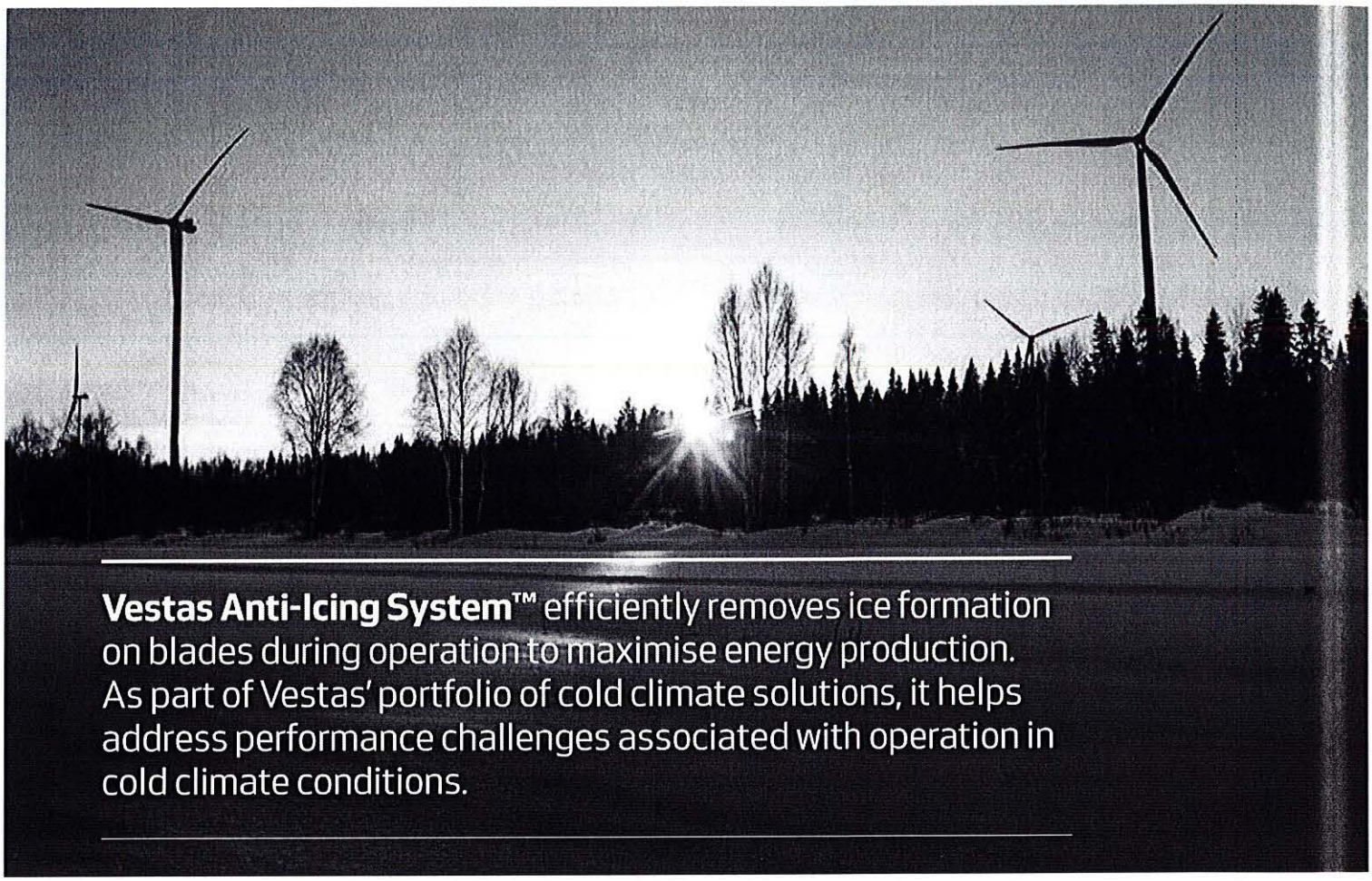
Vestas®



Vestas **Anti-Icing** System™

Part of Vestas Cold Climate Solutions

Wind. It means the world to us.™



Vestas Anti-Icing System™ efficiently removes ice formation on blades during operation to maximise energy production. As part of Vestas' portfolio of cold climate solutions, it helps address performance challenges associated with operation in cold climate conditions.

