Ex. A21

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY DEUEL HARVEST WIND ENERGY LLC FOR ENERGY FACILITY PERMITS OF A WIND ENERGY FACILITY AND A 345-KV TRANSMISSION LINE IN DEUEL COUNTY, SOUTH DAKOTA FOR THE DEUEL HARVEST NORTH WIND FARM

SD PUC DOCKET EL18-053

PRE-FILED REBUTTAL TESTIMONY OF BENJAMIN DOYLE
ON BEHALF OF DEUEL HARVEST WIND ENERGY LLC

April 1, 2019

I. INTRODUCTION & BACKGROUND

Q. Please state your name, employer, and business address.

A. My name is Benjamin Doyle. I am the president and owner of Capitol Airspace Group, LLC ("Capitol Airspace"), 5400 Shawnee Road, Suite 304, Alexandria, Virginia 22312.

A. Capitol Airspace is an aviation consulting firm with expertise in air traffic operations, airspace and obstacle evaluation. Capitol Airspace has 16 full-time employees and three part-time contractors. Ten of our employees/contractors are former pilots, air traffic controllers or aviation degreed professionals. We have technical staff with advanced degrees in Geographical Information Systems with experience working in commercial, civilian government and military roles. With this core group of people, Capitol Airspace provides analytical and advocacy services to clients in the energy, real estate and telecommunications industries. Over the past 20 years, my staff and I have managed in excess of 1,500 airspace projects and submitted nearly 49,000 filings to the Federal Aviation Administration ("FAA"). As the president of Capitol Airspace, I have final responsibility for all aspects of the business conducted by the company.

Q. Please describe your professional and educational background.

A. Prior to founding Capitol Airspace in 2010, I was the Vice President of Airspace and Obstacle Evaluation for JDA Aviation Technology Solutions, and, before that time, I was the Director of Airspace Analysis for Aviation Management Associates, Inc. In this position, I developed and designed airspace/terminal instrument procedures modeling tools, conducted airspace studies and developed mitigation solutions on behalf of company clients. Prior to joining Aviation Management in 1999, I was a member of the United States Army where I served as an air traffic controller. I held tower ratings at Libby Army Airfield, Ft. Huachuca, Arizona and Wiesbaden Air Base in Wiesbaden, Germany where I served as the Air Traffic Control Tower Chief. This

is my 25th year working in aviation and my 20th year specifically working airspace and obstacle evaluation.

I have an Associates of Arts Degree from Cochise College and am a graduate of the US Army Air Traffic Control School. A copy of my statement of qualifications is included as Exhibit 1.

Q. What is your familiarity with the Deuel Harvest North Wind Farm ("Project")?

A. Deuel Harvest Wind Energy LLC ("Deuel Harvest") retained Capitol Airspace to conduct an evaluation of airspace in the vicinity of the Project.

Q. Have you previously provided testimony in this docket?

A. No.

II. PURPOSE OF TESTIMONY

Q. What is the purpose of your Rebuttal Testimony?

A. The purpose of my Rebuttal Testimony is to discuss the airspace analysis Capitol Airspace conducted for the Project, describe aviation regulations in the United States, and respond to the testimonies of Jon Thurber and Garrett Homan concerning the Homan Field Airport (00SD).

Q. What exhibits are attached to your Rebuttal Testimony?

A. The following exhibits are attached to my Rebuttal Testimony:

- Exhibit 1: Statement of Qualifications
- Exhibit 2: Capitol Airspace Group Obstruction Evaluation and Airspace Analysis dated March 26, 2019

III. FEDERAL & STATE AVIATION REGULATIONS

Q. Please provide an overview of federal aviation regulations that apply to proposed structures.

A. Chapter 49, Section 44718 of the United States Code ("USC") establishes the legal authority through which proponents of planned structures are obligated to notify the Secretary of Transportation (delegated to the FAA), and the authority for the Secretary to conduct Aeronautical Studies. The purpose of the statute is to promote safety in air commerce, and to ensure the efficient use and preservation of navigable airspace and of airport traffic capacity at public-use airports. In the last few years, the codified law has been expanded by Congress to include protections for national security.

49 USC 44718 establishes the responsibility of and grants authority to the Secretary of Transportation to conduct aeronautical studies in very general terms. Title 14 of the Code of Federal Regulations ("CFR"), Part 77 provides additional details and criterion for notification of proposed structures and establishes the imaginary surfaces used to differentiate obstacles from non-obstacles.

Various FAA Orders and Advisory Circulars further define the aeronautical study process and the criterion through which the FAA differentiates structures that are hazardous to air navigation from those that are not.