Targets icing where and when it's needed
Certain weather conditions result in ice building up on rotating turbine blades; this changes the blades' aerodynamic properties and negatively impacts energy production performance. Vestas Anti-Icing System™ continuously monitors the effects of ice formation and intelligently engages to remove ice and secure continued operation to maximise performance. The combination of several independent heating elements and levels result in targeted and effective anti-icing action tailored to the specific icing event. Targeting icing only where and when it is needed minimises the system's power consumption and maximises the effective climatic operating range.

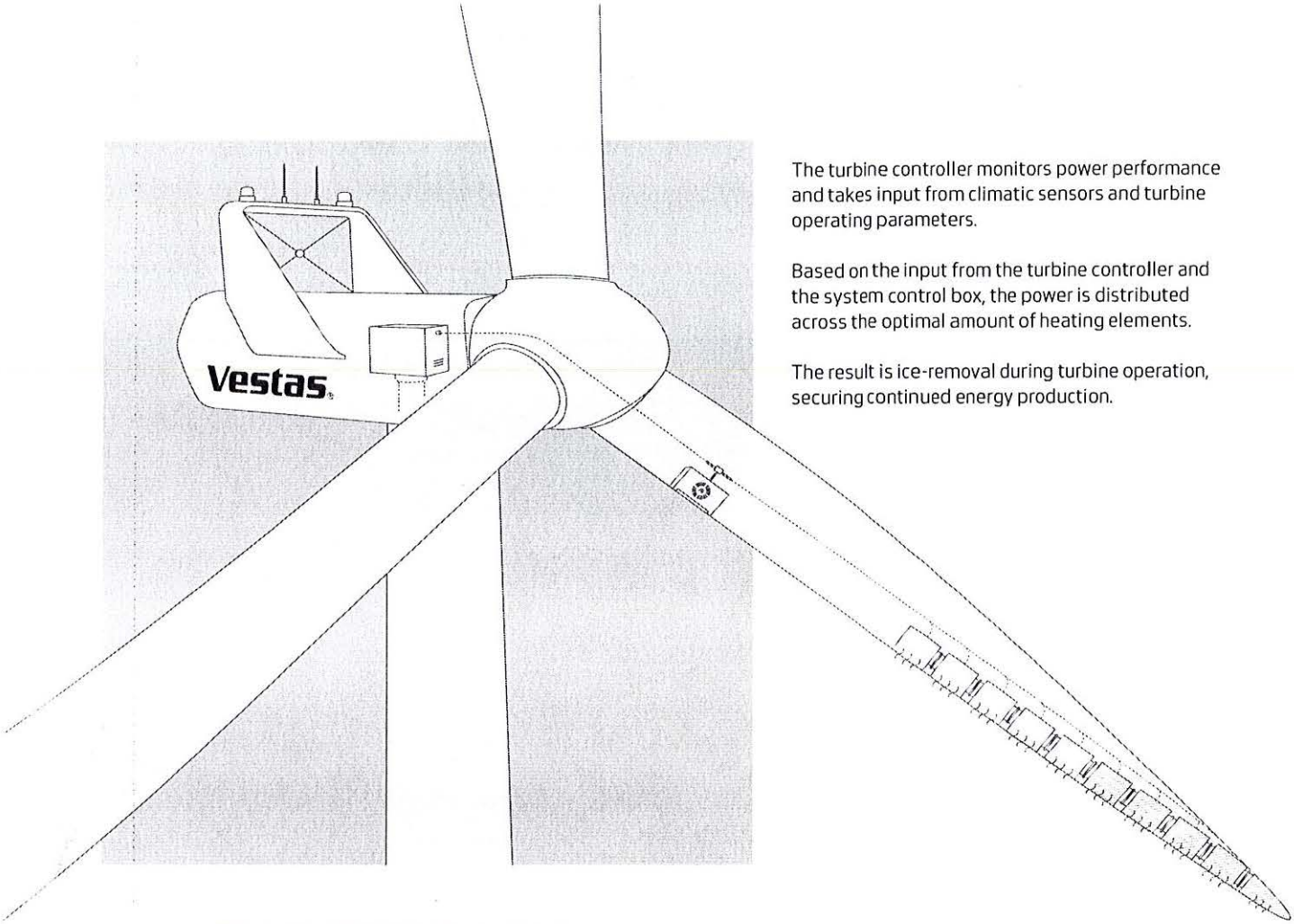
Rapid heating response
Covering a large area and embedded in the laminate directly below the blade's surface, the system has a fast response time. During the most common icing events, Vestas Anti-Icing System™ engages while the turbine is in operation and ensures a minimum of 90% production retention*. A large operational envelope secures high energy production in extreme cold climate conditions, making it the optimal cold climate solution for sites ranging from low to high ice severity.

Improved business case certainty
Vestas Anti-Icing System™ improves business case certainty by reducing lost production due to icing events, while minimizing risks. Vestas Anti-Icing System™ complies with the latest warranty guidelines**.

No stranger to cold climates and icing
Vestas Cold Climate Solutions build upon 16 years of experience within cold climates. With more than 4 GW of installations in ice prone sites***, Vestas has a strong track record and extensive experience with installing and servicing turbines in these harsh conditions.

Vestas Anti-Icing System™ is developed and optimised based on this experience and extensive performance data insights, gathered from thousands of turbines in cold climate sites. Vestas Anti-Icing System™ is designed and engineered by Vestas, specifically for Vestas blades and control systems.
Vestas Anti-Icing System™ is available for V136-4.2 MW™ and V150-4.2 MW™

Vestas Ice Assessment™
Vestas' wide suite of siting tools, including the improved Vestas Ice Assessment™, allow us to use highly advanced metrological models and algorithms to assess icing challenges. On a specific site, it predicts icing exposure for each individual turbine, with a precision of ~300 m. Vestas Ice Assessment™ can predict the specific icing conditions, ice formation on blades and expected icing loss to assess the total energy production of a cold climate site - and how icing events will affect the customer's business case. This means we ensure that only those turbines likely to be effected by moderate to severe icing events are installed with the Vestas Anti-Icing system™



The turbine controller monitors power performance and takes input from climatic sensors and turbine operating parameters.

Based on the input from the turbine controller and the system control box, the power is distributed across the optimal amount of heating elements.

The result is ice-removal during turbine operation, securing continued energy production.

Vestas Cold Climate Solutions

Low temperature

Vestas Low Temperature Option™

Primary concern: Health & Safety

Icing

Vestas Ice Assessment™

Primary concern: Maximising AEP

Vestas Ice Detection™

Vestas Anti-icing System™

Vestas De-icing™

Vestas Low Temperature Option™
Enabling turbine operation in ambient temperatures as low as -30°C, Vestas Low Temperature Option™ employs heating elements to ensure the continued operation of temperature-sensitive components.

Vestas Ice Detection™
The Vestas Ice Detection™ system detects ice build-up on turbine rotors and helps to limit the risk of ice throw. The Vestas Anti-Icing System™ and Vestas Ice Detection™ can be combined in safety regulated sites to reduce downtime caused by the risk of ice throw.

Vestas De-Icing™
Maximizing energy production in icy conditions, the Vestas De-Icing™ system uses air heaters to circulate hot air within the turbine blades during standstill. Available for V112-3.45 MW*, V117-3.45 MW* and V126-3.45 MW*

* Depending on siting and climatic conditions. The system retains 90% in climatic and operating conditions within the maximum performance operating envelope.
** IEA task 19 IPS warranty guideline
***Above IEA class II

Vestas Wind Systems A/S
Hedeager 42 . 8200 Aarhus N . Denmark
Tel: +45 9730 0000 . Fax: +45 9730 0001
vestas@vestas.com . vestas.com

01/2018 EN

Kristi Mogen's Testimony Exh. 1

EL18-003 - In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project

49-41B-22. Applicant's burden of proof. The applicant has the burden of proof to establish that:

(1) The proposed facility will comply with all applicable laws and rules;

(2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;

(3) The facility will not substantially impair the health, safety or welfare of the inhabitants; and

(4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

Source: SL 1977, ch 390, § 17; SL 1981, ch 340, § 3; SL 1991, ch 386, § 6.

My name is Kristi Mogen, I live at 15160 471st Ave, Twin Brooks, SD.