Q. Does the FAA grant airspace rights to private airports?

A. No. As noted in the determination for Homan Airport (00SD), "[t]he FAA cannot prevent the construction of structures near an airport. The airport environs can only be protected through such means as local zoning ordinances, acquisitions of property in fee title or aviation easements, letters of agreement, or other means." This language is also found in JO 7400.2 Chapter 12. Airport Determinations, 12-1-5 Statement in Determinations. That said, the determinations issued by the FAA are used by local and state zoning authorities as the authoritative basis when deciding whether to issue permits.

Q. Does the FAA regulate private airstrips?

A. The FAA loosely regulates private airstrips. Under the provisions of 14 CFR Part 157, persons requesting to establish a private airfield must submit notice to the FAA. The FAA conducts an airspace analysis of the proposed private-use airport and, if approved, issues a Notice of Airport Airspace Determination. In order to make the determination, the FAA considers the effects the proposed airport would have on existing or planned traffic patterns of neighboring airports, the existing airspace, and projected programs of the FAA; the effects on the safety of persons and property on the ground; and the effects that existing or proposed manmade objects (on file with the FAA) and known natural objects within the affected area would have on the airport proposal.

Once the Conditional No Objection has been received, the private airport owner has the option to request that the FAA include the airport on aviation charts. Additionally, there is an obligation to notify the FAA when construction of the airport has commenced.

Additional stipulations are listed in the "Conditional No Objection" notice for the private airport that stipulates that all operators of the airport proceed at their own risk and that the proponent must meet all state and local requirements. Additionally, the FAA recommends that: 1) All operations are conducted in visual flight rules ("VFR") weather conditions; 2) The landing area is limited to private-use only; 3) A non-obstructing wind indicator is maintained adjacent to the takeoff/landing area; 4) No night operations are conducted unless the runway and wind indicator are lit; and 5) No terrain or obstacles penetrate the 20:1 visual approach/departure surfaces. Per 14 CFR Part 157, any construction, alteration to or abandonment of the subject airport requires notice to the FAA. The FAA further recommends that the airport be constructed to the standards identified in FAA Advisory Circular 150/5300-13 Airport Design (current version).

Provided that the aforementioned conditions are met, the FAA's aeronautical study determines that the proposed private-use airport will not adversely affect the safe and efficient use of the navigable airspace by aircraft.

Q. Does the FAA consider aviation safety as part of its Determination of No Hazard process?

A. Yes. According to the FAA JO 7400.2M, Paragraph 5-1-3: "The prime objective of the FAA in administering Section 44718 and 14 CFR Part 77 in conducting aeronautical studies is to ensure the safety of air navigation and efficient utilization of navigable airspace by aircraft."

Q. Does the FAA consider private-use airports during the aeronautical study of planned structures?

A. Yes. The FAA considers the impact of planned structures on FAA approved instrument approach procedures at private-use airports. In the case of a private-use airport with an FAA approved instrument approach procedure, the FAA will protect the horizontal and vertical obstacle evaluation and clearance surfaces that protect aircraft using the procedure. Private-use airports, such as Homan Field Airport, that do not have one or more FAA approved instrument approach procedures are not afforded protections under 14 CFR Part 77, and therefore are not considered during an aeronautical study.

Q. Please describe the steps a private airstrip would need to take to become a public airport.

A. To my knowledge, the airport proponent would need to submit a request to the FAA Airport District Office to become a public-use airport.

Advisory Circular 150/5300-13A - *Airport Design* would have to be adhered to. It contains the FAA standards and recommendations for the geometric layout and engineering design of runways, taxiways, aprons, and other facilities at civil airports.

Additionally, 14 CFR Part 139 *Certification of Airports*, provides the requirements to become a public-use airport. Part 139 typically does not apply to general aviation airports because they do not serve the air carrier operations specified in the authorizing statute and the revised regulation. Part 139 does, however, contain many safety procedures and practices FAA recommends for use at all airports. This includes requirements for inspections and certificates for the airport operator.

Q. Are you familiar with South Dakota aviation laws or regulations?

A. Generally, yes. I am not an expert in South Dakota law, but I have reviewed the sections pertaining to private airports.

Q. Do South Dakota aviation laws or regulations grant a private airstrip owner airspace rights over neighboring land?

A. No. Per South Dakota Codified Law Chapter 50, Section 13-3 Ownership of Airspace, the ownership of the space above the lands and waters of the state is declared to be vested in the several owners of the surface beneath, subject to the right of flight described in Section 50-13-4. Specifically, Section 50-13-4 states that it is illegal for a pilot to operate an aircraft at "low altitude as to interfere with the then existing use to which the land or water, or the space over the land or water, is put by the owner." This clearly vests the rights to airspace over a private citizen's land solely in the landowner. A neighboring private airport owner may only utilize that airspace when flight is conducted in a safe manner given the land's use at the time of flight.

IV. PROJECT AIRSPACE ANALYSIS

Q. Please describe the purpose of the airspace analysis conducted by Capitol Airspace for the Project.

A. Capitol Airspace conducts Obstruction Evaluation and Airspace Analyses ("OE Studies") for development firms in order to understand the height constraints in the area of planned development. The FAA does not publish maps depicting height

limits around airports. Instead, it publishes criterion through which height limits are calculated. This criterion is contained in numerous FAA Orders and Advisory circulars and is voluminous. Capitol Airspace replicates the FAA's aeronautical study process by using the same criterion used by the FAA for determining whether a structure is a hazard to air navigation or not. Companies commission these studies because Capitol Airspace can provide these studies and associated height constraint maps in a matter of weeks while the FAA may take up to a year to render a decision.

While Capitol Airspace's reports cannot be used as a basis for permitting and certainly do not replace the FAA's determination, its reports are valuable to developers in identifying risk early in the development timeline. Developers often use these studies when siting wind turbine locations, and to validate or invalidate FAA preliminary findings.

Specific to the Project, the OE Study was conducted so that I would have an understanding of the airspace and the associated height constraints in the vicinity of the Project. Further, it provides context in the discussion of perceived impacts to Homan Field Airport.

Q. Discuss the results of the OE Study.

A. Capitol Airspace's OE Study assessed impacts to public-use, military and private-use airports with at least one FAA approved instrument approach procedure. The OE Study considered impacts of the planned Project on visual and instrument flight operations. The study assessed potential impacts to instrument approach and departure procedures, VFR traffic patterns, VFR routes, en-route airways, minimum vectoring altitudes, minimum IFR altitudes, terminal and en-route NAVAIDS, and military airspace and training routes. The analysis concluded that, "At 499 feet AGL, proposed wind turbines will not exceed 14 CFR Part 77.17(a)(1), 77.17(a)(2), or 77.19/21/19 imaginary surfaces.

Q. Does Capitol Airspace recommend any changes to the Project's proposed layout as a result of the OE Study?

A. No. The turbines, as proposed, would not have an adverse aeronautical effect.

V. RESPONSE TO JON THURBER

Q. On pages 16-17 of his testimony, Mr. Thurber states that FAA order JO 7400.2L and 14 C.F.R. Part 77 (sic) are not applicable to private-use airports. Do you agree?

A. Yes. I do agree with Mr. Thurber's assessment. 14 CFR Part 77 clearly defines which types of airports are afforded airspace protections. Private-use airports without an FAA approved instrument approach procedure are not included.

Q. On page 17 of his testimony, Mr. Thurber refers to a repealed Oklahoma statute concerning setbacks for private airstrips. Are you familiar with this statute?

A. I am generally aware of the Oklahoma statute and its repeal. I understand that Oklahoma created statutes with the intent to protect airports from encroachment by tall structures. After the law went into effect, the state experienced a marked increase in private-use airport applications. The law was subsequently amended to exclude private-use airports but retained setbacks for public-use airports. I believe that land owners were using the law to prevent wind projects without any intent to use their "airports" for aviation activities. As I understand it, since this was not the intent of the law, it was amended. An article in *The Oklahoman* published on May 22, 2016 describes the misuse of the statute.[1] The Oklahoma Legislature changed the law in April 2017.

VI. RESPONSE TO GARRETT HOMAN

[1] https://newsok.com/article/5499575/oklahoma-landowners-register-private-airstrips-to-keep-wind-farms-at-bay?

Q. Overall, Mr. Homan asserts that the "wind turbines sited in close proximity to the airstrip [ ] will create significant risks to my life and the lives of my family, friends, and any other pilots that use the airstrip" (page 2). What is your response?

A. Mr. Homan has determined that the proposed wind turbines are going to pose a significant risk to him and his family and friends flying into and out of Homan Field Airport. According to his testimony, he believes this to be true based on independent studies of wind shear from wind turbines and the location of a single wind turbine within a traffic pattern area that he perceives should be protected. His personal conclusion that the wind turbines are a safety hazard is contrary to the findings of the premier authority in the world on aviation safety: the FAA. Over the past 90 years, the FAA and its predecessors have been regulating air safety in the United States. The development of these regulatory standards is a product of decades of data analysis that led to the development of safety cases that ultimately became the regulatory policy that we use today. To that end, the FAA has an entire division called Flight Standards that is responsible for the development of safety standards. There are thousands of aviation professionals, pilots, air traffic controllers and engineers that have contributed to the development of these standards. Their collective effort has made the United States National Airspace System the busiest and safest place to fly in the world. Mr. Homan's claim that he is at risk flying into Homan Field Airport assumes that the FAA's safety standards are lacking and not sufficient to protect him and his family. I do not agree.