My education level is several college credits at Pima Community College in Tucson Az. I have been a reporter and columnist for the Tucson Citizen, worked in property management, community planning and licensed Realtor for many years prior to a serious livestock accident in 1996. Since then I have been a master gardener, won tri state range management competition, earned a farmer's market manager certification and helped organize local farmers markets, I worked at a local quilt store, and taught quilt classes in the Mid-West regions, and been active in 4H prior to moving to Eastern South Dakota from Wyoming. Currently, I farm with my family and designed a specialty ruler for quilters.

My largest concern is the health and safety of people and my family living and working around industrial zones in too close of proximity. There are hundreds of stories, Vicki May, Ted Hartke, David Janes to name a few who are being dismissed and sound just like what my family lived through in Wyoming. My family, husband and two daughters, lived on our farm when an energy company started fracking 2 miles from our home and eventually moved in closer. The noise and vibrations from the constant drilling 2 miles away shook the walls of our home and kept us up all night long. We described it as living on the Denver Airport Tarmac 24/7. I am very concerned that these 4.2 MW turbines off-shore size, larger than any others in South Dakota, will eventually be less than 2 miles from our new farm that was to be our promise land. We escaped the torture of sleep deprivation, constant stress and not being able to enjoy our rural property. I am not an expert on noise, have spoken at length with Richard James, read many studies and now understand how some of the impacts we lived with before affected us. My family's health declined within 8 months of when industry moved near our home. After 2.5 years of not being able to sell our home, we had to abandon a home that we put blood, sweat and tears into, where my children spent time growing up, and building community bonds. People just do not just abandon their homes, the cost are great, but for me and my family it became life or death. I do not want to see that for our new community.

Besides noise, there is flicker. My oldest daughter has epilepsy. It is her plan to take over our small farm. She has worked with livestock all her life and attends seminars on a regular basis to keep up with the best management farming conservation practices. The threat of flicker, on our property, or as she is driving down the road to go to vo-tech school is life threating to her. She has worked hard and given up many teen activities to remain seizure free. One of those activities is school dances, where there are colored and strobe lights. She has vertigo issues if someone flicks the lights on and off in the house or at school. My family must turn off the ceiling fans when she is in the room. Flicker on our property or public spaces that she must use to go to school or work will change her life forever. I have seen flicker, it is not a shadow slowly moving across your lawn, it is startling, like a strobe light and flicker should not be allowed on non-participating landowners property or public spaces.

As a former Realtor, I am concerned with the number of homes that are abandon, no sales or long sales. For many people, especially in rural areas, their home and property are their nest egg. Owning property, putting down roots, helps lift people out of poverty, increases financial stability, drops crime rates and improves health and support systems. When people must abandon their homes, take reduced sale prices or longer sales there are opportunities and resources lost. A family losing a home may never financially recover. By allowing Industry to impact people by not protecting property rights and thru trespass with noise, flicker, infrasound, vibration, air turbulence, electromagnetic fields or electrical or radio frequency interference, there will be serious consequences to the health, finances, and social fabric of rural South Dakota.

I am concerned that the Codington County and Grant County CUP's do not resemble the Dakota Range 1 & 2 application to the PUC. Included in that application is the decommissioning report that understates the cost of decommissioning by a wind industry representative at the April 16th, 2018 Codington County Planning and Zoning meeting stating decommissioning is $200,000 per turbine. In exhibits, I have provided testimony from Diane Redlin and Jon Meyer about other concerns as well as the minutes from Grant County Commissioners, March 20, 2018 when the commissioners decided not to send a letter of support for Dakota Range 1 & 2. I have seen wind contracts, I have had attorneys tell me they advise against signing a one-sided contract, I would like PUC to evaluate a landowner contract. To trust someone is the South Dakota way. Many states have put out documents and even made legislation to protect landowners from harmful wind contracts. I like to know what other things have been misrepresented.

I am concerned that Grant County and Codington Board of Adjustments approved the CUP based on out dated ordinances and were not given all the facts about impacts to the community from Industrial Wind Turbines. The public has just 10 days' notice, to figure out if this industrial project will fit with our rural agricultural community. I was skeptical, having experience with living in an industrial zone, but a quick google search said wind turbines are green (yeah, no fossil fuels) and free energy. Nothing about health or community impacts, nothing about the 300 gallons of oil each turbine takes, nothing about the high cost to taxpayers thru subsidies, nothing about wildlife impacts, nothing about the local climate change or driving soil moisture out of the ground (dirty thirty's). I only learned of these issues as I studied for the past year about impacts. Dakota Range 1 & 2 siting has some Industrial Wind Turbines too close to people, each turbine is a power plant, and that does not belong in someone's backyard.