Q. On page 4 of his testimony, Mr. Homan describes the traffic pattern airspace required to use the Homan airstrip. Can you summarize this discussion in layman's terms?

A. The FAA has regulatory guidelines that protect aircraft flying into and out of public-use airports under VFR. Mr. Homan, in his testimony, asserts that these VFR traffic patterns should be applied to Homan Field Airport. As stated earlier, the FAA does not apply these protections to private-use airports.

Q. Do you agree with Mr. Homan's description of the traffic pattern airspace requirements for the Homan airstrip?

A. No. There is no traffic pattern airspace requirement applied to private-use airports.

Q. Mr. Homan attaches "SMS Report No. 1101, Aviation Safety-risk Assessment of the Effect of Wind Turbines on General Aviation Aircraft" to his testimony. Is this document relevant to the discussion of Homan Field Airport?

A. Absent a review by FAA's Flight Standards office and inclusion in the FAA regulatory guidelines, the findings of this report are solely academic and not regulatory in nature and therefore not applicable.

Q. Mr. Homan states that Deuel Harvest has not adequately addressed potential impacts on Clear Lake Airport (page 8). What is your response?

A. It is not clear to me what Deuel Harvest would be expected to do regarding the Clear Lake Airport. FAA's aeronautical study has concluded that the turbines would not be a hazard to air navigation. In his testimony, Mr. Homan contends that the FAA failed to consider the impact of wake turbulence from the wind farm on Clear Lake Airport. As I stated earlier, the FAA (the regulator and expert on these issues) does not consider wake turbulence in its aeronautical study. The FAA does consider all airspace impacts for public-use airports and found that there were no impacts to Clear Lake Airport.

Q. Mr. Homan states that Deuel Harvest has not adequately addressed electro-magnetic interference effects on aviation communication and navigation systems (page 8). What is your response?

A. Again, the FAA aeronautical study assessed for impacts to communications, navigation, and surveillance systems used by the FAA, Department of Defense, and Department of Homeland Security. Engineers in two different FAA offices, Technical Operations and Frequency Management, assessed the wind turbines for interference. Had electromagnetic interference ("EMI") been identified as a concern,

it would have been addressed and documented in the FAA's Determination of No Hazard issued for the wind turbines.

Q. Mr. Homan states that Deuel Harvest has not adequately addressed how the Project will affect "the receipt of VOR navigation aids in the area" (page 8). What is your response?

A. VHF Omnidirectional Range ("VOR") impacts are screened by FAA Technical Operations per my comments above. Had impacts been identified, EMI would have been addressed and documented in the Final Determination of No Hazard.

Per Capitol Airspace's OE Study, the nearest VOR is greater than eight nautical miles away from the wind farm and therefore greater than the distance used by the FAA to protect for EMI to a VOR.

Q. Mr. Homan also submitted testimony from Mr. Kevin Elwood. Have you reviewed this testimony and related documents (together, "Elwood Documents")?

A. No. I don't believe that it is relevant as it is outside the purview of U.S. aviation regulations.

Q. In his response to Staff Data Request ("DR") 2-1, Mr. Homan asserts that "FAA regulations, orders, and guidance materials . . . constitute the de facto standards. . . ." Do you agree?

A. No. The standards are applied as directed in the regulatory guidelines to public-use airports and private-use airports with FAA approved instrument procedures.

Q. In his response to Staff DR 2-8, Mr. Homan provided a "Notice of Airport Airspace Analysis Determination" ("FAA Notice"). Please explain what this document is.

A. This document is the FAA's determination that the Homan Field Airport will not interfere with other airports. It also provides stipulations and recommendations

regarding improved safety at the airport. Please see my response above regarding the FAA regulation of private-use airports.

Q. Had the Project been constructed at the time that the FAA conducted its aeronautical study of the Homan Field Airport, in your opinion, would the results of the FAA's aeronautical study of the airport be different?

A. No. Since the FAA does not apply 14 CFR Part 77 protections to private-use airports without FAA-approved instrument approach procedures and focuses its review on the interference that the proposed airport may have on airspace and neighboring public-use airports, the existence of the wind farm would have had no impact on the FAA's findings. That said, the FAA would have assessed for the 20:1 approach surfaces referenced in the Conditional No Objection letter issued to John Homan. As stated earlier, none of the proposed turbines penetrate the 20:1 surfaces for Homan Field Airport and therefore would not have been deemed to have an impact on the airport. Even if they did, it would be Mr. Homan's responsibility to acquire any property rights needed to secure the 20:1 surfaces for his private use.

Q. Does the FAA Notice provide Mr. Homan with airspace rights for his airstrip?

A. No. See earlier responses regarding this issue.

VII. CONCLUSION

Q. Does this conclude your Rebuttal Testimony?

A. Yes.

Dated this 1st day of April, 2019.

Benjamin Doyle

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