Please protect the health, property rights and the unique rural South Dakota way of life. I ask that the PUC deny EL18-003, it is not right for rural South Dakota.

Respectfully,

Kristi Mogen

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY DAKOTA RANGE I, LLC AND DAKOTA RANGE II,LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN GRANT COUNTY AND CODINGTON COUNTY, SOUTH DAKOTA FOR THE RANGE WIND PROJECT	DIRECT TESTIMONY OF Teresa D. Kaaz EL18-003

Teresa D Kaaz, 15610 459th Ave South Shore, SD 57263
Direct testimony and attachments

Thank you all for giving me the opportunity to give my testimony.

I attended grade school at Grant-Deuel School, Revillo, SD attended Deuel High School, Clear Lake, SD, received GED and the attended LATI, Watertown, SD, took Banking and Finance.

In 2001 My Husband, Daniel Kaaz and I purchased 15.5 acres abandoned homestead and moved on our trailer house, from rural Watertown and also moved on a shop that his grandfather Karl Kaaz built. Years later we moved a 2 ½ story 1920 farmhouse on. We remodeled and restored it with new wiring, new windows, new roof, and all new plumbing. All we have left is finishing the basement and new siding which was scheduled for this spring but we put those renovations on hold.
If this application is approved these turbines could potentially be only 1000 feet from my house because of an outdated Codington county ordinance that was in affect when this CUP was approved. The towers proposed for this Wind facility are 4.2 mw Vestas and stand almost 500 feet tall. Turbines of this size have never been built in South Dakota before. I do not feel as if myself our any other person should be asked to live that close to these industrial turbines. Our view shed will be destroyed. The flicker day and night as we have clear view of sun rise and set and also moon rising and falling. I can look at the stars from our bedroom window and the red flashing lights will block that also. I spend my days at home so I will live with the constant noise 24 7. I don't feel as if I can afford to put any more money into my property as I will never get a return on investment. My property value will be devastated if not become completely unlivable. This is my home, our paw family is buried there. My husband and myself have grown up in this area all our lives and wanted to make this our forever home till we were too old to take care of it.
The current setback ordinance that this CUP granted by Codington county has taken away the full use of my property by trespass zoning. We will not be able to build a bigger shop, or put in a shelterbelt because the safety zone is 1640 feet so in case of a fire or brake failure the WES employees

are required to stay that far away until turbine is shut off. What am I suppose do, watch from my window or evacuate my home? It will effect the county economically as new families will not move into the area because there will be no land available that can be permitted to build.

A home buyer who wants to live in the country, they do so because of the peace and quiet, and the view. This will never be the same as previous generations have enjoyed. The current inhabitants will have sleepless nights due to the noise which their bodies will not get used to. Small towns will be unable to grow as they will not be able to increase their city limits.

Many small towns are not even able to build over two story buildings when surrounded by leased land owners industrial wind systems.

On April 17th 2018 just before sunset I took the pictures of a family of eagles feeding on a deer carcass in the right of way on highway which are included in attachments right outside to the north of Stockholm, SD about 1/8 mile from Stockholm sign. The second set of pictures titled, eagle Hamanns, was taken 3 22 2018 one and one half mile to the east of me at the Gary Hamann, address 46058 SD Hwy 20, South Shore, SD, residence in their shelterbelt. There location is in the footprint as application as well. This is why in first data request I have asked for new rapture study be completed. It has been our largest achievement we have done for ourselves and our family.

We have dedicated the past few years to improve our property. Our county tax rates have increased due to the improvements made. Our entire family has helped us through this project with long hours and dedication to make it our dream home. That could be all gone with an outdated ordinance in place at our county level.

We have met many new people through this process. It has been incredibly heartbreaking to see families give up their savings because they have to fight for their property rights. Others have made the decision to move away. But our family is here and we never had any intentions to move away from this area. We all understand the concept of renewable energy, but did not ever imagine that that was going to include loosig property values and rights.

In previous studies I have not seen a study which includes abandoned farm sights caused by wind turbine sittings. That would a give a more correct study of how WES effect property values and communities.